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Algorithmic consumer culture

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Abstract

This article conceptualizes algorithmic consumer culture, and offers a framework that sheds new light on two previously conflicting theorizations: that (1) digitalization tends to liquefy consumer culture and thus acts primarily as an empowering force, and that (2) digitalized marketing and big data surveillance practices tend to deprive consumers of all autonomy. By drawing on critical social theories of algorithms and AI, we define and historicize the now ubiquitous algorithmic mediation of consumption, and then illustrate how the opacity, authority, non-neutrality, and recursivity of automated systems affect consumer culture at the individual, collective, and market level. We propose conceptualizing ‘algorithmic articulation’ as a dialectical techno-social process that allows us to enhance our understanding of platform-based marketer control and consumer resistance. Key implications and future avenues for exploring algorithmic consumer culture are discussed.

Keywords:

algorithms, consumer culture, AI, digital platforms, surveillance, consumer resistance

'The great festival of Participation is made up of myriad stimuli, miniaturised tests, and infinitely divisible question/answers, all magnetised by several great models in the luminous field of the code' (Baudrillard 1993, 70)

1. Introduction

Powerful machine learning applications and AI technologies increasingly filter, order and, ultimately, constitute everyday consumer experiences, as a sort of 'technological unconscious' (Beer 2009). While digital technologies and the access-based economy have once been heralded by promises of technology-enabled consumer empowerment, democratization, or the triumph of 'collective intelligence', such visions are turning out to be deceptively misleading in today's world. Instead, it looks like ongoing cultural production is headed in a bold new direction that is already challenging (or at least partly replacing) human agency and intelligibility. As a result, it is worth asking if what we buy online or eat for dinner has become less a matter of our choice and more the computational result of digital platforms' 'production of prediction' (Mackenzie 2015). Also, to what extent is our musical taste a mere consequence of YouTube or Spotify's automated recommendations (Airoldi 2021a)? Are we truly becoming emancipated in the 'networks of desire' that propagate automated, calculated, and optimally triggered Instagram images (Kozinets, Patterson and Ashman 2017)?

Despite the important resonance of such questions in the social sciences (Fourcade and Johns 2020; Benjamin 2019; Beer 2017, 2013; Mackenzie 2015; Bucher 2012a), the algorithmic mediation of consumer culture has not yet been adequately considered in consumer and marketing research. Regarding online platforms and digital consumption, the consumer culture literature is conflicted on explaining the liquefying and empowering implications of digitalization on the one hand, and the potentially disempowering implications of a 'datafied' consumer culture and manipulative surveillance capitalism on the other. In the first case,

processes of digitalization and the platform economy are portrayed as enabling ‘liquid’ forms of consumption (access-based, ephemeral, de-materialized, individualized), which potentially emancipate consumers from social and geographical boundaries while creating value (Bardhi and Eckhardt 2017; Bardhi, Eckhardt and Arnould 2012; Hoffman and Novak 2018; Kozinets et al. 2017). In evident contrast to this view, critical research on digital marketing and big data has highlighted that consumers’ empowerment may rest on an illusion powerfully maintained and facilitated by the marketers, while in reality platform users are increasingly under companies’ data-driven control (Thompson 2019; Darmody and Zwick 2020; Zwick and Denegri-Knott 2009).

In this paper, we argue that this theoretical dilemma, which opposes consumer empowerment to marketers’ control in the age of platforms, can be partly overcome by examining how algorithmic systems ‘articulate’ (du Gay et al. 1997) consumption and production processes within digital environments. Instead of broadly discussing the digitalization of markets (Hagberg and Kjellberg 2020), or the many applications and implications of AI technologies (Amoore and Piotukh 2016; Neyland 2019), we focus on the machine learning algorithms ordinarily encountered by digital platform users (e.g., on social media, search engines, streaming, and e-commerce services), and theorize them as non-human mediators that actively shape consumer culture (Airoldi 2022; Fourcade and Johns 2020; Morris 2015). By historically contextualizing, defining, and illustrating the algorithmic mediation of digital consumption, bridging social science and marketing literatures on the topic, our paper aims to conceptualize the rise of a new form of ‘algorithmic culture’ (Striphas 2015), one that dialectically embraces both platform-based marketer ‘nudges’ and consumer agency (Darmody and Zwick 2020). Inspired by the ‘circuit’ model of consumer culture (du Gay et al. 1997), we contribute to consumer and marketing research by conceptualizing *algorithmic articulation* as a dialectical and techno-social negotiation process, that allows us to enhance our understanding

of platform-based marketer control and consumer resistance. Through examples from existing literature, we then illustrate how algorithmic articulation works at the individual, collective, and market level. Ultimately, we suggest that dynamic machine learning processes within digital market infrastructures affect consumption in ways that cannot be entirely reduced to a top-down marketing manipulation, nor to a bottom-up consumer emancipation. In doing so, this article contributes to earlier theoretical discussions by envisioning new directions in the study of algorithmic consumer culture.

2. Rising Platform Economy and Liquefying Consumer Culture?

Consumer research addressing the postmodern condition of consumer culture – now boosted by the powerful forces of digitalization and the platform economy – has suggested several pathways for considering the emerging logic of consumption and consumers’ role and agency¹ within it. In some contrast, recent critical commentaries have also stressed marketers’ increased power via deployment of big data analytics, surveillance, and manipulative techniques by means of digital and automated ‘intelligent’ marketing systems.

Recent literature has suggested a profound shift towards liquid consumption, which is an increasingly ‘ephemeral, access-based, and dematerialized’ way of consuming (Bardhi and Eckhardt 2017; Bardhi, Eckhardt and Arnould 2012) that is enabled by digital media but also encouraged by the global mobility of people, who seek instant and continuous access to products and services wherever they go. In this novel paradigm, it is argued, the solid, stable, and physical nature and materiality (of consumers’ possessions) are replaced by inherent fluidity, immateriality, and instantaneity – by which consumption happens (Bardhi and

¹ The notion of agency here refers to ‘the physical or mental ability, skill or capability that enables actors to do something. The actor is assumed to proceed under his or her own volition, or at least without the permission of others’ (Arnould 2007, 97).

Eckhardt 2017; Molesworth, Watkins and Denegri-Knott 2016). Thereby, it should be underlined that increasing liquidity eliminates and resists not only solidity, but also sources of security, stability, and value for the consumer. Further, this suggests that consumers' identities and even social positions and structures are likely to liquefy – in other words, become more ephemeral and unstable, due to the weakening of traditional institutions and traditions in the sense that they can no longer serve as 'frames of reference for human actions and long-term projects' (Bauman 2007, 1). This development is inherent not only in Bauman's thinking, but also in the works of Featherstone (1995), Firat and Venkatesh (1995), and Firat and Dholakia (2006) among others, who foreground the idea of a deterritorialized, fragmented, empowered, and (more or less) 'sovereign' consumer subject (Holt 2002) that is in 'control' of his/her consumption decisions, expressions, and identity (Denegri-Knott, Zwick and Schroeder 2006).

A related stream of research has further strengthened the idea of the liberation and emancipation of consumer identity, desires, and experiences that have been expanded by computer-powered networks and AI connectivity (Belk 2013; Kozinets et al. 2017; Hoffman and Novak 2018; Puntoni et al. 2021). First, the work on the extended digital self (Belk 2013) presents a host of new means and potentiality for consumers to agentially extend their identities via new digital platforms and devices. In this context, consumer desire has been framed as energetic, connective, systemic, and innovative impulses that drive and unleash the passion to consume, which is amplified and liberated to the extreme when re-connected to the machinic circuits of digital technologies and platforms (Kozinets et al. 2017). Similarly, new forms of online connectivity, exemplified by the Internet-of-Things (IoT), are seen as revolutionizing consumer experiences by decentering them as part of 'intelligent' human-non-human networks of objects, services, and brands (Hoffman and Novak 2018), with new kinds of 'benefits and costs' for the individual (Puntoni et al. 2021). In terms of consumers' agency, such interpretations of consumption assemblages are viewed primarily in terms of their capacity

to enable and liberate: they provide opportunities for self-extension and communal self-expansion through digitalized networks of smart objects and humans.

Other prior research has shown many compelling examples of the ‘empowering’ effects of digital technologies and practices, including selfies (Kedzior, Allen, and Schroeder 2016), or the re-balancing of consumer-brand (power) relationships (Rokka and Canniford 2016). It has been found that digital platforms exert influence on perceived personal empowerment (Tiidenberg and Gòmes-Cruz 2016) or constructions of gender (Burns 2015). Yet, while some of these ‘effects’ can be perceived and experienced by consumers, it seems likely that the mechanisms of influencing, and more specifically the opaque power of algorithms and ‘black-boxed’ automated systems (Pasquale 2015), remain poorly understood – by consumers but also by scholars. For example, the way the Facebook feed is dependent on what kinds of content the user has interacted with will recursively impact the kind of content he/she will see in the future (Bucher 2012b); this is likely to create cultural ‘filter bubbles’ (Pariser 2011), with evident impact on unfolding cultural production (e.g., types of content being privileged) and ways of relating (e.g., types of people, ideology involved), which are orchestrated by the algorithm.

In marketing literature, however, critical perspectives on the subject have recently emerged. First, there is agreement that increasing control and surveillance over datafied consumers is at the heart of new digital marketing logics (Ball 2017; Cluley and Brown 2015; Deighton 2019; Zwick and Denegri-Knott 2009; Thompson 2019; see also Zuboff 2019). This can lead to the risks associated with consumers’ experiences of personal data exploitation, misunderstanding, or alienation (Puntoni et al. 2021). The literature has also exposed the idea that marketers benefit from and actively facilitate myths of the digitally ‘empowered consumer’, and that ‘good’ and autonomous consumer decisions are ‘decisions designed by computational marketing analytic systems’ (Darmody and Zwick 2020, 10). Consequently, as convincingly argued by Darmody and Zwick (2020), the digital marketing era actually rests on

the *contradiction* that increasing marketer control produces an autonomous and agentic consumer subject.

This critical literature has mainly focused on theorizing the extraction of ‘big’ consumer data through forms of ‘surveillance’ (Deighton 2019; Ball 2017; Zwick and Dholakia 2004; Thompson 2019), benefits and costs linked with AI consumer experience (Puntoni et al. 2021), or digital marketing practices (Darmody and Zwick 2020). Yet no theories discuss the broader impacts of automated systems on the level of consumer culture. So far, only a few articles have tackled this issue more than tangentially, such as Wilson-Barnao’s work (2017) on how algorithmic recommendations come to shape consumers’ access to art collections in Australia and New Zealand.

In what follows, we wish to consider and develop a more holistic framework, one that would enable cultural examinations to account for both the forms of control exerted by platform algorithms on consumers, and the spaces of resistance left in algorithmic consumer culture. In doing so, we take inspiration from du Gay et al. (1997), who advocate that a more comprehensive analysis of consumer culture would require the examination of ‘articulations’ of connections *in-between* consumption (including consumers’ identity negotiation and representation of meanings) and production of culture (marketers’ production of means and meanings of consumption). Here, ‘articulation’ refers to the ‘form of the connections that make up a unity of two or more distinct elements, under certain conditions’ (1997, 3). Thus, rather than privileging one single narrative of digital consumption – such as the optimistic illusion of consumers’ sovereignty (Holt 2002) or the myth of big-data manipulation (Thompson 2019) – we shed light on the dialectical techno-social processes that shape algorithmic consumer culture. The following section briefly outlines the historical grounds of this algorithmic mediation of consumption, aiming to clarify the changing meanings attached to the umbrella term ‘algorithm’ (Seaver 2017), and illustrate why the sociotechnical evolution toward

platform-based machine learning systems bears enormous implications for consumer research and the social sciences more broadly (Gillespie 2014).

3. Algorithms and Consumers: A Short History

Algorithms can be defined as computational recipes, that is, step-by-step instructions for transforming input data into a desired output (Gillespie 2014). Since their analog origin in the ancient world (Chabert 1999), these mathematical procedures have seen a tremendous technological evolution and a parallel multiplication of application contexts, with important consequences for institutions, companies and, especially, consumers.

During the 19th century, algorithms were still executed manually by human professionals known as ‘computers’ (Chabert 1999), while electro-mechanical computing machines were about to be developed, driven by a pressing scientific, administrative, and economic need for efficient information processing. The diffusion of business accounting machines and calculators in the early 20th century brought algorithmic computation into ordinary people’s lives for the first time. However, data were transformed and elaborated solely through analog means (e.g., punched cards and paper tapes). It is only in 1946 that the modern electronic computer made its appearance, making it possible to design algorithmic models, run them, read input data, and write output results in digital format, as combinations of binary numbers stored as ‘bits’ (Campbell-Lelly et al. 2013).

From that moment on, algorithms have been inextricably linked to a new discipline: computer science. Technological innovations enormously increased the processing power of hardware, previously limited by material constraints. In the late 1970s, the development of microprocessors and subsequent commercialization of personal computers fostered the popularization of computer programming. Algorithms were not merely about numbers and abstract calculations anymore: the digital storage of information, as well as its creation and

circulation through novel networked channels, such as the nascent Internet-based communication technologies, were generating brand new types of input data, deriving from the datafication of online behavior (Zwick and Denegri-Knott 2009). These ‘user-generated’ data became commercially relevant starting in the mid-1990s, when the rapid multiplication of web pages led to a pressing need for indexing solutions capable of overcoming the growing information overload experienced by Internet users. Systems for automatically detecting ‘spam’ emails were first developed. Page and Brin designed an algorithm capable of autonomously finding ‘needles in haystacks’ (MacCormick 2012:25), which then became known as PageRank and was used by Google Search. Meanwhile, e-commerce websites were experimenting with automated marketing strategies for targeting consumers and providing product recommendations (Ansari, Essegaiier and Kohli 2000). By the 2000s, the World Wide Web had substantially mutated into an ‘electronic marketplace’, that is ‘a vast network of consumer and product databases’ (Zwick and Dholakia 2004). The commercial Web 2.0 became populated by active ‘prosumers’ interacting on platforms such as MySpace, YouTube, Facebook, and Twitter. Ads and content recommendations began to be tailored to the digital traces of consumers’ discourses and behaviors (Airoldi 2021b), automatically stored and computationally analyzed in order to predict desires and elicit purchases or engagement (Mellet and Beauvisage 2020). Once embedded in the networked infrastructure of the Internet, algorithms turned into ‘operational’ marketing devices (Mackenzie 2018): their output, i.e., predictions formulated based on platform users’ behavioral data, were actualized in real time through the unsupervised ranking and filtering of digital content, tacitly ordering consumer experiences (Zuboff 2019).

Later, the ubiquitous diffusion of smartphones further increased the access rate to digital platforms worldwide. Algorithms started to be fed with behavioral traces extracted from novel sources, such as sensor data derived from IoT objects (Hoffman and Novak 2018; Deighton

2019). The unprecedented volume of data ‘mined’ from digitally mediated activities, together with the increased availability of ‘cloud’ computational power, made possible a new ‘socio-technological revolution’. That is, the ‘harnessing of human cognitive resources’ by AI systems (Mühlhoff 2020), which are ordinarily trained on vast amounts of data produced by consumers who are largely unaware of their unpaid digital labor (Casilli 2019). Advanced machine learning methods paved the way for the development and commercial implementation of AI technologies which, far from simply following top-down rules designed by programmers, inductively ‘learn’ from consumers (Airoldi 2022). This epistemological shift, from the ‘symbolic deduction’ of rule-following algorithms to the ‘statistical induction’ characterizing new machine learning systems (Pasquinelli 2017), entails unexplored implications for consumer culture: rather than simply executing pre-determined scripts, the artificial agents employed by Amazon, TikTok, Facebook, Google Search, Instagram, Spotify, Netflix or YouTube dynamically interact with consumers, evolving based on their data patterns, and often producing surprising or inexplicable results (Campolo and Crawford 2020). The resulting forms of governmentality and cultural production represent major subjects of critical inquiry in the social sciences.

4. Algorithms, Culture and Power

In the social sciences, a cross-disciplinary strand of literature known as ‘critical algorithm studies’ critically discusses the cultural roots and social implications of algorithms (Airoldi 2022; Neyland 2019). Here, we conceptualize these contributions to point towards four main controversial dimensions of the automated systems incorporated in digital services and consumer devices: their opacity, authority, non-neutrality, and recursivity.

Opacity. Being commonly developed by private companies for business purposes, the code and computational activities of platform-based algorithms are largely opaque and ‘immune from scrutiny’ (Pasquale 2015, 5). Secrecy is justified by the fact that these systems represent strategic assets for companies (Hallinan and Striphas 2016). Not only ‘the criteria by which algorithms determine evaluation are obscured’ (Crawford 2016, 86), but the consumer surveillance activities producing input and training data are as well (Zuboff 2019; Mühlhoff 2020). Opacity is also linked to computational complexity. In the case of advanced artificial intelligence techniques, such as neural networks, the behavior of the machine is not entirely understandable, not even by developers (Campolo and Crawford 2020; Pasquinelli 2017). For this reason, scholars and practitioners launch calls for ‘opening the black box’ and making algorithms accountable (Noble 2018). Even the output of computation creates forms of opacity: for instance, digital content algorithmically judged as ‘irrelevant’ will become, as a result, invisible to the user (Amoore and Piotukh 2016, 5; Bucher 2012b).

Authority. Whether automated machines have the capability to express or enable forms of power and authority is another issue debated in this literature (Beer 2017). Platform-based algorithms govern consumers’ digital experiences through automated classification and recommendation practices (Mackenzie 2006; Cheney-Lippold 2011; Morris 2015; Airoidi 2021a). Such an algorithmic authority is believed to carry disruptive implications for the notion of agency, which necessarily becomes a techno-social interplay: ‘an algorithm selects and reinforces one ordering at the expense of others. Agency, therefore, is by definition contested in and through algorithms’ (Mackenzie 2006, 44). Algorithms are widely portrayed as powerful social actors that shape possibilities and limit agency (Beer 2013, 69). This implies that algorithms not only mediate but ‘constitute’ human lives (Beer 2009, 987), acting as ‘a kind of invisible structural force that plays through into everyday life in various ways’ (Beer 2013, 69). In the literature, the opacity of algorithmic governance has often steered comparisons with

Foucault's panoptical views of society (Cheney-Lippold 2011; Bucher 2012b). However, recent empirical works have highlighted how consumers actively attempt to make sense, in a bottom-up way, of the obscure functioning of platform-based technologies, such as the recommender algorithm of Spotify (Siles et al. 2020) or the advertising systems of Facebook and Instagram (Ruckenstein and Granroth 2020).

Non-neutrality. Algorithmic authority also derives from the fact that computational outputs are presented as the mathematical outcome of a scientific, automated, and thus allegedly objective process (Mackenzie 2006; Beer 2013; Gillespie 2014). However, critical scholars have demonstrated that, far from being neutral technologies, algorithmic systems heavily depend on cultural assumptions inscribed in mathematical models and datasets (Neyland 2019; Benjamin 2019), as components of complex sociotechnical "assemblages" (Schwennesen 2019; Seaver 2017). According to Mager, 'capitalist ideology gets inscribed in search algorithms' (2012, 770), and the same happens in the case of platform-based metrics, such as 'like' buttons (van Dijck 2013). The non-neutral character of algorithms is particularly evident considering the human-generated data employed to train and calibrate machine learning systems, which are largely derived from Internet sources, or produced by low-paid 'clickworkers' – for instance, those annotating texts, images or audio files on crowdsourcing platforms like Amazon Mechanical Turk (Casilli 2019; Mühlhoff 2020). The cultural biases inscribed in training and input data eventually end up reinforcing gender, class, and racial discriminations (Benjamin 2019). For instance, Noble (2018) painstakingly illustrates how the stereotypical social representations of African American women historically at the root of US culture are amplified by Google Search results.

Recursivity. The automated iteration of procedures is one foundational characteristic of algorithms (Chabert 1999, 4). When the output of a computational process itself becomes embedded in the input of a new iteration, the algorithm is called 'recursive' (Beer 2013, 78-

79). In the case of the algorithms embedded in online infrastructures, some scholars have stressed how such recursivity may have broad social and cultural implications (Hallinan and Striphas 2016; Beer 2013; Fourcade and Johns 2020; Airoidi 2022). Consider the case of YouTube videos as an example. Two YouTube videos are likely to be ‘related’ by the platform’s recommender system if they are co-viewed by many users. However, related videos are also the main source of video views (Airoidi, Beraldo and Gandini 2016). Since users largely rely on them to decide what to watch next, this is likely to generate a ‘closed commercial loop’ that, iteration after iteration, strengthens past consumption patterns (Hallinan and Striphas 2016, 6), eventually ‘normalizing’ them (Mackenzie 2015, 442). Similar feedback loops are also established in the case of other platforms and digital services (Beer 2013, 81; Bucher 2012b), and lie at the very core of the ‘extractive’ processes of surveillance capitalism (Zuboff 2019, 68).

This means that, as Kitchin and Dodge put it, ‘the models analyze the world and the world responds to the models’ (2011, 30). Whether the ‘world’s response’ is intentional – i.e., SEO techniques aimed to deliberately please search engines (Mager 2012), or not – i.e., the unaware adaptation of musical taste to automated recommendations (Airoidi 2021a), the result is essentially the same. That is, ‘the world starts to structure itself in the image of the *capta* and the code’, and thus ‘a self-fulfilling, recursive relationship develops’ (Kitchin and Dodge 2011, 41). The societal result of this techno-social interplay has been referred to in the sociological literature as an ‘algorithmic culture’, reduced to ‘the positive reminder resulting from specific information processing tasks’ (Striphas 2015, 406).

However, it is important to note that computational models ‘respond’ to the world as well. In fact, recursivity also works the other way around: consumers iteratively influence algorithmic behavior through their explicit or implicit feedback – i.e., their (more or less aware) datafied reactions to algorithmic outputs, such as hiding a Facebook ad or skipping a

recommended song (Fisher and Mehozay 2019; Bucher 2017). Based on such real-time inputs, machine learning systems adjust their models, aiming to provide outputs more aligned with consumers' expectations – e.g., more videos of cats, less posts about politics (Fourcade and Johns 2020). Hence, we can argue that the learning algorithms ubiquitously embedded in platform-based feedback loops are to be seen neither as tools through which marketers' control is inexorably exerted on passive users, nor as technologies empowering consumers by humbly serving their needs and desires. By theorizing algorithms as 'generative' technologies (Beer 2009) that transform consumer culture through the active 'articulation' of consumption and production within digitalized markets (du Gay et al. 1997), we develop a framework for unpacking the recursive techno-social assemblages of digital platforms.

5. A Framework for Studying Algorithmic Consumer Culture

This section synthesizes previous sections and offers a framework that links insights from critical sociological studies of algorithms with the study of consumer culture. In doing so, we draw on the notion of consumer culture as a constantly evolving system of meanings, which shapes the way consumers make sense of their lives, identities, tastes, and consumption practices in broadly similar terms, and is the result of an ongoing negotiation by both consumers and marketers (du Gay et al. 1997; Hall 1997; 1980; Rokka 2021).

Specifically, we are inspired by 'the circuit of culture' – one of the foundational frameworks to guide any comprehensive cultural analysis (du Gay et al. 1997; see also Hall 1997). Conceiving consumer culture operating as a 'circuit' recognizes the interconnected and overlapping processes of production, circulation, and consumption through which any cultural products, artefacts, identities, and representations are constantly articulated. This analytical lens was introduced and made popular by the iconic *Sony Walkman* case study (du Gay et al. 1997),

which helped problematize unidirectional ‘meaning transfer’ models and sociological analyses focused on marketers’ production of culture as the ‘prime determinant of meaning’ (3). This case study illuminates how consumers effectively decode and negotiate marketers’ meanings, and how they also articulate entirely new meanings through everyday signifying practices – for example, the way they used the Walkman to transcend boundaries of public and private spaces when travelling on a crowded train, or when listening to music while running or at the office.

Articulation receives a specific meaning here: it captures the iterative social interactions and signifying practices through which meanings associated with a consumption object or practice become inscribed into consumers’ lifeworld, identity, and representations, and how they consequently circulate into the media and inform marketers’ ensuing cultural production. Articulation refers to the assembling process ‘connecting disparate elements together to form a temporary unity’ (3), for example, a selfie-image posted on online networks that assembles various visual, textual, material, and embodied elements from everyday life to express an identity. ‘It is a linkage which is not necessary, determined or absolute and essential for all time; rather it is a linkage whose conditions of existence or emergence need to be located in the contingencies of circumstance’ (Hall 1996). Instead of privileging one kind of articulation – of the marketer *or* the consumer – the circuit of culture framework fosters an analytical focus and insights on the iterative combination of recursive articulation processes by different market actors.

We argue that the circuit model is advantageous when examining how algorithmic systems affect consumer culture. First, it offers a holistic and dialectical view of consumer culture, which advances a cultural analysis that is sensitive to the articulative moments of the processes of production, circulation, and consumption through which specific cultural objects, identities, or practices gain their meaning (see Molesworth et al. 2016). Second, it recognizes the dialectical interplay between resistance and incorporation, agency and structure, as it ‘never

loses sight of the conditions of existence which both enable and constrain practices of cultural production and consumption’ (Storey 2003, 51; see also Holt 2002). For instance, Scherer and Jackson (2008) offer a critical analysis of Adidas’s commodification of Maori culture in the case of the worldwide ‘All Black’ advertising campaign, which generated controversy and outright resistance in the local context of the indigenous people. It is here that we find an insightful path towards the examination of the algorithmic mediation of consumer culture: in essence, algorithms are devices through which the articulation happens and power operates, but they can also be resisted in a number of ways, which end up affecting their operations.

This leads us to consider a new dynamic that is increasingly shaping the circuit of consumer culture: *algorithmic articulation*. While it is not our intention to entirely revise or further extend the earlier models of the circuit of culture (du Gay et al. 1997; 2013), nor is it possible for us to fully address the processes of production, circulation, and consumption through empirical investigation at this time, we wish to conceptually clarify what seems to happen in between these articulative moments and processes, and what kind of cultural implications there may be². In this sense, we view platform algorithms as non-human ‘intermediaries’ (e.g., Negus 2002) that operate in between the processes of production and consumption. This view echoes a number of contributions in the social sciences depicting algorithms as ‘infomediaries’ (Morris 2015) that increasingly substitute human intermediaries within digitalized markets (Hallinan and Striphas 2016; Beer 2013; see also Airoidi 2022).

These considerations urge us to reconsider the way that a cultural product, object, or practice is marketed and consumed, as in the middle we often have multiple algorithms

² We propose algorithmic articulation to differ from ‘articulation’ as broadly defined by du Gay et al. (1997) before the advent of algorithmic media. While articulation refers to any cultural negotiation process that connects disparate elements together in a specific cultural circumstance (for instance, a lifestyle expression), thus privileging human sense-making, algorithmic articulation is a techno-social process mediated and actualized by the opaque, authoritative, non-neutral, and recursive actions of automated systems. A characteristic of algorithmic articulation is the sheer speed of calculation and computing power, that allows to extract and connect elements in a blink of an eye – which is likely to accelerate the articulation processes at hand.

intervening and modifying its circulation and symbolic articulations. As illustrated in Figure 1, we conceive the dynamic of algorithmic articulation as depending on a multitude of *recursive* past iterations of consumer behaviors and human-machine interactions through digital data (for example, clicks, online purchases, or any other datafied digital activity). The input data is computationally processed by the algorithmic ‘black box’ in a (usually) *opaque* way, producing new *authoritative* articulations. These output predictions – typically nudges towards new consumption choices, recommendations, lifestyle representations, or identities – are optimized, normalized, and made attractive by the algorithm’s learning. As explained above, algorithmic articulations are inherently *non-neutral*, as (commercial) algorithms depend heavily on organizational goals, but also on cultural assumptions embedded in the data. Once consumers act upon the output predictions, they create new data, which are instantly drawn as the input for the next iteration ... towards algorithmic consumer culture.

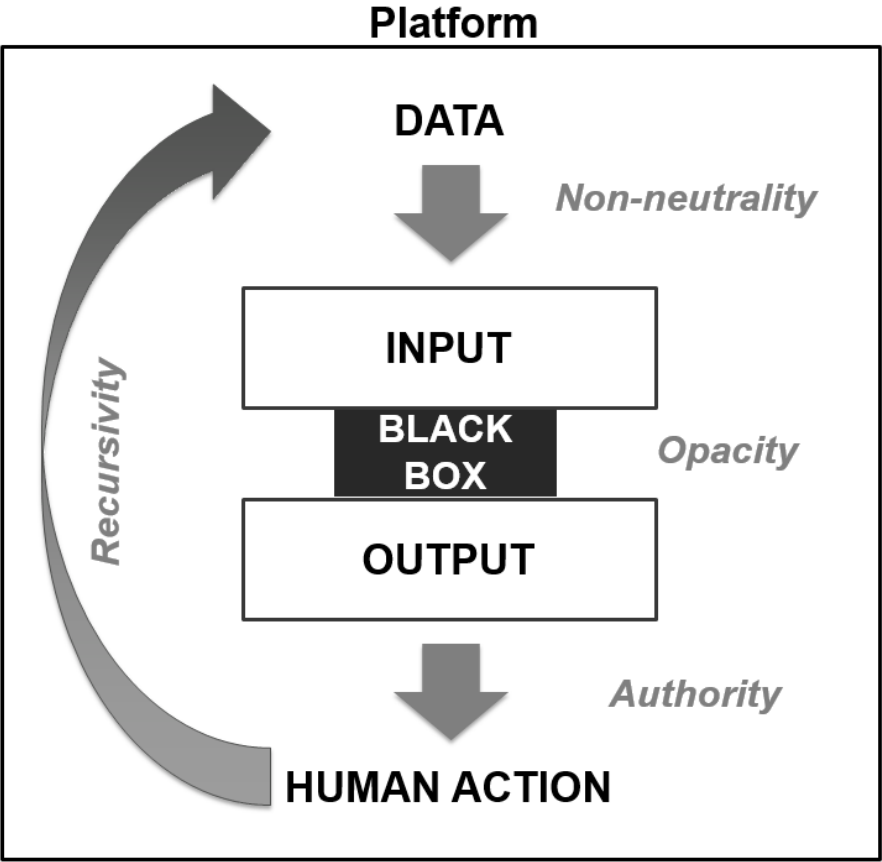


Figure 1 Recursive loop of mutual influence between platform users and algorithms

For example, the algorithms of search engines process past digital inputs, including representations (e.g., Google Images), and articulate their ranking and visibility in future search results. Consequently, they influence the person searching for them, and potentially affect their ideas about possible or suitable choices – but also their understandings about desirable/undesirable constructions of gender, race, or age. Another example is Facebook’s advertising, which targets extremely specific social groupings and types of people towards products, brands, and lifestyle choices, based on algorithmically optimized ads. These ads employ indices and associations in historical data, to further strengthen and forge the articulations in terms of their quality and effects – for example, by optimizing what kind of advertising visual is more likely to lead to an engagement with a specific kind of person. In both examples, which are discussed in more depth in the following section, each new iteration is fed back into a recursive loop that further distills and develops algorithm learning.

Here stands the dialectical character of our framework. On the one hand, platform algorithms control and constrain us, by ordering the social world³. On the other hand, the algorithmic articulation happens recursively and always in relation to behaviors and reactions of the ‘humans in the loop’ (Mühlhoff 2020). This means that algorithms are also subject to consumer adaptation, negotiation, and new forms of resistance to marketers’ control.

Next, we build further on this dialectical view of algorithmic consumer culture, by offering examples from other fields and new research avenues for CCT scholars.

³ As Mary Douglas (1966, 94, cited in du Gay et al. 1997) puts it: ‘order implies restriction; from all possible materials a limited selection has been made and from all possible relations a limited set has been used. So disorder by implication is unlimited, no pattern has been realized in it, but its potential for patterning is indefinite. This is why, though we seek to create order, we do not simply condemn disorder. We recognize it is destructive to existing patterns; also that it has potentiality. It symbolizes both danger and power.’

6. Algorithmic Articulation: Between Control and Resistance

We have argued that algorithmic consumer culture can be seen as the result of a process of *algorithmic articulation* that mediates between marketers’ control and consumer resistance, in the context of digital platforms. We will now examine this continuous interplay by considering three analytical levels of consumer culture – that is, individual, collective, and market-level (see Figure 2) – and outline possible research directions through practical examples drawn from a multidisciplinary literature.

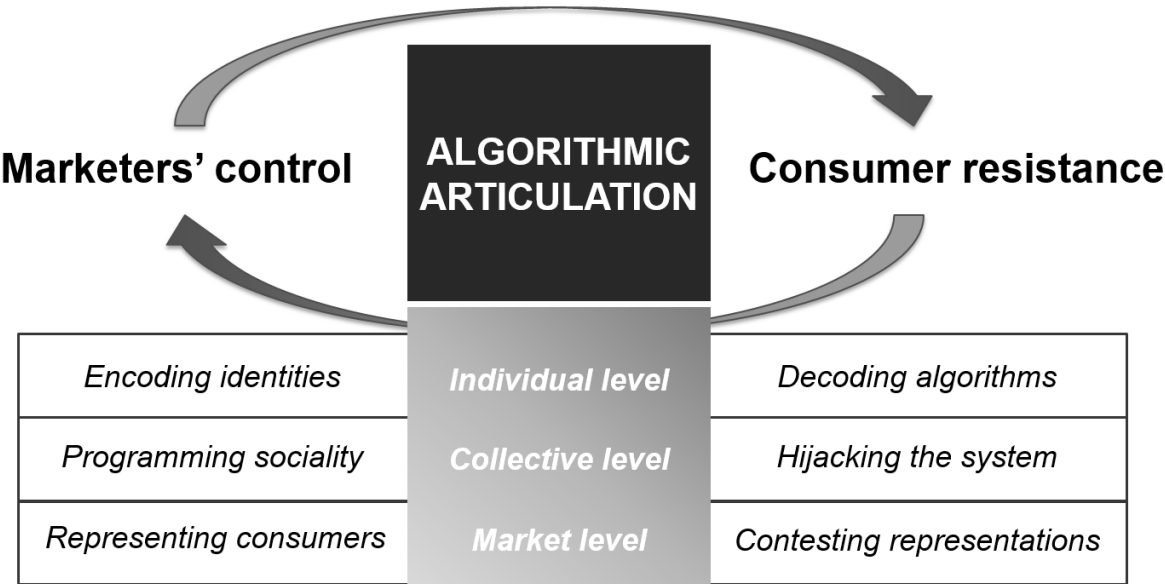


Figure 2 Articulation of algorithmic consumer culture, on the individual, collective, and market-level

Individual Level: Encoding/Decoding

As we have argued above, algorithms exert multiple forms of control over individual consumers. Digitalization renders consumption easier to surveil, model, and orient for marketing purposes (Deighton 2019; Zuboff 2019; Ball 2017; Zwick and Denegri-Knott 2009; Cluley and Brown 2015). Online algorithmic systems allow computational marketing techniques that create highly personalized consumer realities in real time, with the aim of

manipulating choice; these are also called ‘hypernudges’ (see Darmody and Zwick 2020, 3). Behaviorally targeted ads – such as those famously used by the controversial British company *Cambridge Analytica* to pivot votes for Trump’s presidential campaign and Brexit (Rokka and Airoidi 2018) – are an example of how algorithms are ordinarily used to ‘hypernudge’ individual choices. The idea behind behavioral targeting is to access consumers’ intimacy to the point of ‘not just knowing [...] historical and present preferences, activities, locations, desires, communications and so on, but [...] future ones too’ (Darmody and Zwick 2020, 7). Therefore, digital marketing turns into the ‘encoding’ (Hall 1980) of predicted consumer identities (Cheney-Lippold 2011; Kotliar 2020; see also Zuboff 2019): intimate individual information is computationally digested as input, to opaquely generate a personalized output, such as micro-targeted ads. As a result, consumer desires are likely to become swiftly aligned with the marketing goals put forward by the machine, to then be datafied and, again, digested in a new iteration. When this happens, algorithms end up working as consumers’ ‘technological unconscious’ (Beer 2009).

However, it is important to note that micro-targeted ads are not ‘magic bullets’ that, once they reach their target, would wield an immediate persuasive power. Curiously enough, such a discourse can nevertheless be identified in the media, and not least promoted by the marketers themselves (Rokka and Airoidi 2018; Thompson 2019; Bruns 2019). Not only can predictions on consumer identities be inaccurate or clearly biased, but, more importantly, consumers can be reflexive about algorithmic systems, for instance in trying to make sense – or ‘decode’ (Hall 1980) – how they work in grassroots ways (Siles et al. 2020; Bucher 2017). Marketing research has shown that consumers are often aware of the social labels implicit in micro-targeted ads (Summers, Smith, and Reczek 2016), and may choose to ‘resist’ automation (Leung, Paolacci, and Puntoni 2018). In a recent paper, Ruckenstein and Granroth (2020, 18) document that positive responses to micro-targeted ads are much less common than negative

ones. These range from ‘fearful reactions [...] triggered by online targeted advertising that mimics the user’s past behavior, thereby generating unpleasant sensations of being surveilled’, to the irritation directed toward misrecognition and stereotyping, as when ‘young women complain that they are continually informed about beauty products and pregnancy tests’. The frequent *decoding* of algorithms by individuals opens up spaces of resistance that may counterbalance marketers’ control. For example, consumers might block ads through specific browser extensions, refuse ‘cookies’ (Mellet and Beauvisage 2020), or deliberately provide incomplete or incorrect information on online forms and profiles. However, the stark informational asymmetries between all-knowing digital marketers and opaquely nudged users underline the degree of ‘algorithmic awareness’ to properly decode platform-based control a privilege reserved to digitally literate consumers (Gran, Booth and Bucher 2020). Therefore, consumers’ negotiations of misaligned algorithmic outputs may remain entirely implicit, such as when one distractedly hides a disturbing Facebook ad, or ignores an automated recommendation. Nonetheless, even these unreflective reactions produce datafied feedback that affects algorithmic behavior in a novel iteration of the circuit, thus pivoting the algorithmic articulation toward the consumer-empowerment end of the continuum – for example, by providing more ‘relevant’ and ‘pleasing’ content in the future (Ruckenstein and Granroth 2020).

How does the recursive algorithmic articulation between individual consumers and the behaviorally targeted content they digitally interact with unfold over time and across platforms? How does algorithmic articulation make us feel (Beer 2016)? What are the consequences for consumer identities, desires, and tastes (Airoldi 2021b)? Also, how do consumers’ degree of ‘algorithmic awareness’ (Gran, Booth and Bucher 2020) and *decoding* practices influence online consumption choices and experiences? To what extent do personal feelings and affects toward the potential risks of AI and platform surveillance (Puntoni et al. 2021) link to consumers’ social backgrounds, cultural values, and habitus? Furthermore, in what ways do

different types of learning algorithms employed in digital markets ‘see’ consumers (Fischer and Mehozay 2019) as they *encode* their datafied identities? These are among the many relevant and yet largely unexplored questions concerning algorithmic articulation processes at the individual level.

Collective Level: Programming/Hijacking

Social exchanges are deeply engineered within social media and messaging apps. Algorithmic systems control consumers’ platform sociality in ‘modular’ and dynamic ways (Zwick and Denegri-Knott 2009). In fact, what happens on Facebook, Instagram, TikTok, Tinder, or Twitter is that the degree of visibility of specific social media posts and contacts largely depends on past interactions among users and engagement with content (Bucher 2012b). Since the very same visibility of posts and contacts is the main driver of future social exchanges, multiple techno-social feedback loops are established, with resulting forms of sociality thus becoming computationally ‘programmed’ (Bucher 2012a) through algorithmic articulations. Users will chat and interact almost exclusively with a small subset of their social media contacts, which are pre-filtered in opaque ways, while the rest of their social networks will be digitally invisible. People and opinions included in these personalized ‘filter bubbles’ (Pariser 2011) are likely to be those each user usually agrees with – this leading to the formation of ‘echo chambers’, isolated groups of like-minded people which are believed to amplify political polarization (Bruns 2019). Although service providers commonly frame the automated filtering of content as aimed at prioritizing users’ satisfaction and ‘meaningful interactions’⁴, their main business goal is to maximize advertising revenues as well as usage time, which is vital for the accumulation of consumer data (van Dijck 2013; Bucher 2012b).

⁴ See Mark Zuckerberg’s statement on the change of the Facebook newsfeed in 2018: about.fb.com/news/2018/01/news-feed-fyi-bringing-people-closer-together

Still, there is evidence that consumers can collectively escape algorithmic control, by appropriating platform logics and using them to their own advantage. In fact, since most content-filtering algorithms on social media work by analyzing aggregated consumer activities in real time, coordinated shifts in collective behavior can produce bottom-up counter-manipulations of algorithmic results. This possibility of *hijacking* algorithms is well exemplified by fandoms on Twitter: Arvidsson and colleagues (2016) show how digital crowds of Italian pop music fans were able to exploit the algorithmic logics of the platform in order to generate ‘bursts of affective energy’ via the specific use of hashtags and mass-retweeting of content related to their musical idols. Since Twitter topics or hashtags that are highly retweeted or mentioned in a short time span are identified by a ‘trend algorithm’ (which compiles the lists of the top 10 ‘trending topics’ per country), it was possible for fans to ‘push’ their favorite content up to the top of Italian and then global Twitter trends. Such a collective appropriation of algorithmic systems, employed for the ground-up affirmation of sociality rather than for its top-down and marketing-oriented ‘programming’ (Bucher 2012a), represents a consumer form of ‘algorithmic resistance’ (Velkova and Kaun 2019).

How do consumers thus collectively negotiate algorithmic outputs? When do they *hijack* automated systems within digital markets, in order to pursue logics in contrast with marketers’ aims? How do forms of ‘programmed sociality’ (Bucher 2012a) resulting from platform-based control affect collective manifestations of consumer culture, including communal consumption practices (Schau et al. 2009), assemblages (Canniford and Bajde 2016), or brand publics (Arvidsson and Caliandro 2016)? And in what ways do these more or less ephemeral consumer publics, communities, or ‘crowds’ (Arvidsson et al. 2016) exploit the recursivity of algorithmic articulation to resist marketers’ control and get empowered? Similar questions resonate widely in the social sciences literature (Velkova and Kaun 2019), and especially in social movement studies (e.g., Milan 2015). Future CCT work could significantly

contribute to this direction of inquiry by highlighting the centrality of consumer collectives within market-based processes of algorithmic articulation – even beyond the specific case of platform algorithms. For instance, the recent example of consumers collectively organizing on Reddit to *hijack* algorithm-dominated financial markets and push GameStop’s stock price against the interests of hedge funds (Koebler 2021) could be analyzed from this novel perspective.

Market Level: Representing/Contesting

Finally, at the level of the market, marketers’ control is often exerted through the automated manipulation of cultural representations (du Gay et al. 1997). In fact, one of the main activities of algorithmic systems is the classification and ranking of datafied manifestations of human culture (Beer 2017; 2013). Their ‘similarity’ or ‘relevance’ are ordinarily assessed computationally, and the results of the calculus contribute to the algorithmic constitution of consumer imaginaries (Beer 2009). This happens all the time with recommendation systems, which establish an affinity between products and customers, thus implicitly prescribing and, ultimately, ‘manufacturing’ predictable lifestyle behaviors (Zwick and Denegri-Knott 2009; Beer 2013, 97; Mackenzie 2018; Hallinan and Striphas 2016). The algorithmic articulation of market representations is even more evident in the case of Internet search engines. Search algorithms, such as the aforementioned Google PageRank, dynamically associate an ordered selection of web pages to specific keywords and queries, based on rules aimed to privilege the relevance of search results and authority of sources. However, far from being neutral, this sociotechnical process tends to *reproduce* those cultural logics and biases already present in the searched online content. The book *Algorithms of Oppression. How Search Engines Reinforce Racism* (Noble 2018) provides many examples on this. By showing how the innocent search for ‘black girls’ on Google leads to a wide array of pornographic and discriminatory content,

Noble traces search bias back to social structures and inequalities, which get ‘reinforced’ by the stereotypical social representations proposed by the search engine. According to Noble (2018), the reason why search results suggest that a doctor is white and male (82) and African American women are sexual objects (67) lies in the long-lasting structural racism and sexism characterizing the US cultural context – which get inscribed into the input of algorithmic calculation and amplified by its supposedly objective output.

However, on the level of markets and imaginaries, consumer resistance can be exercised by *contesting* discriminatory algorithmic representations. The ‘World White Web’ project, illustrated by Velkova and Kaun (2019), is a thought-provoking case in point. In 2015 Johanna Burai, a Swedish artist and visual designer, used search engine optimization (SEO) techniques to get pictures of black hands among the top results of the Google query ‘hand’, previously leading to white hands only. Differently from regular uses of SEO marketing, which basically aim to deceive search algorithms in order to gain an advantage in visibility (Mager 2012), here the purpose is political: to fight against the racial biases of algorithms. After an initial *decoding* of the logics of Google Image Search, the artist launched an activist campaign that spread pictures of black hands throughout the web, also involving top-ranked websites and established media outlets. In a few months, her images topped Google’s results for the query, leading the artist to conclude: ‘Together, we can change Google’ (Velkova and Kaun 2019, 11). The public contestation of algorithmic systems entails an appropriation of their computational logics, aimed to transform markets and technologically mediated imaginaries from *within*. Again, the algorithmically mediated negotiation between the non-neutral market representations baked into computational models and consumers’ bottom-up contestations of such techno-social outcomes opens up a number of theoretical questions relevant to CCT and consumer research more broadly. For instance, could the algorithmic *reproduction* of stigmatizing social representations, such as those discussed by Noble (2018), contribute to a ‘solidification’ of

otherwise ‘liquid’ consumption patterns (Bardhi and Eckhardt 2017) along the structural lines of race, gender, or class? What are the implications of algorithmically articulated market representations on ‘technologically enhanced’ consumer desires (Kozinets, Patterson and Ashman 2017)? Key theoretical questions also arise in relation to how consumers’ *contestation* of algorithmic articulations can be examined from the point of view of consumer morality (Giesler and Veresiu 2014), marketplace ideology (Thompson 2004), market systems (Giesler and Fischer 2017), branding (Arvidsson and Caliandro 2016; Rokka and Canniford 2016), or consumption assemblages (Canniford and Bajde 2016; Hoffman and Novak 2018).

Concluding Remarks

A comprehensive conceptualization of algorithmic consumer culture has been missing from prior consumer research and marketing literature, despite the increasing focus on the digitalization of both consumption and marketing practices. This paper theorizes algorithmic consumer culture as the outcome of dialectical techno-social processes of *algorithmic articulation* in the context of digital platforms. Dialectical, in the sense that we recognize the agency of both marketers and consumers, and their mutual influence and input processed through a circuit of culture that shapes contingent individual, collective, and market-level outcomes (see Figures 1 and 2). Techno-social, on the other hand, since we consider the opaque mediation of non-neutral, authoritative, and recursive automated systems (see Section 4).

If it is true that ‘algorithms and their users co-construct and counter-curate each other’ (Velkova and Kaun 2019, 2), algorithmic consumer culture remains nonetheless far from ideals of consumer sovereignty and emancipatory liquidity. The asymmetries of power between platforms and their users, which are also linked to the opacity of algorithmic authority, make

digital consumers more similar to the dominated inhabitants of Baudrillard's hyper-real society (1993) than to the liberated and passionate subjects often portrayed in the current consumer culture literature. However, it is important to bear in mind that new forms of consumer resistance readily exist, including individual reflexivity (*decoding*), collective action (*hijacking*), and transformative intents (*contesting*), as we have illustrated. Notably, we argue that these resistant practices have the potential to limit the mechanisms through which platform surveillance and marketers' control operate. Further research is needed to detail such complex and iterative influences, across and in between different consumption activities and digital infrastructures.

Our article makes several contributions to existing theoretical debates. First, we problematize the liquefaction of consumption (Bardhi and Eckhardt 2017; Bardhi, Eckhardt and Arnould, 2012) and networked consumer-emancipation theories (Belk 2013; Kozinets, Patterson and Ashman 2017; Hoffman and Novak 2018; Kedzior, Allen and Schroeder 2016; Tiidenberg and Gòmes Cruz 2015), which thus far over-emphasize consumers' experiences of an illusion of empowerment and emancipation. Our framework stresses the dynamics through which algorithms produce a 'technological unconscious' (Beer 2009), a force that has been shown to significantly downplay consumers' agency, and instead of liquefying social structures might contribute to their 'techno-social reproduction' (Airoldi 2021a) – for example, by amplifying cultural biases regarding gender, class, and race (Noble 2018; Benjamin 2019).

Second, we cast some doubt on the theories of automated digital marketing and big-data driven consumer surveillance (Darmody and Zwick 2020; Zwick and Denegri-Knott 2009), which thus far envision and assume a great 'manipulative' power for the algorithmic marketing systems, one that rips all agency from consumers. Our work details how the algorithmic articulation of digital markets allows space for resisting consumer practices, which are datafied and then baked into future human-machine interactions. It is important to notice, though, how

the informational asymmetries between platforms and their users normally limit consumers' 'algorithmic awareness' (Gran, Booth and Bucher 2020), and that the digital literacy, skills, and reflexivity required to coordinate collective or market-level consumer reactions to algorithmically-enabled control may not yet be accessible to wider consumer groups and populations. Nevertheless, a fascinating opportunity already exists for future research on algorithmic resistance, which is still poorly understood and theorized (Velkova and Kaun 2019; Milan 2015), especially in the field of consumer research (Leung et al. 2018).

Overall, we address the prior conflicting theoretical views of the dis/empowering effects of digitalization. Our theoretical framework offers a potent resolution that explains algorithmic consumer culture as a dynamic circuit involving a multitude of dispersed, algorithmically mediated cultural articulations, which cannot be fully understood by focusing analytical attention solely on consumers or on marketers' viewpoints. We suggest that future research considers the market centrality of specific algorithmic technologies from an eminently cultural standpoint, as powerful 'participants' in social life (Neyland 2019, 11) which behave according to culturally rooted 'dispositions' acquired from human-generated data and models (Airoldi 2022). This perspective is very much in line with post-human and 'flat' ontological standpoints at use in consumer research (e.g., Bajde 2013; Hoffman and Novak 2018).

We also contribute by elaborating our framework towards a potential future agenda for consumer culture theorizing (Figure 2). Specifically, we highlight that more research is needed to unpack the recursive and relational mechanisms at play within platform-based 'algorithmic assemblages' (Schwennesen 2019). On the one hand, sociotechnical assemblages such as those lying behind the dialectical process this paper theorizes can (and should) be broken up into less abstract and better researchable 'pieces' – i.e., the algorithm, the marketer, the consumer, the data, and the ever-changing interactions among them (Airoldi 2022). Divergent moments of control and resistance on the individual, collective, and market level warrant further empirical

and conceptual work. On the other hand, analytical attention is needed on how algorithmic articulation intervenes in an increasing number of existing consumption assemblages, not least in how elements and connections between them are integrated, stabilized, or destabilized (Canniford and Bajde 2016; Rokka and Canniford 2016) – for instance, how wearable technologies intensify the centrality of competitiveness and socializing around the practice of running (Akdevelioglu et al. 2021). It strikes us, however, that the sheer speed, complexity, and opaqueness of machine learning algorithms have arguably made the circuit of algorithmic culture much more challenging to study (Campolo and Crawford 2020; Kotliar 2020). While the specific methodological issues are beyond the scope of this paper, the review offered indicates new methods, including the ethnography of algorithmic systems (Neyland 2019; Seaver 2017), which have not yet received adequate attention by consumer culture scholars. We see this as a window of opportunity for investigating – but also resisting – the firm grip that algorithmic consumer culture already has on us. As Holt pointed out while discussing postmodern consumers’ ‘sovereignty inflation’ (2002, 87): ‘consumers want to author their lives, but they increasingly are looking for ghostwriters to help them out’. Algorithms play a powerful role as such ghostwriters today.

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