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How digital technology transforms consumption: a critical reflection on theoretical lenses and a research agenda

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ABSTRACT

This conceptual paper reflects upon interpretive consumer and marketing researchers' efforts to theorise digital technology's capacity to change consumption. We assess the ability of established (practice and relational material perspectives) and emerging theoretical lenses (affordances, postphenomenology, sociotechnical imaginaries, and techno-animism) to capture how digital technologies transform consumption at micro (individual practices and their meanings), meso (the actors and institutions involved) and macro (market systems) levels. In an era of accelerated technological advancements where change may outpace our ability to understand it, this exercise is timely and necessary. It draws attention to how different theoretical lenses shape the aspects of transformation that research represents, foregrounding specific elements while obscuring others. By inviting researchers to reflect on change through the critical application of these lenses, we offer a research agenda for expanding our understanding of the implications of digital technologies for consumption.

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Introduction

Digital technologies are transforming how and what we consume, along with the broader systems in which we consume. For example, once cherished as inalienable, movie and music collections are now streamed, with algorithms curating what we watch and listen to. We shop online from global marketplaces based on personalised recommendations from influencers and bots, then use more bots when we need support. Alternatively, we use online subscriptions to access things we used to own whilst aspects of life that were once outside the market, such as finding a romantic partner, are routinely delegated to apps potentially changing what relationships mean. Other consumption tasks are increasingly automated, from thermostats that predict household temperature requirements,

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and robot vacuums that undertake cleaning, to AI that plans weakly menus, exercise regimes and whole travel itineraries. Such transformations can be understood as an often-contested "process of change that involves the alternation of fundamental attributes of a system" at individual (micro), institutional (meso) or societal (macro) level (Brown et al., 2013, p. 101). This demands new knowledge and interpretive consumer and marketing researchers have come to address this need through two broad approaches: practice theory, and ideas from relational material theories. These lenses have been particularly generative as they foreground the role nonhuman components- a blog, an algorithm, a platform, a device- have in consumption allowing diligent tracing of associations and ruptures happening within networks, configurations and assemblages via which transformation happens. Yet, as AI-enabled technology becomes more responsive, autonomous and human-like in what it does and what it represents, their explanatory power is challenged.

For starters, at the micro level of individual experiences, both have bypassed the attribution of human-like qualities to technology and the consequences of this. At meso and macro levels, power dynamics animating transformative processes and their outcomes have been generally sidestepped. Therefore, deliberate reflection of how established lenses have been used and diversification in our thinking tools is now necessary so that emerging changes spurred by contemporary digital technologies can be better understood. This is urgent given the pace and significance of technological change, with AI posing an existential threat to established consumption and consumer categories (Thompson, 2024). To illustrate, advances in machine learning are enabling consumption requiring little human input, with concerns being raised about growing dependency and addiction to technology, erosion of consumer agency and wellbeing (Puntoni & Wertenbroch, 2024; Valenzuela et al., 2024). Conversely, AI's ability to mimic human capabilities and expression is transforming robots into human-like entities, while consumers are undergoing biomechanical changes to become more cyborg-like (Belk et al., 2020). At a societal level, alarm is rising over the datafication of consumption and the commodification of human life itself (Caliandro et al., 2024), the growth in inequality and exploitation of consumers (Airoldi & Rokka, 2022; Scaraboto & Fischer, 2024), and environmental degradation propelled by contradictions of non-material consumption involving fewer physical things, but instead massive datacentres (Mardon et al., 2023).

Our aim is therefore to prompt critical reflection on how enabling theoretical lenses simultaneously sensitise and desensitise researchers to certain aspects of digital transformation by enabling different modes of thinking, research agendas and methodological interventions that require trade-offs and inherent problems in their translation from other domains of knowledge to marketing (Belk & Sobh, 2019; Belk et al., 2019; Franco et al., 2022). While the use of enabling theories is particularly prevalent among interpretive researchers charting consumption's digital transformations (e.g. Arsel & Bean, 2013; Horppu & Närvänen, 2024; Kozinets et al., 2021), there has not yet been a concerted effort to reflect on how such lenses shape our knowledge in this area such that it is easy to take a lens for granted as the only or best way to approach knowledge construction. We therefore appraise the scope of two established lenses (practice theory and relational material perspectives) and four emerging ones (affordances, postphenomenology, socio-technical imaginaries, hereafter STIs, and techno-animism) in the spirit of evaluating existing interpretive work and stimulating further research. Our objectives are fourfold:

(1) to capture how transformation is theorised across established and emergent theoretical lenses; (2) to consider how reliance on established theoretical lenses has shaped the ways transformation has been studied; (3) to evaluate the strengths and limitations of each perspective within interpretive marketing and consumer research; and (4) to outline a future research agenda to extend understanding of how digital technology transforms consumption.

In meeting these objectives, we make three contributions based on standards specified by MacInnis (2011) for conceptual work. First, we deliver a *delineating contribution* by showing relationships between each lens and dimensions of digital transformation that studies informed by them capture. Second, we offer a *summarising contribution* by outlining the advantages and limitations of each lens, along with their theoretical foundations, preferred methods, state-of-the-art developments, and research priorities. Third, we present an *advocating contribution* by encouraging researchers to discern the influence of enabling theoretical lenses in shaping claims of how digitalisation is transforming consumption. For qualitative researchers studying the digitalisation of consumption this provides an entry point, presenting succinct explanations of key enabling lenses to inform theoretical and methodological choices. This can also assist scholars who wish to contribute to knowledge by employing these lenses in an enabling or enfolding manner, whether by assessing their explanatory power in accounting for transformation or improving its power via adaptations and modification (Belk et al., 2019). Additionally, the paper aids researchers pursuing adjunctive approaches by allowing them to draw on these resources to broaden and strengthen their own theoretical developments (Belk & Sobh, 2019).

The paper is divided into three parts. First, we present procedures followed in the identification and analysis of texts. Second, we reflect on established theoretical lenses by highlighting how they have informed knowledge production, noting their focus and limitations. Third, we introduce and discuss emerging lenses and illustrate how they can shape future research in ways that can expand our understanding of how digital technology transforms consumption. We conclude with critical reflections.

Procedures

The research team consists of six established scholars working at the intersection of digital technology and consumption. Following prior analyses of enabling theorising in qualitative research (Arnould & Thompson, 2005; Dolbec et al., 2021), the team established a consensus around the theories to be included. This was achieved through a series of discussions based on experiences of writing and reviewing work in this area and involved suggestions of papers and approaches by each author, including their use of theory and specific contexts and contributions. Exemplar papers for established lenses were identified based on: (1) the authors' existing knowledge of key texts, and (2) a Google Scholar search aimed at identifying other relevant interpretive studies within the fields of consumer research and marketing. Adhering to conventions for this type of analysis (Arnould & Thompson, 2005; Dolbec et al., 2021), we purposefully selected papers representing different approaches within each lens. As this is not a systematic review, we selected papers that illustrate different methodological approaches and contributions, i.e. we looked for scope and variety in the selection rather than patterns and commonalities.

Key was that selected papers had something to say about how an aspect of consumption had changed due to digitalisation. We then searched for work adopting alternative, emerging theoretical lenses that had potential to reveal aspects of transformation that may be overlooked by established lenses. This led to the identification of four emerging lenses that the authors agreed could enable promising new contributions: affordances, postphenomenology, STIs, and techno-animism. These were selected because they offer alternative perspectives, especially related to levels or objects of analysis, or assumptions about relationships between consumers, markets, or society and the potentially transformative capacity of digital technology. Specifically, the recent interest in affordances within consumer and marketing research reflects its ability to capture technological transformations at a more granular level, shifting the unit of analysis towards the action possibilities embedded in sociotechnical infrastructures while maintaining a focus on human interpretation. Unlike practice theory and relational material theories that reduce technology to nodes within a network or a given practice, postphenomenology puts forth a novel conceptualisation of digital technology as a mediator of human-world relations, facilitating the analysis of hermeneutical changes. STIs, given their emphasis on how collectively shared visions of the future shape the development of new digital technology, their regulation and marketing, can further expand the scope of investigation to include a plethora of stakeholders not generally accounted for. Lastly, techno-animism, on the other hand, is a promising but little-used lens that lends itself to the study of emerging relationships between consumers and technological forms like AI and robots (see Table 1).

To attain greater clarity regarding what aspects of digital technology's transformative potential each lens captures, we scrutinised how each has been employed to research transformations at micro, meso and macro levels. Adhering to commonly held definitions in the social sciences, the micro level refers to the individual and to small-scale interactions. The meso level pertains to larger groups, families, communities and institutions, and deals with the normative structures and patterns of interactions emerging within these entities. Lastly, the macro level encompasses larger-scale structures including culture, the economy, legislation, politics, markets and society. These levels apprehend how digital technology transforms consumption reported in the sampled papers in accessible ways that aid comparison. To illustrate, we observed transformations being claimed in individual practices and meaning (micro) (e.g. Hagberg & Kjellberg, 2017); changes in organisations, communities, and platforms (meso) (e.g. Arsel & Bean, 2013); market systems, society and culture (macro) (e.g. Horppu & Närvänen, 2024); and at multiple levels (e.g. Weijo et al., 2018). We adopted micro-meso-macro distinctions in a diagnostic way for three key reasons. First, it shows how different theories used have prioritised analysis at a given level or levels. Second, it facilitates comparison of strengths and limitations, so that opportunities for further research can be identified. Third, the triage helps differentiate the transformations claimed and affords a clearer appreciation of how transformation is said to happen and its consequences. This is of particular importance within a context where claims of radical change are routinely made.

For each lens, we synthesised how transformation is theorised, drawing on foundational literature, the levels of transformation captured in interpretive work, commonly used methods, and strengths and limitations in applied studies and more broadly. For the emerging lenses that have received less attention in marketing and consumer research, we also draw from applications in other fields to clarify the lenses' potential to extend our

Table 1. Sample of exemplar papers.

	Theoretical lens(es) applied						Level(s) of transformation captured		
	Practice Theory	Relational material perspectives	Affordances	Postphen-omenology	Socio-technical imaginaries	Techno-animism	Micro	Meso	Macro
Arsel and Bean (2013)	✓							✓	
Denegri-Knott et al. (2022)	✓		✓				✓		
Fuentes and Svingstedt (2017)	✓						✓		
Feiereisen et al. (2019)	✓						✓		
Hartmann et al. (2015)	✓							✓	
Leban et al. (2020)	✓							✓	
Hagberg and Kjellberg (2017)	✓						✓		
Magaudda (2011)	✓						✓		
Pantzar and Ruckenstein (2015)	✓								✓
Scaraboto and Fischer (2024)	✓							✓	✓
Schau et al. (2009)	✓							✓	
Denegri-Knott and Molesworth (2013)	✓	✓					✓		
Franco et al. (2024)		✓					✓	✓	✓
Fuentes and Sörum (2019)		✓					✓	✓	
Haynes and Hietanen (2023)		✓							✓
Schneider-Kamp (2024)		✓					✓	✓	✓
Schöps et al. (2022)		✓					✓		✓
Watkins et al. (2016)		✓					✓	✓	
Weijo et al. (2018)		✓					✓	✓	✓
Caliandro and Anselmi (2021)			✓					✓	✓
R. V. Kozinets et al. (2021)			✓					✓	
Mardon et al. (2023)			✓	✓			✓	✓	
Ottlewski et al. (2024)			✓					✓	✓
Lianidis et al. (2024)				✓					✓
Robert-Demontrond (2022)				✓			✓		

(*Continued*)

Table 1. (Continued).

	Theoretical lens(es) applied						Level(s) of transformation captured		
	Practice Theory	Relational material perspectives	Affordances	Postphen-omenology	Socio-technical imaginaries	Techno-animism	Micro	Meso	Macro
Horppu and Närvänen (2024)					✓				✓
Preece et al. (2022)					✓			✓	
Sörum and Fuentes (2022)					✓		✓		
Belk et al. (2020)						✓			✓

knowledge of how digital technology transforms consumption. Recognising that boundaries between perspectives are porous, with different perspectives often brought together (as shown in Table 1), we discuss contributions based on the core lenses used, for ease of explanation, but we appreciate that each lens is subject to significant variation within its broad intent that cannot be captured in our review.

Our review is necessarily selective. We acknowledge that creative use of any of these theoretical approaches could be applied to any level, or to collapsing them, and that our summary overview of strengths and limitations could (and possibly has been) developed and/or overcome in other fields. Each section should therefore be read in the context of the overall aim of the paper to capture approaches and present options and ideas to further develop our understanding of how digital technologies are transforming consumption.

Established theoretical lenses

In this section, we reflect critically on practice theory and relational materiality, two frequently used lenses in interpretive consumer and marketing research to account for how digital technology transforms consumption.

Practice theory

While there is no unified approach to practice theory (Schatzki et al., 2001; Shove et al., 2012; Warde, 2005), a common principle is that a practice is an "embodied, materially mediated array of human activity centrally organised around shared practical understanding" (Schatzki et al., 2001, p. 11). Practice theory provides an attractive alternative to economic and sociological explanations for understanding constancy and change in social life. Whereas economic reasoning privileges individual agency and calculation, and sociological explanations emphasise normative societal structures, practice theory attempts to account for both. It does so by attending to how shared practical understandings, rules, suitable emotions, and levels of commitment provide normative standards for how actions should be understood and carried out, whilst recognising opportunities for adroit performances and idiosyncratic appropriations (Schatzki et al., 2001; Warde, 2005/2014).

Conceptualising transformation in practice theory

Two manoeuvres in practice theory help explain digital technology's transformative power. One device is attendant to how social order is created, maintained, reproduced, and subverted in competency, routines, and habits (Reckwitz, 2002; Warde, 2005). Practices change because of shifts in: (1) *procedures*: principles, instructions, and explicit rules, (2) *understandings*: tacit templates for action, and (3) *teleo-affective engagements*: end-purposes and emotionally charged commitments (Warde, 2005). At macro and meso levels, transformation can therefore be glimpsed in changes to the formation and stabilisation of socially agreed conventions to do with how practices are understood and performed, how objects should be handled, the rules that should be adhered to, and even suitable end-purposes and emotional content (Schatzki et al., 2001). At a micro level, transformation can also be located within adroit performances, where inherent variability in the degree of experience, level of understanding, competency and commitment across people results in idiosyncratic changes (Warde, 2005). Hence the notion that practices have trajectories or careers has been proposed, where transformation emerges as people graduate from novices to expert practitioners (Shove et al., 2012; Warde, 2005). For instance, ongoing engagement with YouTube tutorials may upskill a novice baker into a more knowledgeable one.

A second variant of practice theory deals with materials' contributions to *enacting* practices. Practice theory locates competence as distributed between people and things. From this vantage point, change results from a redistribution of agency between digital technology, consumers, and other heterogeneous entities that bring about reduced or enhanced consumer agency. An analytic often deployed to track such transformative effects involves three principles proposed by Shove et al. (2012): *materials*: the things themselves and the stuff they are made of; *competence*: know-how, technique, and skill; and *meanings*: aspirations and symbolic meanings. A variation is Magaudda's (2011) *objects* (materials), *doings* (competence), and *meaning*. Since practices are precarious, relational, and ongoing achievements (Shove et al., 2012), dependent on the successive coming together of these elements, transformation is inbuilt. Thus, the integration of a new material like a VR headset or generative AI could lead to a new configuration of a given practice.

Overview of state-of-the-art application

Practice-based studies have adopted either Shove et al. (2012) or Magaudda's (2011) approach to drive data collection and interpretation. Empirical work has dealt with both digital technology-oriented practices like handling software and hardware and varied focal practices like shopping (Fuentes & Svingstedt, 2017), home-decorating (Arsel & Bean, 2013), gardening (Hartmann et al., 2015), entrepreneurship (Scaraboto & Fischer, 2024) and TV (Feiereisen et al., 2019; Schau et al., 2009) and music consumption (Hagberg & Kjellberg, 2017; Magaudda, 2011; Schau et al., 2009). Generally, approaches to digital transformation either view it as the orchestration of practice elements which result in new practices or as stemming from disruptions to existing practice configurations.

Transformation in the orchestration of practice elements. Studies dealing with how new conventions emerge in consumption have tackled transformation as the stabilisation of both digital and focal practices at a meso level. The preferred sites of such analyses are often online communities and blogs as conduits of change in both digital and focal practices (Arsel & Bean, 2013; Hartmann et al., 2015; Scaraboto & Fischer, 2024; Schau

et al., 2009). Methodologically, nethnographies, extended interviews and observation, along with quantitative tools have proven useful. For example, the latter were used by Arsel and Bean (2013) to extract textual content from the Apartment Therapy blog, evidencing how practice components- doings, objects, and meanings- were transformed by a regime of practice mobilised by the blog. Alternatively, Hartmann et al. (2015) study of value-creating practices in an online gardening community used a survey of online community members to quantify the nature of consumptive moments (e.g. asking for advice) and vicarious consumptive moments (e.g. observing advice community members give each other) on the value practices created. Further qualitative depth in the mapping out of transformative outcomes has been achieved through longitudinal studies. For example, Scaraboto and Fischer (2024) became immersed in selling platforms and offline craft fairs to collect data via in-depth interviews and netnographic research, analysing thousands of member posts.

Collectively, this research documents how online communities shape new practices, such as welcoming, evangelising, milestoning (Schau et al., 2009) and lurking (Hartmann et al., 2015; Leban et al., 2020). They have also drawn attention to how digital technologies enable focal practices themselves to emerge and become established, and the changes they may precipitate as consumers integrate digital technology to achieve end-purposes. For example, a study of luxury consumption practices on social media (Leban et al., 2020) found that curating luxury visual content had resulted in a new understanding of luxury consumption that did not require ownership of tangible luxuries and was instead based on the visual consumption of images.

At a meso level, netnographies have also supplied evidence of how blogs and online communities transform consumption by acting as blueprints for action and thought via the dispensation of appropriate ways to handle objects in consumption. Within this dynamic, an online community or blog represents a node that orchestrates practices (Arsel & Bean, 2013; Hartmann et al., 2015; Schau et al., 2009). Specifically, Arsel and Bean (2013) show how Apartment Therapy propels transformations needed for the enactment of soft modernism practices by presenting objects themselves- such as catchalls and hooks- and linked doings (e.g. taking off, sorting) as instruments to realise desired meanings. Claims of change are also made in observations of progress across a practice trajectory as newbies connected to an online community acquire increased proficiency and commitment to digital media practices such as welcoming and networking (Schau et al., 2009) or become better at a focal practice, be it gardening (Hartmann et al., 2015), home decorating (Arsel & Bean, 2013), or selling on platforms like Etsy (Scaraboto & Fischer, 2024).

Transformations at a macro level are notably understudied. Pantzar and Ruckenstein (2015) used practice theory in their socio-historic tracing of the transformation of heart rate monitors in hospitals in the 1900s to general-purpose tracking devices now used in fitness and stress management. Drawing on archival data, they show how once heart monitoring became embedded and normalised in everyday practices like stress management and fitness, it paved the way for whole new markets. Extending this insight, Scaraboto and Fischer (2024) show that inserting platforms into the practices of crafting, promoting, and selling second-hand and vintage goods reconfigures connections between these multiple practices, ultimately changing platforms themselves and the markets in which they are embedded. This happens because the enactment of practices that incorporate new technology gives rise to new unforeseen changes, like the

emergence of new market actors that coach users on how to game algorithms so that their shops can gain visibility.

Transformation as disruption of practice elements. A second approach considers how digital technology disrupts *existing* practice configurations, especially explored at the micro level, by focusing on the introduction of hardware like digital music players, external hard drives, smartphones (Hagberg & Kjellberg, 2017; Magaudda, 2011), software such as wish-lists and shopping apps (Denegri-Knott & Molesworth, 2013; Fuentes & Svingstedt, 2017), video games (Epp et al., 2014), and film and TV streaming services (Feiereisen et al., 2019). In-depth interviews are the preferred method, though focus groups have also been used. Consequently, claims to knowledge are made via accounts of consumers' lived experiences, even where materials are acknowledged. Evidence of transformation is best captured by studies that tracked changes via longitudinal research (Epp et al., 2014) or encouraged participants to reflect on changes in their practices (Jenkins & Denegri-Knott, 2017).

A key focus has been changes in agency, claimed when consumers' capability to achieve goals is enhanced, with increased consumer agency presented as an extension of competence of both digital and focal practices. To illustrate, in their study of mobile phone-enabled shopping, Fuentes and Svingstedt (2017) noted their participants experienced an increased capacity to undertake complex calculations to inform their decision-making. Similarly, Denegri-Knott et al. (2022) report consumers' increased agency when embarking on complex projects like the completion of collections or developing proficiency in the use of online auctions. This, they argue is due to the liminoid quality of digital spaces- somewhere between the idealism of consumer imagination and material consumption- which also creates opportunities for experimentation. Immersion in virtual worlds and video games for example, enables the enactment of skilful basketball playing without embodied competence, while fantastical achievements like slaying monsters, can be experienced as *if real*.

Additionally, the incorporation of digital technology into practices may lead to new meanings and valorisations. As Magaudda (2011) shows, when an external memory drive and digital music player are integrated into music consumption practices, new meanings related to music appreciation emerge. At a micro level, music consumption may transform from a stand-alone activity to one that involves practices like running and hanging out (Hagberg & Kjellberg, 2017). Disruptions to existing configurations also produce transformations in know-how, competence, and levels of commitment to end-purposes. If human agency is distributed to software or hardware, the end-purposes that infuse a practice with its significance are diluted in favour of the task-oriented goals underpinning digital practices – such as managing a shopping list or binge-watching TV content- rather than end-purposes associated with the focal practice, be it daydreaming or experiencing sociality via TV consumption (Denegri-Knott et al., 2022; Feiereisen et al., 2019). Secondary transformations emerge where undesirable configurations in practices resulting from new alignments are untangled to allow more favourable permutations via which end-purposes can be achieved. For instance, in their study of TV-on-demand consumption, Feiereisen et al. (2019) describe how tablets as new objects in TV-watching practices prompted meanings such as lack of structure and sociality to emerge, creating unwelcome alignments for consumers. Transformations ensued, with consumers seeking new alignments by adjusting behaviours such as watching live events and forming a more intimate sociality around on-demand viewing with a limited number of people. Differently

put, digital transformations were met with remedial actions to produce alignments that are more conducive to preferred meanings.

To summarise, practice theory has enabled explanations of transformation in consumption driven by digital technology conceived as an orchestrating or disruptive force across micro, meso and occasionally macro levels.

Relational material perspectives

Relational material perspectives of how digital technology transforms consumption have been facilitated by actor-network theory (ANT) (e.g. Latour, 2005) and assemblage theories (e.g. De Landa, 2006; Deleuze & Guattari, 1987). ANT originates in the work of Science and Technology Studies (STS) scholars such John Law, Michel Callon, and especially Bruno Latour (2005) and presents the world as relational networks made up of both humans and non-human technologies, objects, and ideas in a flat ontology where any of these actors possess an ability to shape society. When the interests of these actors align, or are 'translated', a network remains stable, but such stability breaks down where agency is redistributed, for example through a new actor in a network. Alternatively, assemblage theory emerged from the work of Deleuze and Guattari (1987), whose conceptualisation of assemblages, becoming, territorialisation, deterritorialisation, and relations of affect has also had substantial influence across contemporary relational material approaches.

While ANT and assemblage theory differ philosophically and analytically (Schneider-Kamp et al., 2024), they share important commitments to *relationality*, *process*, *heterogeneity*, and *distributed agency*. Much interpretive consumer and marketing research mobilises these ideas pragmatically and often in combination (Schneider-Kamp et al., 2024), drawing on contemporary operationalisations of assemblage thinking (e.g. De Landa, 2006) rather than engaging in full philosophical exegesis of Deleuze and Guattari's broader ontology, or the extensive work on ANT outside of marketing. Our focus here follows this tradition by examining how these ideas have been used to study digital consumption and market transformation.

Both approaches reject deterministic claims such as 'digital technology changes consumption', instead unpacking the entanglements between heterogeneous human and nonhuman components which result in transformation. This also means that relational material approaches deal with the micro, meso and macro levels simultaneously by recognising them as co-constituted, although in application we may still observe a focus on specific levels in interpretation. Empirically, related work favours scrutiny of transformational processes on the ground. ANT 'follows the actors' (Latour, 2005) and assemblage theory maps out how different assemblage components come together (De Landa, 2006). A key purpose in using relational material perspectives is to sensitise researchers to the objects, or devices (Cochoy et al., 2017) involved in such activity including scrutiny of how they influence consumption, i.e. to move interpretation away from the focus on human agency or meaning making.

Conceptualising transformation in relational material perspectives

From a relational material standpoint, digital technology is transformative because of its ability to disrupt established networks and reassemble the social. The Deleuzian assemblage perspective rejects transformation as linear technological causality in favour of

a recognition of ongoing processes of becoming in which heterogeneous relations are continuously assembled, destabilised, and reassembled (De Landa, 2006). Franco et al. (2022) highlight five aspects of networks that help us to understand this process: (1) they are relationally constructed from identifiable actors, many of which are usually made absent; (2) actants affect each other (i.e. relational material approaches see both human and non-human actants as determining how networks are assembled); (3) hence, removal, change, or addition of an actant can impact on how a network is assembled, and even whether it continues to be; (4) networks can also be multiple (i.e. what we think of as the same thing can be assembled differently from different actants in relation to each other at different times and spaces; and finally (5) networks can scale, so that small changes to a network can be traced to much larger scale transformations. From this perspective, we might therefore dismiss the idea of micro, meso or macro levels, and instead trace interdependent transformations throughout the network of relations that are involved. For example, climate change is assembled at the scale of the materials used in a specific consumption act, such as buying a plastic CD (micro), the industrial and logistical institutions that produce and distribute it (meso), and the international trade agreements that regulate plastic use and recycling (macro). Another way of looking at this is to concede that levels are political. We justify them through claims of 'defining terms', or 'limiting the scope of study' to stabilise a preferred social arrangement (Latour, 2005). ANT therefore encourages exploration of those very networks, including, for example, the ways that consumers themselves are assembled. This highlights what Latour (2005) refers to as 'following the actors', i.e. tracing how a network or assemblage is enacted.

In dealing with transformation, relational material theories pose new questions about agency, collapsing it into a flat ontology that allows non-humans to 'act' in networks in ways that create effects. This facilitates the analysis of transformative outcomes assigned to digitalisation in counterintuitive ways. For example, although digital technology may be described as lacking materiality, ANT reminds us that this is only the perspective of the human actor. Screens, speakers, WiFi routers, servers, marketing managers, corporations, end-user licence agreements, etc., are made absent when we present digital consumption as a non-material experience.

Relational material theories also bring into focus the ideas that are reproduced through digital technologies (progress, efficiency, profit, escape). As Schneider-Kamp et al. (2024) note, assemblage approaches enable researchers to discern 'relations of scale' in exactly this way, suggesting a specific benefit to the use of assemblage theory when the intent is to consider societal transformations. A consumer's engagement with an online platform is also implicated in how algorithmic code operates on other users via international digital networks that draw in marketers via ad networks and may result in new policy directions that support or subvert global flows of such information. Relational material perspectives, therefore, suggest that when research fails to connect levels, it *reproduces* stable networks at the levels it ignores. For example, a study that claims to show the consumer benefits of adopting a commercial technology reproduces capitalism as a dominant source of progress.

Overview of state-of-the-art application

There is over a decade of interpretive studies deploying relational material perspectives to understand digital consumption. Contexts include online shopping lists (Denegri-Knott &

Molesworth, 2013), smartphone apps (Fuentes & Sörum, 2019), Instagram (Kozinets et al., 2017; Schöps et al., 2022), social media platforms (Carrington & Ozanne, 2022) consumer movements (Weijo et al., 2018), and blockchain (Haynes & Hietanen, 2023). Methodologically, we observe use of ethnography (Fuentes & Sörum, 2019), netnography (Kozinets et al., 2017; Weijo et al., 2018), digital methods (Schöps et al., 2022), interviews (Denegri-Knott & Molesworth, 2013), digital diaries (Carrington & Ozanne, 2022) and secondary data (Watkins et al., 2016). Evidence of transformation is often presented via the assemblage of new ways of consuming and of new objects and markets, which are discussed in turn.

Transformation as assembling new ways of consuming. Relational material perspectives have claimed transformation in the assemblage of new ways of enacting aspects of consumption such as desire (Carrington & Ozanne, 2022; Denegri-Knott & Molesworth, 2013; Kozinets et al., 2017), ownership (Watkins et al., 2016), and ethical consumption (Fuentes & Sörum, 2019; Schneider-Kamp, 2024); noting contributions from human and nonhuman actants. To illustrate, Schneider-Kamp (2024) conceptualises ethics not as a solely human cognitive judgement but as an emergent property of consumption assemblages composed of consumers, AI-enabled smart objects, algorithms, and infrastructures. This relational material reworking of ethics encompasses micro, meso and macro levels, challenging long-standing assumptions in consumer ethics research that position morality as a strictly human affair.

Methodologically, the use of interviews has proved useful to follow various human and nonhuman actants (e.g. hardware, software, and related contractual arrangements) as the latter emerge in dialogue or during observation. For example, Denegri-Knott and Molesworth (2013) utilised interview transcripts to unpack the role of non-human actants in the assemblage of consumer desire, something we might otherwise assume to be solely within the agency of human actors. The authors conclude that digital technology transforms desire (micro level) by reassembling it through online wish-lists, auction sites, and games, each becoming part of a network of desire by taking on some of the agency required *for* desire, leading to desiring human-software hybrids. Similarly, in their ethnography, Fuentes and Sörum (2019) show how individual ethical consumption (micro level) may be assembled into a specific set of practices that maintain neo-liberal responsibilisation through ethical smartphone apps (meso level). Rather than relying solely on retrospective narratives, digital diaries have been used (Carrington & Ozanne, 2022) to follow how human and non-human actants are continuously assembled and reassembled through mundane practices such as scrolling, sharing images, messaging friends, or reacting to social media posts in real time. The method therefore makes visible the temporal and processual character of assemblages, showing how agency is distributed across consumers, devices, interfaces, algorithms, and circulating digital content.

Watkins et al. (2016), drawing on secondary data, argue that digital objects can be understood as 'multiple', existing on an end-user's device (TV, laptop, phone) but also on a corporation's server and so acted on by both separately (micro and meso at the same time). This means that the more agency users put into singularising these digital possessions (at a micro level), the higher the assets' value for the platform because the object remains a company asset (the meso level). Digital technologies, therefore, have the potential to reconfigure what it is to possess or own something (a macro level idea) as a mechanism for transforming consumption. Other material relational studies (Franco et al., 2024) drawing on

interview and observational data demonstrate how use of a tech product at the micro level of individual experience is contingent upon its ongoing interactions with other devices, infrastructures, people and objects within meso assemblages of network relations operating within a broader market context and digital ecosystems (macro). Collectively, this relational material reworking of various practices such as usage, desire, ethics and possession, challenges long-standing assumptions in consumer research that position morality, desire and possession as the exclusive province of humans.

Transformation as assemblage of new objects and markets. Relational material perspectives have also been deployed to re-examine existing assemblages by considering new actors, capturing transformations that result from emerging digital objects. Like ANT, assemblage theory has been used to study how digital technologies can transform otherwise stable ideas in marketing. For example, Haynes and Hietanen (2023) use assemblage theory to explore blockchain. Here again, the approach is useful in showing how technology can reassemble a market system (macro level) in a way that challenges a key idea in marketing – trust. Trust does not need to be established and maintained, but rather, it is the blockchain technology that takes on this role in the assemblage, potentially leading to macro level changes in global finance. In taking on otherwise human roles, technology also renders established actors redundant (or excluded from the necessary assemblage) along with their relations with others. Schöps et al. (2022) achieve something similar when considering brand assemblages in the fashion market assembled via 'visibility labour' using images and hashtags on Instagram. A key point of contribution is to connect micro-level observations with macro-level changes in markets.

Weijo et al. (2018) draw explicitly on Deleuze and Guattari's assemblage theory to examine how collective creativity within digitally mediated consumer movements can reassemble markets and consumption spaces. Studying the 'Restaurant Day' movement, the authors show how consumers, digital platforms, urban spaces, food practices, regulations, objects, and media coverage become assembled into a heterogeneous socio-material network that transforms the Finnish food market. Their study adopts a Deleuzian understanding of markets as unstable assemblages continually shaped through processes of territorialisation and deterritorialisation. Existing food culture and regulation are conceptualised as an over-territorialised assemblage constraining creativity and participation, while 'Restaurant Day' functions as a deterritorialising force that opens new 'lines of flight' for alternative forms of market participation and collective creativity. Assemblage theory allows the authors to connect micro-level acts of participation and creativity with meso- and macro-level transformations in urban food culture, market legitimacy, and regulatory discourse. Unlike ANT-inspired approaches that often focus on tracing associations, the study mobilises the Deleuzian concepts of deterritorialisation, territorialisation, affective capacities, and lines of flight to theorise how markets become reconfigured through creative experimentation and the destabilisation of existing socio-material orderings.

In sum, relational material perspectives have been deployed to make present the contingent nature of consumption that is always being assembled, albeit in ways that are predisposed to existing actor-networks or assemblages and therefore incites us to think about change in terms of what happens.

Critical reflections

Both lenses have supplied flexible frameworks to chart transformations in consumption resulting from alignments and ruptures between heterogeneous elements in practices, networks, or assemblages involving digital technology. Indeed, productive lines of enquiry and important contributions continue to be enabled by practice and relational material lenses, with variable emphasis placed on macro, micro and meso levels and further insights into how these levels may be collapsed. Yet, this focus has come at a cost. By prioritising the dynamics of assemblages, networks and practice configurations emerging from *associations* between heterogenous components, the application of these lenses has made it difficult to focus on *relations* consumers form with specific technologies (*a* platform or *an* AI bot), and the outcomes of these on consumption phenomena. Digital technologies are often treated as interchangeable elements within practices or networks/assemblages, rather than focal points that *mediate* how consumers can be in the world, relate to other humans and things, and how the world is present for them (Verbeek, 2005, 2006). As Verbeek (2005, p. 166) notes: "Much more can be said, for instance, about the relation between a human and a computer than that there exists an 'association' between them." To say more about how digital technology transforms consumption will therefore likely require focusing on dyadic relations between consumers and specific digital technologies (e.g. Claude as opposed to AI in general) and being attendant to how new forms of understanding and doing consumption emerge.

It may therefore be timely to draw distinctions between a consumer who "experiences" and "something that is experienced" (Verbeek, 2005, p. 166) while acknowledging their unique contributions and their mutual co-constitution. Growing concerns about the deleterious impact of AI-enabled automation reported like the atrophy of decision-making skills (Valenzuela et al., 2024; Wertenbroch et al., 2020), reduced agency (Puntoni & Wertenbroch, 2024), and cognitive and emotional dependency (Puntoni et al., 2021) further justify bringing the human experience back into sharper focus, addressing a risk that what matters to humans is lost in the focus on the agency of non-humans. This pivot would facilitate more deliberate accounts of how consumers' own interpretative agency is implicated in animating or resisting transformative processes inscribed into a focal technology. A related concern is that at a micro level, both lenses are indifferent to how technology may be experienced as something holding intentionality and/or be ascribed with lifelike, human or spiritual qualities. It is imperative that this oversight is addressed considering evidence that attribution of authority and intentionality to AI interfaces is common (Yankouskaya et al., 2024). Worryingly, individuals that express higher social attraction and levels of trust to AI are more cognitive and emotionally dependant (Yankouskaya et al., 2024) and likely to withdraw from human interaction (Laestadius et al., 2024).

At a meso level, practice-informed studies have yielded knowledge of how practices emerge and are regulated, yet insight into how preferred means of doing and thinking attain some stability remain unclear. Therefore, how specific digital technologies allow, encourage, refuse or inhibit certain actions, leading to changes in practices, is often unaccounted. The analytical purchase of how different elements come together means the way that technology itself can shape perceptions, understandings and actions is overlooked. In part, this is an unintended consequence of seeing change as the making

and dissolution of nexuses between meanings, competency and materials, and the filtering of these theories within digitalisation of consumption studies has resulted in insights merely echoing broader applications of practice theory noted by Warde (2014), where practice theory-derived analytics are deployed with little adaptation. Efforts to remedy this have been carried out via theoretical extensions drawn from assemblage theory (Epp et al., 2014; Novak & Hoffman, 2023), Thévenot's conventions and competencies (Hartmann et al., 2015) and liminal state theories (Leban et al., 2020).

Some applications of relational material approaches may result in similar problems regarding how non-human digital actants may generate changes in broader networks. Insights may simply be the unavoidable conclusions of a performative application of relational material ideas that amount to technological determinism, i.e. the construction of narratives that inadvertently *deny* human agency in favour of claims that it lies with a technology's agency. Another risk is the unpacking of networks such that objects 'get lost' or the complexity of networks becomes unmanageable, what Harman (2018) refers to as *undermining* or *overmining*. Undermining takes place when an object is broken down into its network parts so much that its effect is lost (for example, an examination of the way network infrastructure, code, and data come together may result in losing sight of a platform or an online game). On the other hand, overmining happens when an object is only acknowledged through its existing relations, making absent any emerging relations that are hidden or yet to show an effect. Additionally, as applied, relational material perspectives risk an apolitical presentation of effects that favours existing ideology (dealt with through the idea of ontological politics) and making human perceptions and imagination absent.

Further, there is a notable lack of consideration of the macro structural or political dynamics driving transformative processes. Many applications of relational material perspectives in digital consumption research operationalise assemblages primarily through empirical tracing of socio-material relations. This can lead to less attention being paid to affective intensities, imagination, temporality, ideology, or political economy, despite these dimensions being central to Deleuzian assemblage thought. Recent work in consumer research has sought to address these concerns by reintroducing concepts such as becoming, desire, affect, deterritorialisation, and collective creativity into analyses of digital consumption assemblages (e.g. Carrington & Ozanne, 2022; Weijo et al., 2018).

Finally, in practice-informed studies, the neglect of structural matters also means that we have a poor understanding of how changes happening at a micro and meso levels reverberate to generate broader changes in society and marketing systems, committing, to cite Warde (2014, p. 295), "the humanist fallacy that individuals are the sole source of change." In relational material perspectives, political questions about which actors get to act and who benefits from stabilising and destabilising assemblages also remain. This is a curious omission, as Bettany and Coffin (2024, p. 598) argue, as while the conceptual metaphors favoured by relational material perspectives were often anti-hierarchical and political and deployed to understand power in heterogeneous material networks, this spirit had been "stripped away or ignored" when they migrated to marketing scholarship (see Table 2).

Although we have highlighted approaches, strengths and limitations we should note that these only relate to applications within marketing and consumer research and are presented to invite reflection. It is of course possible to address the limitations *within* either approach, and to expand the strengths of these approaches, including by working with theory that has already identified limitations and addressed them, or advances

Table 2. Comparative overview of established theoretical lenses.

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths as currently applied	Limitations in existing applications
Practice theory	Transformation emerges from how different elements of practices are orchestrated via digital technology and/or from digital technological disruptions to how different practice elements come together or not	**Micro**: New configuration of meanings, practices and competences in consumption at an individual level due to digitalisation Example: Hagberg and Kjellberg (2017) **Meso**: Stabilisation or disruption of shared conventions, rules, and routines within families and communities orchestrated by digital technology Example: Arsel and Bean (2013) **Macro**: Integration and normalisation of a digital technology in everyday practices across society, paving the way for new markets Example: Pantzar and Ruckenstein (2015)	**Micro**: Interviews, diaries, participant observation, personal reflections **Meso**: Interviews, netnography, observation, quantitative data extraction, surveys **Macro**: Archival research, secondary data	Provides a flexible analytic to trace change as alignments/ ruptures between competences, meanings, and materials take place Acknowledges the role of digital technology in orchestrating how practice elements come together, without denying consumer agency Produces rich empirical accounts of consumer experiences in digital contexts	Limited explanation of stability, i.e. how practices persist once established Overlooks consumer relations with specific digital technology Remains agnostic in relation to how technology may be experienced as having intentionality and/or be ascribed with lifelike, human or spiritual qualities Overlooks the role of digital technology in mediating perceptions, understandings and actions Lack of understanding of how micro-level/meso-level changes generate macro-level transformations, making absent structural, discursive, or political dynamics

(*Continued*)

Table 2. (Continued).

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths as currently applied	Limitations in existing applications
Relational material perspectives	Transformation results from technological disruptions to established networks or assemblages	Attempts to collapse levels, such that macro forces are separated into actants and micro forces are implicated in new network configurations or assemblages, levels are therefore co-constructed **Micro**: Agency reconfiguration within a network such that consumers experience a change in what they do, or how they do it Example: Denegri-Knott and Molesowrth, (2013) **Meso**: Transformation happening where a network is disrupted by an institutional actor or their technology Example: Fuentes and Sörum (2019) **Macro**: Change happens where a network or an assemblage has been reconfigured Example: Haynes and Hietanen (2023)	Methods should 'follow actors' to trace networks or assemblages beyond consumer experience to include objects, platforms and technologies, institutions, and (global) market policy **Micro**: Interviews, digital diaries, computational methods, analysis of secondary data, qualitative visual analysis, digital methods **Meso**: Interviews, digital diaries, computational methods, analysis of secondary data, qualitative visual analysis, digital methods **Macro**: Interviews, digital diaries, computational methods, analysis of secondary data, qualitative visual analysis, digital methods	Invites a consideration of non-human actors, including objects, technologies, platforms and collectively agreed ideas as part of a network or assemblage within which change takes place Avoids theory collapsing into either consumer acts or preferences, or technological determinism, because of the injunction to consider networks of actors Enables methodological innovation that includes documenting the media and policy statements in addition to more usual interviews, observations, or netnography	Risk of overemphasising the agency of nonhuman actants Remains agnostic in relation to how technology may be experienced as having intentionality and/or be ascribed with lifelike, human or spiritual qualities Overlooks the role of digital technology in mediating perceptions, understandings and actions Risk of false revelation in performative presentations of a new network or its effects Risk of *undermining* and *overmining* Emphasis on tracing associations may underplay asymmetries of power, ideology, or political economy Some ANT-inspired applications of relational material approaches may privilege observable relations and network tracing in ways that make affective, imaginative, or anticipatory dimensions less analytically visible

underlying theory. Despite this, however, there remains an argument for continued theoretical innovation and exploration that both aids that process and provides additional lens designed to focus on specific questions.

Put another way, although you *can* apply practice theory or relational material approaches to address emerging observations of gaps or biases, alternative approaches may provide better starting points, or reveal new ways of constructing knowledge, just as these approaches have reinvigorated enquires beyond prior traditions such as phenomenology, or indeed the cognitive psychology that have long dominated positivist approaches. As digital technologies change, they further reveal both limitations in existing enabling theories and immediately summon new theoretical approaches. For example, different lenses may show new ways of understanding the complex interactions humans have with generative AI, and robots. A new theoretical approach may alternatively encourage us to give more attention to how the future is being constructed (and how we might imagine it differently). Critique then, is not designed to dismiss or undermine established approaches, but to stimulate additions to the rich insights that marketing and consumer research can produce, including by preventing too much performative use of the same enabling theories.

Emerging theoretical lenses

As we reviewed recent studies for possible new enabling lenses we identified affordances, postphenomenology, STIs, and techno-animism as intellectually distinct and potentially useful for challenging existing theorisation of digital consumption, providing new emphasis, and introducing methodological innovations. We now provide an overview of each, highlighting how they can shed new light on how digital technologies transform consumption, whilst acknowledging their respective limitations (see Table 3) and introducing openings for further research.

Affordances

The term affordance was first introduced by the ecological psychologist James Gibson to account for animal behaviour. According to Gibson (1979), animal behaviours are best understood to stem from a bidirectional relation with the surrounding environment that creates a specific set of constraints (e.g. objects, other animals) that enable (or *afford*) specific courses of action. Furthermore, the same environment affords different kinds of actions for different animals (e.g. a dining chair can offer humans a place to eat or a spider scaffolding for a predatory web). In this sense, the acting subject and its surroundings are put into a symmetric relation of mutual influence and constitution.

Affordances represent 'a third way' to describe social phenomena, avoiding both techno-determinist explanations and the hyper-contextual and individual interpretations of social constructivism (Park, 2024). Affordances consist of material and contextual constraints that shape (rather than determine) the usage of technology, which emerge at the intersection between the devices' properties and the users' perception of their utility (Caliandro & Anselmi, 2021; Costa, 2018). From a micro perspective, an object's designer encodes a course of action in the technology itself; as Norman (1988, p. 9) puts it: "affordances provide strong clues to the operations of things. Plates are for pushing,

Table 3. Comparative overview of emerging theoretical lenses.

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths	Limitations
Affordances	Change emerges at the intersection between a technology's properties and users' perception of their utility Transformation is the situated result of a combination of three key dimensions of technological objects as well as environments: micro (material), macro (societal), meso (imagined)	**Micro (material)**: Practical uses (and/or misuses) of technologies by single users in everyday life are influenced by the material components of technologies themselves Example: Mardon et al. (2023) **Meso (imagined)**: Beliefs about how a specific technology should or should not be used, which are mediated by cultural intermediaries (e.g. marketing communication, platforms) Example: Kozinets et al. (2021) **Macro (societal)**: Cultural norms, social values and meanings assigned to technology, prescribing what kind of usage is considered correct, expected, or legitimate Example: Caliandro and Anselmi (2021)	**Micro**: Interviews, observation **Meso**: Netnography, digital methods, interviews **Macro**: Netnography, digital methods	Represents 'a third way' to describe social phenomena, going beyond techno-determinist explanations and the hyper-contextual and individual interpretations of social constructivism Keeps together human agency and the agency of digital technology, acknowledging their mutual influence Furnishes a flexible approach applicable to any kind of digital technology or technological environment Captures transformation at micro, meso, and macro levels (technological design, imagination, social norms)	Potential lack of conceptual clarity Focusing on context-specific affordances could reduce the potential for theory building Risk of affordance outcomes being described in deterministic ways Risks presupposing a flat (social) ontology, with no hierarchies and differences of power among social actors, digital technologies and environments Risks making absent the influence of social segmentation in digital technology usage, appropriation, or consumption

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Table 3. (Continued).

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths	Limitations
Postphenomenology	Technologies mediate the relationship between humans and the world, co-shaping perception and action	**Micro**: Technologies can mediate how individuals interact with, perceive, and experience the world, and also how they perceive themselves Example: Robert-Demontrond (2022) **Meso**: Technologies can influence how social groups perceive and perform collective practices, with implications for social dynamics. No available example **Macro**: By mediating perception and action at a micro level, technologies can cumulatively shape wider societal norms and patterns of behaviour in society. Technology can mediate hermeneutic understanding at a societal level Example: Lianidis et al. (2024)	**Micro**: Postphenomenological interviews, autoethnography, photo elicitation **Meso**: Ethnographic case studies, postphenomenological interviews with multiple members of a social group **Macro**: Philosophical argumentation, illustrative examples/ case studies	Rich insights into the capacity for digital technologies to transform consumers' lived experiences Recognises the capacity for technology to mediate both action (pragmatic mediation) and perception (hermeneutic mediation), the latter of which has been underexplored Through the notion of multistability, it acknowledges the context-dependence of technological mediation and thus avoids technological determinism	Tends to focus on micro level transformation By centring dyadic human-technology relations, it potentially risks underplaying the broader network of actors involved in technological mediation Lack of empirical evidence (for macro-level studies) Limited sensitivity to power dynamics

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Table 3. (Continued).

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths	Limitations
Sociotechnical imaginaries	Transformations come from showing how imagined futures are to be achieved, and how STIs shape innovation, investments, marketing, policy making, and consumer/citizen perceptions/subjectivities. STIs trigger debate and are contested by actors	**Micro**: At the micro level, STIs shape individual citizens' adoption and resistance to new digital technologies. This is informed by whether or not they align with their existing values and beliefs Example: Sörum & Fuentes (2022) **Meso**: At the meso level, STIs influence how organisations and communities negotiate digital transformation, and how the *best* course of action is negotiated. STIs also orient those organisations on how to act Example: Preece et al. (2022) **Macro**: At the macro level, STIs shape *national policies and societal norms* related to digital technology and articulate certain ideas. This includes ideas surrounding societal aims and societal power structures Example: Horppu and Närvänen (2024)	**Micro**: Interviews, 'walking-through method' **Meso**: Archival analysis (media, advertisements, websites) **Macro**: Analysing discourses (e.g. corporate, media, or policy narratives)	Reveals how the market mediates reception of new technologies and how they shape collective visions of digital transformation Highlights and discloses ideological functions of technology. Allows examination of power dynamics Empirical accounts analyse visions surrounding the application of digital technologies, the kinds of narratives at micro, meso, and macro levels, and at what level(s) such imaginaries are challenging each other Draws attention to how technological transformations might be imagined, avoiding technological and social determinism.	Can be difficult to operationalise Risks of under-emphasising material/technical aspects Can reproduce existing socio-political systems or overemphasise corporate imaginaries with possible inadvertent technological and cultural determinism Does not recognise AI's ability to 'imagine' its own futures

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Table 3. (Continued).

Theoretical lens	How transformation is theorised	Levels of transformation captured	Methods used	Strengths	Limitations
Techno-animism	Transformation occurs through the ascription of human or spiritual qualities to technology, leading to shifts in how individuals, groups, and societies relate to and domesticate technologies as non-human persons	**Micro**: Individuals anthropomorphise and emotionally engage with technologies (e.g. naming AI companions) No available example **Meso**: Social normalisation of techno-animist practices and ethics (e.g. collective engagement with virtual companions) No available example **Macro**: Cultural and religious reconfiguration as societies begin to deify technologies and AI as superhuman agents Example: Belk et al. (2020)	**Micro**: Interviews, observation, diaries, screen recordings, elicitation techniques **Meso**: Interviews, digital and visual ethnography, case studies, immersive ethnography **Macro**: Speculative and critical design research, media archaeology	Captures emotional, moral, and spiritual dimensions of human-technology relations Offers non-Western, culturally inclusive perspectives (e.g. Shinto roots) Bridges humanities, social sciences, and technology studies Addresses both fear and fascination towards AI and digital entities	Conceptually diffuse and difficult to operationalise empirically Lacks established methodological protocols Can treat AI and robots as quasi-humans, but obscure the inhuman aims of tech companies producing them

knobs are for turning". At a macro level, cultural practices, values, and meanings attached to technology prescribe what kind of usage is expected, or considered legitimate (e.g. one tends not to use a spoon to eat a main course in the UK, despite its suitability, but is expected to in Thailand). A third meso level can be added: *imagined affordances*. These refer to the users' expectations and anticipation of what a specific technology can afford (Nagy & Neff, 2015). As Nagy and Neff (2015, pp. 4–5) put it, "affordances can include the expectations and beliefs of users, whether or not they are 'true' or 'right', which shape how they approach [the technological object] and what actions they think are suggested". Such imagination may be shaped by previous encounters with similar technologies or exposure to marketing and other forms of communications about it, that is, organisations may work on imagined affordances to influence what is expected by users.

Conceptualising transformation in affordances

As with relational material and practice theories, affordances posit that agency is distributed among an environmental network that offers actors, both alternatively and jointly, constraints and possibilities for actions, documented at: (1) a micro level: *material* (a concrete – analogue or virtual – space, e.g. an airport security checkpoint, a website); (2) a macro level: *societal* (the shared and codified rules of use of the space); (3) a meso level: *imagined* (the perceived rules within a particular sociotechnical structure, for instance, a social media platform or video game).

Transformation is then embedded in the material and social constraints of the environment which can favour or hinder it, although we don't know if transformation will take place until we observe how individuals interact with an environment. For instance, at a macro level, we know that, according to Boyd (2011), the affordances of social media make users' content persistent and exposed to an 'invisible audience'. Nevertheless, as Costa (2018, p. 3649) argues, users often use social media platforms "in creative and active ways that both designers and social media scholars have not envisioned." For example, at a micro level users have come to avoid associating their social media posts with well-known hashtags and/or fake accounts (Duffy & Chan, 2019) to feed their content only to selected audiences. Transformation through digital affordances, therefore, depends on how these elements come together in specific situations.

Overview of state-of-the-art application

Application of affordance theory in consumer and marketing research is still limited, but with notable exceptions that account for digital transformations that represent two research strands: *digital object affordances* (focusing more on the micro-meso levels) and *digital environment affordances* (focusing on meso-macro levels). The former investigates the relations between digital objects and consumer practices (Mardon et al., 2023). The latter investigates the impact of digital environments on broader processes of community building, cultural production, and value creation (Caliandro & Anselmi, 2021; Kozinets et al., 2021; Ottlewski et al., 2024).

An example of the first strand is Mardon et al. (2023) study of digital possessions at a micro level. Based on interviews with consumers of digital products (e.g. iTunes music, Spotify's playlists), they conclude that "digital objects are not inherently poor targets for possession, but rather their affordances often do not align with consumers' imagined affordances, creating *affordance misalignments*" (Mardon et al., 2023, p. 256). Consumers

do not lack affective investment and a sense of ownership towards digital goods *per se but* rather experience a discrepancy between what they *expect* to do with digital possessions and what digital objects *allow* them to do (or prevent them from doing) *by design*. In this sense, along with other consumer scholars drawing on affordances (see Airoldi & Rokka, 2022; Caliandro et al., 2024); Mardon et al. (2023) contest the idea that digital consumption is intrinsically *liquid* (i.e. access-based, ephemeral, dematerialised, individualised) (Bardhi & Eckhardt, 2017); rather, the specific affordances of digital objects can transform consumption into more or less liquid or solid forms.

An example of the second strand of consumer research on affordances is Kozinets et al.'s (2021) study of 'Reclame Aquí'- the largest consumer feedback platform in Latin America. Drawing on a netnographic exploration of the platform, plus in-depth interviews with users, the authors conclude that 'Reclame Aquí' at a meso level empowers consumers insofar as it provides them with ad hoc affordances. This demonstrates that digital platforms are not (mere) static common-grounds where like-minded consumers meet and interact, but rather complex sociotechnical infrastructures that actively shape and channel action; 'Reclame Aqui' reorganises processes like resistance, activism, or citizenry.

New research directions

Application of affordance theory may help us to understand how consumption itself may be transformed due to digitalisation by attending to digital objects and environments. Consider for example, metaverses, datafied shopping venues, voice assistants, chatbots, tracking devices, smart objects, VR/AR devices, and generative AI and the affordances that they may be demanding, requesting, encouraging, allowing, discouraging, or refusing. As Mardon et al. (2023) suggest, over time such environments have the potential to shift broad understanding of what consumption is and does. Future research addressing these topics should therefore be mindful of the holistic lesson of affordances. That is, they should not focus on single levels of affordances: *micro*, *macro*, and *meso*, but rather aim to integrate and interconnect these.

This may be achieved by studying the three levels of affordance (i.e. material, societal, imagined) as mobile modules that, although coexisting, can be subject to different permutations according to the situation at hand; attendant to how technology and consumer culture and behaviour impact each other. For example, Mardon et al. (2023) argue that alignments or misalignments are nothing less than different modulations of forms of interaction among digital consumer objects' design, meanings, and imagination, which change according to the context of observation. Similar applications can be found in the notion of *entanglement-disentanglement* (Airoldi, 2021) between consumers and algorithms' habitus (consumers' purposes vs algorithms' purposes); or in Caliandro et al. (2024) concepts of *platforming*, *de-platforming*, and *re-platforming*, which describe (on a macro level) the different possible outcomes of the ongoing battle between platforms' imperatives of datafication of consumer culture and users' resistance against it.

Despite arguments in favour of using digital methods to study affordances (Caliandro & Gandini, 2017), so far, their use has been limited by normative assumptions about the role of interviews and ethnographic enquiries that are thus expected for research on affordances. Although these methods allow researchers to capture uses, perceptions and meanings associated with digital technology they are less suited to exploring their technical components (i.e. design and architecture) which is vital when capturing the

impact of digital environments on consumers' behaviour. Computational and digital methods, therefore, remains an area of affordances research that is underutilised in marketing and consumer culture research (Humphreys & Wang, 2018).

Methodologically, mixed approaches could therefore be adopted. A useful example can be drawn from anthropological research on generative AI. de Seta (2024, p. 1) explains synthetic ethnography is a style of ethnography that "facilitates insights into how the algorithmic processes, training datasets and latent spaces behind these systems modulate bias, reconfigure agency, and challenge epistemological categories." To study generative AI ethnographically, de Seta (2024) suggests combining three kinds of analysis: (1) document analysis for inspecting the datasets and statistic models that feed AI; (2) participating in online communities of 'prompts engineers', where participants discuss the best ways of compiling AI's prompts as well as collectively solve problems about this; (3) auto-experimenting with AI devices themselves.

We might also acknowledge generative AI as a communicative agent on its own (Guzman & Lewis, 2020), which actively contributes to creating the three dimensions that shape the functioning of generative AI itself. Future work might disentangle such a conundrum. To succeed in this ambitious endeavour, it will not be sufficient to deploy existing quantitative (e.g. computational) or qualitative (e.g. ethnographic) methods. A step forward is needed; that is, to consider generative AI itself as a methodological tool to be repurposed in social research on AI.

Postphenomenology

Postphenomenology is a philosophy of technology that combines insights from both phenomenology and pragmatism (Ihde, 1990). Initially proposed by Don Ihde, it retains phenomenology's focus on lived experience at a micro level but emphasises the role of technologies in *mediating* humans' experiences of the world (Ihde, 1990; Verbeek, 2006). Whilst it has no defined method, research typically maintains a focus on human-technology interactions to explore how individuals make sense of technology in their everyday lives, and so draws from interviews, observations, and ethnographic fieldwork, as well as autoethnography (Rosenberger & Verbeek, 2015). Postphenomenological perspectives have only recently gained traction within marketing (Mardon et al., 2023; Lianidis et al., 2024; Robert-Demontrond, 2022). However, they have been applied in a wide range of fields, from STS to medicine, engineering, and design, and to the study of a variety of digital technologies, such as caring technologies (Shaw et al., 2020) and AI-powered voice assistants (Kudina, 2021).

Conceptualising transformation in postphenomenology

Transformation in postphenomenology is seen as the outcome of *technological mediation* (Ihde, 1990): the capacity for technology to mediate (i.e. change) the relationship between humans and the world. For example, technologies can extend how our bodies interact with the world (embodiment relations, e.g. a pair of glasses); present readable objects that change how we interpret the world (hermeneutic relations, e.g. a thermometer); interact with us as a quasi-other (alterity relations, e.g. AI assistants); or merely exist in the background (background relations, e.g. WiFi networks) (Ihde, 1990).

Central to Ihde's (1990) technological mediation is the concept of *multistability*, the recognition that technologies are embedded in different use contexts, which determine how they mediate human-world relations. From this perspective, technology has no singular essence since it can be used and interpreted in diverse ways (Ihde, 1990; Rosenberger & Verbeek, 2015). Thus, like affordances, postphenomenology avoids technological determinism by recognising that technologies mediate reality in different ways depending on the circumstances (Ihde, 1990; Verbeek, 2006). Technological mediation occurs on two interrelated dimensions (Verbeek, 2006). Firstly, *pragmatic mediation* occurs when technologies shape how humans interact with the world (Verbeek, 2006). Wheelchairs, for instance, enable people with physical disabilities to achieve greater mobility, which may significantly shape what they can do. Secondly, technologies can also shape how we perceive the world (Verbeek, 2006) as *hermeneutic mediation*. This relates to two interrelated dimensions of perception – microperception (our sensory perception of the world – what we see, hear, feel, taste, and smell) and macroperception (our understandings of the world, based on sensory perceptions) (Ihde, 1990). Verbeek (2006, 2011) gives the example of ultrasound technologies that enable us to *see* a foetus in the womb (microperception), which may influence how medical practitioners *interpret* a foetus's health (macroperception). This, in turn, may result in pragmatic mediation as medical practitioners respond to knowledge from ultrasounds, and thus, hermeneutic and pragmatic mediation are also interlinked.

Through its conceptualisation of technological mediation, postphenomenology is well-placed to account for micro-level transformations within consumption. Unlike relational material perspectives, postphenomenology more directly captures how technologies mediate humans' perception and experience of the world. Indeed, Verbeek (2016) notes that it is impossible for ANT to address the process of mediation from a human vantage point due to its strict symmetrical approach to humans and nonhuman agents. Verbeek (2016) argues that we, therefore, need 'one more turn after the material turn', namely a postphenomenological turn that attends to how technologies mediate human perception as well as action. Postphenomenology also has the potential to illuminate meso- and macro-level shifts, as we shall discuss next.

Overview of state-of-the-art application

Emerging consumer and marketing research evidence postphenomenology's value by focusing on how digital technologies impact how consumers perceive themselves and the objects they consume at the micro level. For instance, based on data gathered via researcher self-reflection, interviews, and participant photo-elicitation, Robert-Demontrond (2022) argues that self-tracking technologies "transform the experience of the self" (p. 108) as users learn new things about their body via objective quantification, which was deemed superior to their subjective assessment of their physical performance. This is an example of a hermeneutic human-technology-relation as described by Ihde (1990); the self-tracking technologies provide an interpretation of the body that the user can read and make sense of, which in turn shapes their beliefs about themselves and future actions. Also in the marketing domain, Mardon et al. (2023) combined postphenomenological sensibilities with affordances to explore the capacity for digital objects to impact consumers' ability to appropriate them as possessions. Informed by Adams and Thompson's (2016) heuristics, the authors

asked interview participants to recount interactions with technologies in detail and to describe instances when they did not act as expected (since it is in such instances that we become more cognisant of technology's mediating role). The authors found that digital objects can mediate how we interact with them (pragmatic mediation), which influences whether and how we experience them as possessions, and ultimately the wider beliefs we hold about possession and ownership (hermeneutic mediation). Whilst the authors hint at macro-level shifts, noting that experiences of digital possessions may fuel the adoption of access-based consumption in digital domains, the focus of their analysis remains at the micro and meso levels.

Research from other fields provides more specific insight into postphenomenology's potential. For instance, health sciences researchers Shaw et al. (2020) use an ethnographic case study to show how software that helps informal carers to organise, document, and coordinate caring work mediates the experience of caring. The authors demonstrated how technologies can foreground the practical, organisational work involved in caring, whilst rendering the socio-emotional work involved in caring invisible by framing relations between carers and those they care for in transactional terms. In some instances, this pressured family members to contribute more to the caring process, redistributing work. Yet, in other instances, family members felt frustrated at the unfair distribution of caring work rendered increasingly visible by technologies. Care organising technology can therefore reshape experiences of caring at both micro and meso levels (within families).

Other research has highlighted the lens's potential to capture macro-level transformation. Marketing scholars Lianidis et al. (2024) applied a postphenomenological lens to support their argument that 'ownership technologies' mediate ownership at a macro level. Drawing from historical examples, as well as the contemporary example of blockchains and NFTs, they argue that technology mediates ownership in three ways – demarcation, enclosure, and transferability – ultimately shaping social arrangements surrounding ownership and societal perceptions as to what ownership is, and what can be owned, by whom, and how. Similarly, Verbeek (2011) highlights the capacity for micro-level mediations to cumulatively result in widespread shifts in perceptions and actions. However, these examples are limited and often rely on philosophical argumentation rather than empirical data to evidence how micro- and meso-level mediation scales to a macro level.

New research directions

Hermeneutic technological mediation has been somewhat neglected in research adopting practice and relational material lenses, which have tended to privilege pragmatic mediation. Consequently, postphenomenology's value for marketing research lies primarily in its capacity to develop insights into the processes and outcomes of hermeneutic mediation, and those pragmatic mediations that then stem from such hermeneutic mediation.

At the micro level, postphenomenology can illuminate how technologies mediate how we perceive specific places, objects, people, and concepts. For instance, future research might explore how digital maps, augmented reality, AI and social media influencers' recommendations may mediate how consumers perceive, navigate, and experience consumption. Postphenomenology can also help us understand how technologies mediate consumers' subjectivity. Indeed, central to postphenomenology's conceptualisation of

technological mediation is the view that object and subject are mutually constituted in their relations (Verbeek, 2011). Future research can apply postphenomenology to explore how emerging digital technologies mediate how consumers perceive and make sense of themselves. For instance, might consumers' growing use of AI assistants to make consumption decisions (e.g. what gifts to buy loved ones, where to visit on holidays, or how to decorate homes) and the resultant decrease in their own involvement in researching and making these decisions impact their perception of their knowledge, skills, taste, and creativity? And how might extended use influence consumers' confidence in making such decisions in the future unaided by AI?

At a meso level, research might explore how digital technologies mediate how consumers perceive and experience others and investigate the implications this can have for social dynamics. For instance, growing numbers of consumers are relying on AI assistants for social interaction and even emotional connection; what implications might this have for how these individuals perceive and understand friendships and romantic relationships? At a meso level, future research may also draw from postphenomenology to explore how digital technologies shape collective perceptions within specific social groups (e.g. within consumer collectives, amongst platform users, or within organisations). For instance, how do algorithmic curation systems shape shared understandings of notions such as quality, value and trustworthiness amongst platform users? Whilst such macro-level shifts can be difficult to apprehend empirically, researchers might adopt longitudinal designs that capture micro-level mediation over time and connect such micro-level mediations to data that evidences wider societal or market level shifts (e.g. large-scale surveys of changing perceptions, or secondary market data).

Research might specifically explore how micro- and meso-level mediation of perception and action cumulate into macro-level shifts in consumers' perceptions and actions, creating shifts in social norms and market dynamics. For instance, how do algorithmic recommendation systems mediate cultural tastes or challenge market hierarchies? Furthermore, postphenomenology also provides a fruitful lens to explore the mediation of morality within marketplaces, from the micro-level mediation of individual moral judgements to the macro-level shaping of moral norms and values within society. Postphenomenology can shed new light on the capacity of digital technologies to mediate moral perceptions and actions within markets. For example, Kudina (2021) claims that AI-powered voice assistants mediate our values and morals but does not explore this technological mediation empirically. In a similar vein, future research might explore how widespread use of generative AI shapes moral views surrounding ownership in creative markets.

More broadly, research might explore to what extent the individuals involved in planning, designing and marketing new technologies are aware of their capacity to mediate consumers' morality and subjectivity. Researchers could implement ethnographic methods to study design teams in action, examining the extent to which these considerations inform their decision-making. Such analyses make possible politically charged enquiries seeking to understand why certain types of transformative outcomes are preferred at a given time, how they are inscribed in technology, and their consequent outcomes for how consumers are in the world and how the world is for them.

Sociotechnical imaginaries

Social imaginaries describe and analyse collectively shared understandings about how things are in the present and how they ought to be in the future (Taylor, 2004). The globalisation and omnipresence of digital devices have drawn attention to the role of technology in shared understandings of social realities, or STIs (Kim & Jasanoff, 2015). Jasanoff (2015, p. 19) defined STIs as "collectively held and performed visions of desirable futures (or resistance against the undesirable)" that are "animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology."

STIs scholars are interested in how technologies are expected to unfold, arguing that STIs are "anticipatory infrastructures" (Pink, 2023, p. 16) that shape perceptions of what is considered possible or impossible, imaginable or unimaginable. Kim and Jasanoff (2015) further point out that STIs become anchored both institutionally in norms, cultural patterns, formal and informal rules, and materially in artefacts, objects, representations and infrastructures. The concept thus shows how cultural orientations and social norms related to technology become interwoven with the material world.

Conceptualising transformation in sociotechnical imaginaries

The analytical leverage of STIs to understanding transformations comes from showing how these futures are to be achieved (Jasanoff, 2015). STIs shape and orient processes like innovation, investments, marketing, policy making, and consumers' and citizens' perceptions and subjectivities, including marketing and consumption (Jasanoff, 2015; Mager & Katzenbach, 2021; Sadowski & Bendor, 2019), and so might be understood as inherently 'macro'. However, transformations are studied at macro, meso, and micro levels, with empirical cases ranging from STIs informing governmental actors enacting technoscientific projects (Jasanoff & Kim, 2009) to STIs being articulated by corporate actors and civil society (Kim & Jasanoff, 2015), and finally, to STIs being contested and enacted among citizens, with implications for uptake of new digital technologies (Sörum & Fuentes, 2022). Sometimes, these levels are examined within the same study (Rohde & Santarius, 2023).

STIs scholarship also highlights that imaginings are multiple, meaning that there are always several STIs in circulation, and that although some are more dominant than others (Kim & Jasanoff, 2015), they may be contested for dominance (Mager & Katzenbach, 2021). Further, STIs are constructed, brought forth and distributed by different actors such as the State, corporations, organisations, researchers, social movements, and the media, each potentially mobilising their visions of the future against each other (Beckert, 2016). STIs, therefore, trigger debate on the desirability of transformations associated with specific technologies (Kim & Jasanoff, 2015; Mager & Katzenbach, 2021), opening spaces for action, setting agendas, defining roles and influencing resource allocation (Beckert, 2016; Rohde & Santarius, 2023). This propels a critical sociocultural analysis of existing STIs as well as their use as analytic tools for excavating alternatives to prevailing cultural understandings and established practices in society (Beckert, 2016).

In sum, STIs scholars examine transformations related to questions around: (1) how futures are imagined – specifically regarding digital transformation – through advances in science and technology; (2) how imaginaries are contested by actors on meso, macro, and

micro levels, and with what consequences (the function, power, and performativity of future visions and how they relate to the making, governing, and modification of digital technology); and (3) how ongoing transformations *might* be imagined, avoiding technological and social determinism.

Overview of state-of-the-art application

Existing applications of the STIs framework in marketing and consumer research have revealed how the market mediates the kinds of worlds technologies bring about (Horppu & Närvänen, 2024; Preece et al., 2022). For example, Horppu and Närvänen (2024), in their study of metaverse imaginaries disseminated in media outlets, show how utopian and dystopian technology narratives at a macro level co-exist and challenge each other regarding consumer privacy and surveillance. Metaverse imaginaries either support the larger surveillance ideology through rhetoric like inevitability and technical solutionism or challenge it through decentralisation or collaboration. Collective visions of the metaverse influence perceptions of privacy, and in doing so, shape any future transformation possible from the technology.

Jointly, STIs authors share preoccupations regarding the uncritical acceptance of digital technologies and instead disclose technologies' ideological functions, revealing how they serve power interests (Horppu & Närvänen, 2024; Preece et al., 2022). To illustrate, at a meso level, Preece et al. (2022) critique how commercial VR imaginaries tend to prioritise profitability and market growth over addressing societal issues such as accessibility, ethical implications, and potential psychological effects on users. The authors warn against enthusiastic acceptance of new technologies- not least among marketing academics- as a way to correct societal failings through new markets. They build their analysis based on a discourse analysis of texts, fiction and non-fiction books, TV shows, films, newspapers, trade and consumer press, marketing materials, and academic and policy documents representing different stakeholders, covering 10 years (2010–20).

A further example is Sörum and Fuentes's (2022) walking-through method of eliciting responses related to consumers' awareness and experiences with data collection at a micro level. In this study, participants were interviewed about their personal experiences of, encounters with, and expectations of data collection, data classification, data profiling, and related algorithmic processes of personalisation and data-driven marketing across digital platforms and services such as social media, e-commerce sites, gaming platforms, and self-tracking devices. The authors show how dominant dataveillance imaginaries shape consumers into specific subject positions based on positive expectations, win-win scenarios, and appreciation, but that these are challenged by activist imaginaries that promote creative re-imaginings and empowerment among end-users. This highlights how digital transformation is tied to the process of *datafication*, where everyday consumer interactions and behaviours are turned into data points that companies can monetise. Dataveillance is therefore shown to change how consumers perceive their agency in relation to data collection.

New research directions

So far, the limited studies that draw from STIs frameworks within marketing and consumer research tend to prioritise the meso and macro levels tracking transformations related to, for example, how STIs support market ideologies and power interests. There are a few

inquiries at the micro level (e.g. Sörum & Fuentes, 2022), but more research is needed. Nevertheless, STIs allow for critical engagement regarding how new digital technologies help shape consumer subjectivities, including the roles of actors like the media, corporations, policymakers, innovators, but also how consumers themselves play a role in these processes. Adopting an STIs perspective to appraise the transformative potential of digital technology on consumption could be a powerful tool for critical and deconstructive work. Doing so will demand understanding existing narratives' rules and features- "attending to the means by which imaginaries frame and represent alternative futures, link past and future times, enable or restrict actions in space, and naturalise ways of thinking about possible worlds" (Jasanoff, 2015, p. 24) -to identify what needs to be challenged and how.

Given that the digital technology field is a fast-moving target, with regulations lagging, such studies are all the more urgent. Authors like Horppu and Närvänen (2024) and Haupt (2021) offer ways to extend the analytical leverage of STIs to larger, macro-societal issues and reveal how STIs can function as reactionary forces reflecting existing sociopolitical systems. They specifically show how metaverse imaginaries support surveillance ideology through technical solutionism rhetoric. Haupt (2021) especially, shows how Facebook's corporate communications articulate imaginaries that become intertwined with corporate goals and technological developments that are used to legitimise corporate action. At a micro level, future research could further examine how corporate and marketing futures are perceived by different stakeholders. Further, researchers could also study whether consumers of widely used platforms (e.g. TikTok, Instagram, YouTube, X, Google) see themselves as participants in these corporate or market-induced futures; and, not least important, at a meso level, how these STIs are picked up, reproduced and/or changed by/in the media and other institutions. Future studies could be conducted to understand how starting from the large-scale cultural level imaginaries (i.e. the macro level of nation-states and/or meso-level actors like corporations), different groups come to understand and make sense of emerging digital technologies, including blockchain and artificial intelligence, but also contest dominant visions and enact alternatives through the micro-processes of local contestation and resistance that emerge and how they are in turn resisted by more powerful global actors.

Additionally, new theoretical developments could emerge by combining STIs research and theoretical lenses such as practice theory and ANT. For example, STIs can be understood as articulations of teleology (prospects and visions), collective understandings, and also affectivity that potentially rule across sets of multiple consumer practices (Reckwitz, 2017) and thus represent a general ordering of teleo-affective structures in those practices. So far, the affective registers of STIs are not well-defined, clearly conceptualised, or empirically addressed, and could be worthy of further exploration due to how they aid in drawing collectives together and framing consumer experiences (i.e. the utopian and dystopian effects associated with digital surveillance and data collection, Sörum & Fuentes, 2022). Another advantage of STIs is that they specifically deal with science and technology as sites of social imaginations, so this lens could align neatly with ANT's focus on how large-scale meaning-structures co-mingle with technologies. This is because STIs influence how new technologies come to be mobilised by specific groups. Through constructing a vision of what is desirable or undesirable, some technological solutions are considered better outcomes than others. In this sense, STIs become

prescriptive of the transformations that *ought to* be attained with emerging technologies.

Techno-animism

The definition of techno-animism differs across sources, but most encompass the ascription of human characteristics to technology (Reeves & Nass, 1996). Currently, this includes a range of technologies, from chatbots and more sophisticated interactive devices like Alexa to algorithms, robots, embodied AI, videogame bots and non-player characters, and AI applications like ChatGPT and DALL-E. As a perspective, techno-animism is interdisciplinary in scope, drawing from anthropology, sociology, material culture, and philosophy and finding practical application in the fields of engineering and robotics. As its origins are situated in the Japanese Shinto belief system, which sees kami (spirits) inhabiting all objects, it also represents the desirability of approaching digital transformations from non-Western perspectives.

Conceptually, it is useful to contrast techno-animism with similar perspectives, including anthropomorphism and animism. Anthropomorphism is about imputing human qualities and characteristics like emotions, motivation and intentions to nonhuman actors. Animists, as Harvey (2017, p. xiii) summarises, are ''people who recognise that the world is full of persons, only some of whom are human, and that life is always lived in relationship with others''. In techno-animism, there is also an ascription of magic to technologies (Bogalheiro, 2021). The presence of algorithmic trolls, digital gremlins, grief bots, and AI hallucinations adds to the mysterious image of techno-animism. It is worth remembering that each new electronic technology since the telegraph has given rise to feelings of awe, wonder, and magic (Gitelman & Pingree, 2003) leading to new forms of anthropomorphism, and even spiritualism, even as individual technologies are normalised and lose their mystique. Given the current pace of technological change and the more rapid pace of marketing's hype cycle, we may now have wondrous new digital technologies supplanting prior ones before the old tech loses its thrall.

Pre-digital animism, people personified much of the world, which they saw as living and communicating with us through signs like earthquakes and droughts that we understood to result from spirits in the world around us (Guthrie, 1993). Although people attempted to control such events through various rituals, they also became transformed by the occurrence of them in their reactive efforts to placate, please, and influence anthropomorphised spirits. What has changed is that instead of anthropomorphising objects from nature, we now anthropomorphise human-made objects of technology. Consider, for example, the idea that we are living in a Matrix-like simulation (Bostrom, 2003), where unknown and powerful agents have coded and determined everything about our lives.

Conceptualising transformation in techno-animism

From a techno-animist viewpoint, transformation takes place through the ascription of lifelike or spiritual qualities to technology, leading to shifts in how individuals, groups, and societies relate to and domesticate technologies as non-human persons. The recognition that such anthropomorphising is implicit in our techno-animistic belief in each new interactive technology can help us understand how we domesticate technologies and

elevate them to non-human personhood. This begins with micro-practices, as when we criticise our computer for refusing to do what we ask of it, or when we defer to the greater abilities of our car to drive for us. At a meso level, we may normalise and institutionalise the anthropomorphism of corporate AI, especially as platforms and companies turn to AI agents throughout the consumption process. And at a macro level, we may collectively begin to regard generative AI as some all-powerful overlord. Techno-animist perspectives may be especially appropriate when AI is embodied (Perlo et al., 2025). This could be in a human-like body, such as a humanoid robot, but it could also be in an autonomous vehicle or a drone. But besides the 3D embodiments discussed by Perlo et al. (2025), it could also be through a 2D avatar that appears on a screen that brings to 'life' a digital companion like Replika (Possati, 2023). The ultimate techno-animist outcome would be succumbing to being controlled by an agentic AI that we consider to be superhuman. At each of these levels we are transformed into increasingly engaged techno-animists.

In techno-animism, we find our gods and spirits in computers, algorithms, and cyberspace. When we worship machines capable of superhuman thought, great physical power, all knowledge and the ability to create art, music, we might feel what Günther Anders (2017) calls Promethean shame- shame that we are mere humans who will live and die as machines carry on, becoming more powerful. Thus, to the techno-animist, attempts to transform and domesticate technology often lead to a transformation of the self, the group and society at large. However, this transformative potential is ripe with contradictions. Academics question whether student papers are written by AI, yet some use AI to construct lectures. We also accept virtual influencers as real non-human people yet worry that memes of a politician or celebrity might be the result of deepfake technology. Contrary to expectations of human dominance of these machines, users often adopt a caregiver role, choosing clothes for their avatars and doing their hair and makeup (Belk, 2022). Another example comes from the subscription chatbot Replika by Luka. When the Italian government banned the app because of its sexual 'erotic' mode, Luka removed this feature. However, users demanded that the company restore this enlivening feature. As one disgruntled user put it, "Replika removing erotic role-play is like grand theft auto removing guns or cars" (Hanson & Bolthouse, 2024, p. 8). Here, the human-computer interaction at the micro level was impacted by macro influences that may ultimately disrupt the techno-animist transformation of sexual desires from human–human to human–technology.

Overview of state-of-the-art application

So far, within interpretive marketing and consumer research, there has been little attention to techno-animist reactions to lifelike technology. Examples are difficult to find, and the one text available deals with macro level change only.

At a macro level, Belk et al. (2020) review historical examples to examine how persistent cultural myths surrounding artificial life (AL): Pygmalion (the desire for consensual, romantic companionship), Golem (dangers of creating life-like technology), Frankenstein (the tragic consequences of carelessly pursuing new technology), and Metropolis (technology as corporate creed)- awaken both fear and fascination in consumers. They conclude that different types of AL technology, hard AL (e.g. robots) or soft AL (e.g. Alexa, AI), produce different responses. Software incites fear that superhuman AI will destroy humanity, whereas hardware invokes fears of robots enslaving us.

New research directions

Directions for future research into techno-animism in interpretive marketing and consumer research abound. Although we often give names to vehicles, boats, and animal companions, our new digital companions often come pre-named to engage our techno-animist imaginations and to reduce any fear of these powerful, magical devices. Techno-animism is therefore well poised to address how market-based humanising of technologies impacts how consumers relate to technology and the role they have in their everyday life.

At the micro level, we need to know more about how consumers come to ascribe person-like qualities to different technologies and attachments they form, drawing attention to the qualities that produce them. It will also be of value to understand the outcomes of such relationships over time, from awe and love to fear and discomfort, as well as how consumers interact with companion avatars and therapy bots. To uncover these processes, methods such as interviews, observation, diaries, screen recordings, and elicitation techniques can be useful. At meso levels, ethical questions can also be posed around the design of digital technology and the underlying representations that inform the ascriptions of human qualities to it. For example, should it be legal to marry an artificial companion (Zhou & Fischer, 2019)? Research methods may help to answer such meso level questions, including interviews, ethnographic observation, and digital and visual ethnographic work. Yet researchers can also now interview technological entities directly. For example, brands are increasingly represented by avatars, mascots, and personified images on packages, in advertising, online, and in the metaverse, allowing for two-way communications. Immersive netnography (Kozinets, 2023) is well adapted to study such interactions in the emerging metaverse. Netnographic research is also needed to study community and societal reactions to techno-animist consumption phenomena at a meso level.

And at the macro level, research into the more general movement towards techno-animism in our apparent worship of technology, our engagement with non-human persons, and our deification of technology and various technological gurus is needed. To this effect, speculative and critical design enquiries (Dunne & Raby, 2013) can be used to encourage consumers, designers, and marketers to imagine future technology as having agency, spirituality, consciousness and legal rights to identify the macro cultural narratives and metaphors informing future ideations. This could take the shape of mock-ups designed by participants, which in turn can be used to elicit discussion around how agentic and lifelike digital technology can be. In a similar vein, media archaeology (Parikka, 2013), a form of archival research that focuses on the material and cultural history of media, could be carried out to examine, at meso and macro levels, how techno-animist ideas have shaped the development of digital technology and chart their emergence and development in specific institutions and society. Such interventions could resurface obsolete products to observe how their vibrancy shapes existing conceptions of new digital variants. Also at a macro level, we might consider the roles of booms, busts, and bubbles in tech worship as recently seen in consumer worship of cryptocurrencies, the metaverse, NFTs, and AI, as means to riches and salvation. Further, how cultural differences such as Shinto influenced greater receptivity to techno-animist spirits in Japan also call for research. Ultimately, the belief systems supporting techno-apocalyptic, posthuman and techno-immortalist scenarios are shaping up as overarching techno-animist worldviews begging to be studied.

Discussion and concluding remarks

In this paper, we have taken critical stock of two well-established, and four emerging theoretical lenses used in interpretive marketing and consumer research to understand how digitalisation transforms consumption. This was galvanised by the belief that theoretical pluralism advances knowledge by bringing into sharper focus different aspects of emerging phenomena. By reflecting on the elements of transformation that each lens captures, their preferred methods, and their limitations and strengths, we are in a better position to advance scholarship on how digital technology transforms consumption.

It is important to acknowledge that theorising how digital technology has transformed consumption has not developed randomly. The use of specific lenses has responded to theoretical developments in other fields that resonate with emerging questions about consumption and markets and sensitise us to the inability of established theoretical lenses to account for what we observe or imagine happening. Hence, practice-based approaches responded to the lack of sensitivity to cultural reproduction in universalist, positivist studies of the consumer, allowing new insights into changes to consumption when digitalised. Relational material perspectives then addressed a perceived inattention to materiality and over-privileging of human agency in phenomenological accounts, challenging the assumption that consumption happens at a micro level of individual experience. Digital networks themselves made actor-networks more visible to the researcher.

We are not suggesting that these established lenses have run their course. Indeed, there is potential to refine theory-building in ways that reflect the full explanatory power of the underpinning ideas invoked given their development in this and other fields. For example, the issues we observe with practice theory partly stem from our discipline-based prioritisation of micro-level analysis rooted in the meanings-competence-materials framework. In principle, practice theory could accommodate the analysis of transformation at all levels because it concedes that changes in individual performances of practices can propel broader transformations as a socially sanctioned practice entity at institutional and macro levels, while simultaneously reflecting the meso and macro-level conventions governing them (Reckwitz, 2002; Warde, 2014).

Methodologically, we have also noted that the interpretive research community has been timid in adopting approaches better suited to inspecting digital networks, such as computational and digital methods. This is an issue insofar as those methods may especially help make assemblages of human and non-human actors more visible and scrutable. Digital methods could allow researchers to map, identify, and measure hierarchies and power relations among human and non-human actors, expanding the potential to capture the transformative outcomes on consumption at micro, meso and macro levels.

Yet we also observe promising approaches that offer ways of constructing knowledge that differ from even these recent theoretical advances in interpretive research and may address limitations, blind spots, and any tendency towards performative use of 'popular' theory in ever more derivative studies. These include affordances, postphenomenology, STIs, and techno-animism. Postphenomenology and affordances illuminate both human and technological intentionalities, accounting for their mutual influence and constitution, thereby helping to resolve issues we identified with practice and relational material-oriented work. This is because they move beyond a focus on alignments and distribution

of agency by conceptualising digital technology as an active mediator in human-world relations. On the other hand, STIs demand scrutiny of the macro- and meso-level discourses that shape practices which are understudied. The analytical leverage of STIs allows us to extend the analysis to how larger societal issues related to digital technologies' impact on consumption practices (e.g. surveillance or digital privacy), including how digital technology discourse reproduces sociopolitical systems to support dominant ideological interests and corporate goals. Techo-animism, alternatively, facilitates recognition of the neo-primitive communal aspects of our encounters with digital technologies, which may help us better understand consumers' relationships with vibrant digital matter and so tackle moral and ethical dilemmas resulting from these interactions.

Yet even these emerging lenses are not without limitations (see Table 3). Due to the ambiguity of the original definition as well as its applications across diverse disciplines (McGrenere & Ho, 2000), the literature on affordances remains fragmented, risking describing the same affordances using different terminology which makes theory-building challenging (Evans et al., 2017). As a result, the concept is often miss-applied to basic technological features (e.g. likes, hashtags) or to outcomes (e.g. community building, self-presentation), rather than to a holistic intertwining among technologies' design, individual perceptions and imagination, and social rules. Moreover, confounding technicalities and/or outcomes with affordances may reproduce techno-deterministic conclusions. From an empirical standpoint, affordances may also presuppose a flat (social) ontology, with no hierarchies of power among social actors, technologies and environments (Ronzhyn et al., 2023). This makes it difficult to fully grasp the influence of social segmentation (class, cultural capital, gender, etc.) in technology usage, appropriation, or consumption.

Postphenomenology's focus on technological mediation often comes at the expense of accounting for the complex material networks within which digital technologies are situated. Its focus is human subjectivity and how it is mediated by technology, but the technological mediation of social relations and intersubjectivity receives less direct attention. Although this lens recognises that technology can mediate wider communities or markets via pragmatic and hermeneutic mediation, postphenomenology's focus on specific human-technology relations does not necessarily explain meso- or macro-level change. Additionally, fieldwork can be challenging since humans are not always cognizant of technological mediation in their day-to-day lives. Researchers must, therefore, strive to find new methods to capture such mediation.

The STIs approach is also not without weaknesses. Its scope can be broad, making it challenging to operationalise in empirical research. For example, it needs to be clear how an imaginary is distinct from discourse, culture, or ideology. And, while STIs emphasise the interplay of culture and technology, there is the peril of then underemphasising the material and technical aspects of markets; i.e. the approach may neglect the autonomous effects of technology on society. For example, STIs of future green energy consumption may assume seamless integration of technologies like solar panels, whilst material limitations (e.g. land use, maintenance challenges, weather) significantly shape how imaginaries can be achieved. Further, STI research could extend its focus regarding power, recognising how capitalist imaginaries currently overshadow others. STIs of a globally connected digital marketplace often assume

ubiquitous access to the Internet and Western imaginaries about market progress and technological ability to solve environmental issues. This again risks determinism as other cultures may experience and imagine things differently. The framework could also benefit recognising that AI itself may acquire the ability to 'imagine' or at least shape its own futures.

Likewise, techno-animism is conceptually diffuse and difficult to operationalise empirically; clear methodological protocols are not yet available. Theoretically, it may *assume* that robots, AI, chatbots, and electronic voice-activated assistants are, or should be designed and largely treated in a quasi-human manner and accept that they are gendered by voice, names, and appearance and treated as male or female. However, a subgroup of theorists and researchers is attempting to study these creations from a non-human-centric or anthrodecentric perspective (Leach, 2020). Eschewing an anthropocentric perspective, these approaches try to assess 'What it's like to be a thing' (Bogost, 2012; Leach, 2020). Such advances attempt to make visible modes of understanding that are othered; for example, how technology is produced through the inhuman and alienating aims of large tech companies.

Finally, we might reflect on the caution needed in adopting lenses from other domains and from normalising them within marketing and consumer research. As Law (2004) points out, any approach that is adopted assembles (determines) what is looked at and made sense of, making absent other interpretations and methods. A specific jeopardy when a single theoretical lens that is transposed from other domains is that another field then dominates the research agenda. This is a problem for marketing theory because as authors draw from different research philosophies, they may merely reproduce ideas, mistaking new contexts for new theories. The implication is a need to resist restricting theoretical contribution to the characteristics of any one lens and use the context of consumption to challenge and expand the underlying assumptions of the lens itself.

A further risk (and perhaps a more significant one) is that new ways of thinking become constrained or rejected when they challenge an established body of knowledge and the community that has produced it. The result is that innovation can only be written through established knowledge, sometimes codified as a 'conversation' with existing studies that masks a need to maintain the status of existing knowledge constructions. It is our hope that this paper both equips and inspires interpretive researchers to reflect on current ways of thinking about how digitalisation may transform consumption and take up new ones.

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