

## Video Screen Interfaces as New Sites of Media Circulation Power

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This article examines the screen interfaces that have become central to the experience of television, film, and video content in an era when Internet-distributed video coexists with older technologies. We outline how these interfaces represent new sites of *media circulation power* in their ability to direct audiences toward certain kinds of experience and content, and therefore away from others, power that we contextualize in the longer term history of media industries. We identify multiple levels of video interface: those provided by various video devices, those offered by video services, those of marketplaces that sell services, and aggregated interfaces that blend all of these activities. We identify mechanisms of circulation power that can be applied to all of these interface types, including interface placement, recommendation, search and other functions, and metric display power. We conclude by outlining some ways in which policy and regulation might respond to these emerging forms of media circulation power, and the implications for research on streaming services and other developments in the media industries.

*Keywords:* interfaces, video, television, film, circulation, search, algorithmic recommendation

Interfaces, such as those of the home screens of smart TVs, streaming media players, set-top boxes, and gaming devices (such as the Apple TV device interface shown in Figure 1), as well as of video streaming services such as Netflix and BBC iPlayer (Figure 2), and video marketplaces such as Amazon Channels (Figure 3), have become crucial nodes by which viewers discover and access video content. Device interfaces offer an array of services, and service interfaces offer an array of programs and films, but recent

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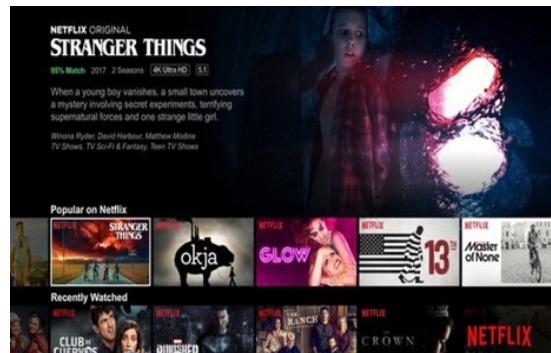
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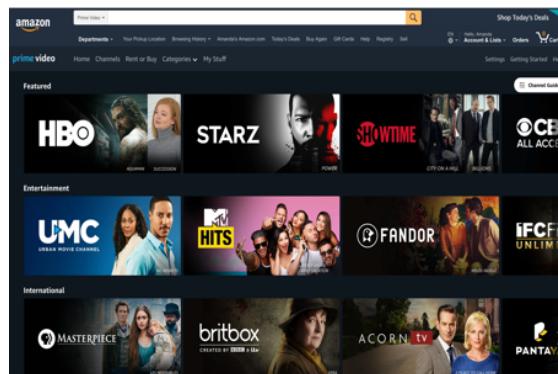
innovation has made multifaceted, “aggregated” interfaces (Figure 4) increasingly common. These offer both programs and services.



**Figure 1. Device interface: Apple TV.**



**Figure 2. Service interface: Netflix.**



**Figure 3. Marketplace interface: Amazon Channels.**



**Figure 4. Aggregated interface: Amazon Fire homepage.**

These interfaces extend the mechanisms used to channel viewer attention, which began with practices of scheduling that were represented in printed channel listings and then significantly developed by the interfaces of electronic programming guides (EPGs) in the 1990s and 2000s. But contemporary screen worlds also include interfaces that have less precedent, particularly those used to select among the growing universe of services. Teasing apart the differences among interfaces and, more important, the underlying industrial operations that produce them is crucial because these interfaces involve new manifestations of *media circulation power*. In essence, this is the power to direct audiences toward certain kinds of experience and content, and therefore away from others.

The current moment in television is one of considerable complexity, and the relationship among devices, apps, and interfaces has not been definitively established. Significant audience segments continue to view linear television, others consume a diet of only Internet-distributed services, and many a combination of both. Some view only on a television set; others view on mobile devices, tablets, or computers. Some rely on the software integrated in television sets that is able to display both over-the-air and Internet-distributed services; others use multichannel set-top boxes, or gaming and streaming devices such as Roku or Amazon's Fire TV Stick to access Internet-distributed services. This level of pluriformity—in which a mix of devices and distribution technologies leads to viewing experiences governed by a range of devices, Web browsers, and sometimes apps—may be an aberration, arising from the fact that new technologies are still being adopted (Spar, 2001). Nevertheless, the cultural issues at stake cannot be ignored until a more uniform ecosystem is established.

Despite the fluidity of competitive dynamics and inconsistency of practices, it is clear that new mechanisms of circulation are shaping the consumption of video and that these mechanisms are significant to establishing the future of the video landscape. This article identifies how interfaces channel the experiences of video viewers, distinguishes the mechanisms of circulation power that operate, and explores how the interfaces incorporate these mechanisms of power. Our focus is not on the computational design of algorithms that determine the often-personalized recommendations in a given viewer's interface, but instead on the strategic decisions and arrangements between device manufacturers and video streaming services that direct the form and content of user interfaces. The video app is clearly an important site of study (C. Johnson, forthcoming), but our analysis focuses on devices and interfaces.

Our approach to studying these interfaces concentrates on how they operate as hubs of media circulation power, the role they play in broader processes of video production, circulation, and consumption, and their related consequences, rather than on their form or design or on audience use and interpretation of them. Building on contributions from the political economy of media and culture (Garnham, 1990; Ryan, 1992), we use *circulation power* to refer to the powers that media industry firms involved in production and circulation can exert over creators, audiences, and the media environment in general (see Hesmondhalgh, 2019, pp. 93–99 for further discussion).

We proceed as follows. First, we explain the policy, industrial, and cultural significance of the issues examined here. We then contextualize these emergent forms of circulation power within the historical development of television. The third section presents the main analysis structured through a typology of interfaces and examination of the industrial dynamics supporting them. We identify three distinct mechanisms of circulation power deployed through these interfaces and illustrate their operation. These mechanisms are interface placement; recommendation, search, and other functions; and metric display power. In our conclusions, we summarize implications of our analysis for future research.

### **Context and Significance**

While a great deal of sociological research has examined the decisions that have shaped media production and circulation, little is known about the corporate arrangements between devices and services, reflecting the *opacity* of many of the new cultural intermediaries that now participate in media circulation. As we enter the third decade of the 21st century, politicians and policy makers are discussing whether and how to regulate the new video landscape that has emerged from the recent entry of IT corporations into media and communication. Recently, video screen interfaces have become an issue of major interest to regulators, as broadcasters face new challenges in making audiences aware of their products (European Union, 2018; Ofcom, 2019). The key terms used in these recent policy interventions have been *discoverability* and *prominence*. Discoverability concerns how institutions might ensure that their content is found by audiences in an era of ever greater video abundance; prominence concerns the degree to which certain kinds of channels and services (and therefore content) stand out from others in guides, interfaces, and so on. In the UK, the 2003 Communication Act required the communication regulator Ofcom to ensure that a set of designated channels (public service and local) were given “appropriate prominence” on electronic programming guides. Recently, Ofcom has consulted on how the “prominence regime” needs to be reconfigured for a new world of video access (Ofcom, 2019). Discoverability and prominence have significant industrial and cultural dimensions. Culturally, viewers’ ability to find and select content strongly influences the kinds of cultural experiences they will have. In the pre-Internet environment, the small number of viewing options made it likely that anything scheduled would be viewed by a significant audience. In the current video landscape, program selection remains consequential, and prioritization has become key. Merely being available in a library of programs means relatively little; such programs must also be discoverable.

In terms of industrial implications, discoverability and prominence connect with a long-standing set of problems regarding power that have been analyzed through the lens of discussions about media circulation. Certain contributors to the field and approach known as political economy of media have long taken the view that while the power to produce cultural goods is obviously important, circulation is often

even more crucial (Garnham, 1990). For example, even if production costs fall, enabling more and more smaller and “alternative” producers (including amateurs and semiprofessionals) to enter cultural markets, such producers often cannot gain attention and resources to the same degree as larger companies. Those bigger firms tend to have much better access to key sites of circulation, such as prominent positions in broadcast schedules or prime slots in retailers. Moreover, in video streaming, it is increasingly the case that the largest producers also control circulation—a form of vertical integration. We prefer the terms *circulation* and *circulators* to *distribution* and *distributors* here; *circulation* provides a more encompassing term, whereas *distribution* denotes particular practices in media operations, such as the movement of physical goods (newspapers, books, CDs), or particular distribution technologies, as in Internet-distributed video.

Producers of cultural products, on the one hand, and those who circulate them, on the other, often operate in separate businesses, separate institutions, or, in some cases, separate parts of the same firm. When it comes to the stage when those products need to go out into the world, the circulating firm often makes the decisions about marketing and publicity that will have a major influence on the audience that the product will reach—its size, its demographic composition, and other audience attributes. These factors are crucial to “success,” and success begets additional opportunities or reward for producers. Even in digital contexts in which production is often relatively accessible and affordable, the key challenge for producers remains that of *finding an audience* amid the abundance of product available. Access to circulation in the form of having a program selected for inclusion in a channel’s content persists as a challenge of linear circulation, but discoverability has become the crucial problem within the very large libraries of video that Internet distribution makes available, especially for an open access service such as YouTube (Christian, 2018).

Circulation power thus remains a vital point of analysis for assessments of media industries—and video screen interfaces are now key sites of such power.<sup>2</sup> Sometimes that power is “deployed” strategically and deliberately by powerful industrial actors (and therefore by the social groups associated with them). In other cases, mechanisms of selection and prioritization mainly “reflect” power imbalances elsewhere in industry, culture, and society—though the exercise of such power is not necessarily any less pernicious in such cases.

The circulation power of Internet-distributed video also extends beyond prominence and discoverability to include the control of information previously available to both producers and circulators. In the linear context, producers know when their programs are being offered, and public data inform them of the extent of viewership. This information is often a central measure of success that guides the continuation of current work and on which future opportunities depend. These processes are far more opaque in Internet-distributed video. Services often do not share information about the scale of viewing with producers, nor do producers know the extent to which their programs were recommended or otherwise made discoverable. Of course, these industrial implications have clear cultural ramifications; these industrial practices reshape measures of success for both services and creators in ways likely to affect subsequent production.

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<sup>2</sup> Circulation power is very different from Williams’ (1975/1990) conception of flow, which refers to a feature of (linear) television as opposed to other media, in that it attempts to connect individual “programs” into a sequence of viewing (pp. 85–107).

Somewhat different approaches from ours, including those from software studies, have sought to theorize how interfaces—as the tip of an iceberg of computing technologies—reconfigure people's lived experience of space and embodiment (see Farman, 2012) or, in more philosophical terms, how interfaces should be understood as processes, not objects, involving complex new forms of mediation rather than representation (Galloway, 2012). There is also a vast body of research from within computer science concerned with user interface (UI) design and user experience (UX) of interfaces that focuses on improving efficiency and manageability (Tidwell, 2011). Some contributions explicitly address television as opposed to screen interfaces (Lafferty, 2016).

Our approach here is more sociological in orientation, though not necessarily in contradiction with these other ways of analyzing interfaces.<sup>3</sup> It is rooted in media and communication studies and cultural sociology, and we particularly draw on and contribute to the fields known as media industry studies and political economy of the media. Our focus is on user interfaces, only one of a number of interface types (see Cramer & Fuller, 2008, p. 149), but the key type involved in media circulation power. It is consistent with approaches to critical analysis of apps (see Light, Burgess, & Duguay, 2018), but here with a focus on the industrial priorities that guide interface composition.

Analysis of video screen interfaces from media industry studies and political economy has so far only hinted at the issues of media circulation power that we explore in this article. A growing media and communication scholarship has analyzed interfaces provided by video services (rather than devices) and has considered the options made available to users and the outward design of some service interfaces (C. Johnson, 2017, 2019; McKelvey & Hunt, 2019). As with many media artifacts, varied traditions of inquiry take interfaces as their object of study, generating various research questions. Sanson and Steirer (2019), for example, analyze how Hulu incorporates aspects of the EPG's "live" schedule into its interface. Lobato (2019) considers how Netflix's changing interface represented a move from the aesthetics of video stores (vertical DVD-style boxes) toward "a horizontal frame suggesting frames on a celluloid filmstrip" (p. 43) downplaying the televisual aspects of the service. McKelvey and Hunt (2019) develop a vocabulary for some of the kinds of experiences that users have on such interfaces, such as going down "rabbit holes" (i.e., following curiosity through networks of interconnections). They also treat cultural platform interfaces as technologies of cultural discoverability—exploring how content creators find audiences for their products in the context of abundance that marks contemporary media, where users stream or download from vast online libraries of available material rather than choosing from a limited number of scheduled television channels, newspapers, etc. While focused on the form, design, and ideological work of interfaces, these contributions point toward our concerns with the forces shaping their operation, but do not attend, as we do here, to the production logics that govern interface design or the consequences for video circulation that arise from how interfaces are configured.

Closer to our concerns here are those raised in an early contribution by Chamberlain (2010), who discussed how the then newly evolving interfaces of Hulu and YouTube offered "a sense of individualized control over forces and quantities that seem unmanageable" (p. 86). For Chamberlain, the emphasis on

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<sup>3</sup> We use the term "interface" in this article mainly to refer more concisely to what are often called "user interfaces."

viewer control tended to discourage "a deeper interrogation" of the technological and industrial forces behind such interactions. It is precisely such technological and industrial forces that we seek to investigate in this article—including decisions about what happens in interfaces that, as far as we can tell, have hardly been discussed in the research so far. In a more substantial analysis, Catherine Johnson (2019) has examined a variety of video screen interfaces, arguing that they tend to "create an illusion of content and plenty" (p. 113). In contrast to Chamberlain, who understood the interfaces he analyzed as offering a new form of interactivity, Johnson claims that video screen interfaces actually work to minimize such interactivity "while creating an illusion of user agency" (p. 113) and have the potential to "exert significant control over what users watch by determining what content is prioritised in the interface" (p. 114).<sup>4</sup> We offer the first detailed investigation of such control, theorized in the context of media industry studies and political economy of media, and we extend coverage to a range of video interfaces.

### **Circulation Power and Video Interfaces: A Brief History**

The circulation power exerted through video interfaces is not without precedent. A variety of media and nonmedia contexts inform the analysis presented here. At the broadest level, video interfaces that sell services or programs fit within a tradition of retail behavior and can be understood through explanations of how shopping environments are shaped to encourage particular consumption. Many core features of physical goods' transaction are also present in digital worlds. Supermarket shelves offer a parallel context in which the retailer attempts to extract payment from goods' sellers and highlights at least three mechanisms of power: access to their shelves, prime shelf positioning, and strategic placement of store-brand goods. More specifically in relation to media industries, research on book, music, and video rental stores provides examples of this type of behavior amid physical retail (Herbert & Johnson, 2019). Examinations of the tactics and circulation power exerted by app stores are also relevant—particularly to video service marketplace interfaces. But because the app stores are so vast—offering between one and three million apps—discoverability operates differently and warrants much closer examination and specific theorization (Gillespie, 2018; Li, 2018; Morris & Elkins, 2015; Morris & Murray, 2018). App stores are, of course, key intermediaries of video services viewed on tablets and phones; however, our main focus here is on issues of circulation via interfaces displayed on television screens, which still constitute the majority of viewing, even in countries where habits have changed (for example, 67% of UK viewing in 2018 was on such television screens, as opposed to PCs, tablets, mobile phones etc., according to Ofcom, 2018).

Another important context for understanding discoverability and prominence on video interfaces is provided by the history of viewing guides. In the first decades of television, from the 1950s to the 1980s, viewers accessed schedules primarily via printed guides such as *TV Guide* or *TV Times* or listings printed in newspapers. Channel ordering was important in affording priority, but most guides simply presented channels in numerical order. In the United States and the UK, channel numbers were assigned based on regulatory arrangements of spectrum license, and so limited circulation power could be exerted.

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<sup>4</sup> A longer tradition of critical social science and humanities research also sees interfaces as offering a "veneer of simplicity" that conceals or obscures the complexity of what goes on behind them (e.g., Beer, 2008, on iPods).

The arrival of multichannel television created a greater need for assistance navigating programming options and therefore new configurations of circulation power. With the rise of cable and satellite in the 1980s and 1990s, printed guides were increasingly supplemented by electronic program guides (EPGs). At first, such electronic guides provided a nonnavigable scroll of programming over a fixed time. Derek Johnson (2018) dates the origin of the EPG to 1981, when United Video Satellite Group offered cable operators a service that "displayed a scrolling grid of program listings" (p. 12). EPGs became widespread in Europe and North America during the 1990s. Responsive interfaces provided increased functionality. Interactive EPGs gained increased functionality when incorporated into digital video recorder technology (DVR); in addition, a new generation of set-top boxes became more mainstream in the early 2000s as a way to organize television viewing and recording, whether on cable, satellite, or "free to air" digital television systems. Each of these developments slightly shifted the dynamics of scheduling and other forms of linear circulation power. EPGs were developed by companies separate from those distributing television channels and licensed as a service (Herbert, 2014), but increasingly became integrated and proprietary within particular technologies in the late 1990s, in the case of satellite and DVR services—although cable set-top boxes continued to license EPG services from third parties (D. Johnson, 2018).

EPGs, of course, are a type of video screen interface, but they provide highly standardized options rather than the personalized displays driven by recommendation and search algorithms that characterize contemporary video interfaces. Many EPGs enabled some search functionality, which can be understood as the beginning of a reconfiguration of navigation from linear, consecutive channel listings. Until the DVR and digital television reconfigured EPGs, advances in television interfaces and their functionality were controlled by multichannel providers or set manufacturers, and the range of interface innovation among multichannel providers was negligible. In the United States, cable services operated as geographic monopolies and without competition, and there was minimal motivation to improve the viewer experience (Lotz, 2016). The arrival of DVR devices such as TiVo and ReplayTV in the late 1990s—innovations introduced by new entrants from the consumer electronics sector—threatened the norms and operations of both television production and circulation companies and provided viewers with new interface types that facilitated richer metadata for searching and record functions. These innovations allowed viewers considerably more control over the viewing experience and the collection of much more user data by the companies controlling them (Hesmondhalgh & Lobato, 2019).

Printed program guides and EPGs are the precursors to video service interfaces (Figure 2), but precedents for video device interfaces (Figure 1) are less obvious. Television sets initially had no interface distinguishable from their programming: When a television turned on, it began playing what was being broadcast on the set channel. Indeed, television technology behaved in particular ways that scholars have rarely considered—such as automatically returning to the last channel viewed when a set was turned on—but the device itself did little to actively direct viewing.

### **New Mechanisms of Circulation Power**

Our claim is that video screen interfaces represent a new and evolving locus of media circulation power, and in this section, we illustrate and explore the implications of some of the key mechanisms of power involved. To be sure, mechanisms of circulation power characteristic of linear distribution

technologies, such as selection and marketing, persist in Internet-distributed video. However, in the new landscape of video competition, digital tools expand the influence of some of these mechanisms, while also enabling the emergence of other, new ones.

As indicated earlier, we organize this section through three mechanisms of circulation power that operate through video interfaces: interface placement; recommendation, search, and other functions; and metric display power. Our aim here is more a conceptual mapping of emerging forms of circulation power rather than a precise analysis of how such forms operate in particular interfaces. We explore instances of these mechanisms across various interfaces, including those of devices, services, and marketplaces. We acknowledge that recommendation overlaps substantially with mechanisms of interface placement, but we treat them separately here because different industrial practices support them. Search is an increasingly important way in which viewers find content, and in-built search tools such as predictive search can be used to recommend. Like much recommendation, search is dependent on algorithms. This mechanism of circulation power also encompasses other functions that are more expansive than the visual surface of the interface, such as trailer autoplay.

### ***Interface Placement***

Interface placement enacts circulation power by prioritizing some services and programs over others. Placement does not happen by chance, nor is it a neutral activity. Generally, interface placement is driven by two different commercial strategies. One aim follows from the use of paid placement in retail and treats interface placement as a revenue stream. For example, if Netflix is preloaded and optimally positioned on the home screen of a new television, Netflix likely paid the television manufacturer to be there. The interfaces of video devices—whether smart TVs, streaming devices such as Fire TV Stick, Apple TV, or gaming devices—typically follow this strategy to some extent.

Paid placement is used most extensively in the interfaces of video devices and can involve direct financial payment or bartering of services (typically promotion). The extent of paid placement is difficult to know because devices do not need to publicly disclose payments made to them. These industrial transactions have precedents in linear circulation and often involve more than simply whether a service is preloaded to a device interface. The complexity of these deals favors large multinational services because device manufacturers seek to limit the extent of country-by country hardware specificity (C. Johnson, forthcoming).

Device manufacturers determine the layout and arrangement of the home page in a manner that inevitably provides greater prominence to some services than others. For example, in Figure 1 and Figures 3–7, all the services shown are more discoverable than those that a viewer must scroll past this home page to find. Placement at the top of page and early in the queue is regarded as most desirable. Also, services seek to be accessible in as few clicks as possible (MTM, 2019).



**Figure 5. Samsung Smart TV interface (device, offers, services).**

Beyond paying for particular interface positions, services seek being preloaded on devices and often pay for it. Preloaded services already exist on the interface when the device is first turned on—they do not require any searching or downloading on the part of the viewer—and are also typically found in prominent home screen positions. All these techniques are aimed at encouraging use. Preloaded services are mostly the result of complicated transactions between device manufacturers and services. The deals can also include mechanisms that enhance discoverability, such as “deep linking” (the ability to go directly to specific content from the device home screen), data sharing, advertising deals, marketing, and billing arrangements (MTM, 2019). An example of deep linking appears in Figure 4; users can go directly to the programs in the first row, and the prominent *Bosch*, from the home screen. Notably, this Amazon Fire Stick interface features Amazon original series, suggesting a strong prioritization of the company’s exclusive, original content. Most video devices enable viewers to add beyond preloaded services, but in a situation in which many viewers are unaware or unsure of what services are available, preloading and prominent positioning in the interface provide considerable advantage and are key examples of contemporary circulation power.

Preventing particular services from being accessible through the video device interface—the opposite of providing prominence—is also a mechanism of circulation power. For example, until late 2017, the Amazon Prime Video app could not be accessed using Apple TV. A series of negotiations between Apple and Amazon, reportedly tied to Amazon’s refusal to sell Apple’s device and Apple’s failure to offer “acceptable business terms” for the service’s inclusion, were resolved in 2017 and probably explain the service’s debut

in the desirable top screen position (Ricker, 2017).<sup>5</sup> At the time of writing in late 2019, Netflix remains unavailable on the Apple TV app, which some suggest is because Netflix does not want to allow data about use to be made available to Apple (C. Johnson, forthcoming, citing Niu, 2019).

Another way to pay for prominence is through hardware shortcuts—such as a Netflix button on a remote control—that allow direct access to a service. Although technically a means of overriding the interface, hardware shortcuts offer another mechanism of circulation power appropriately conceptualized here. These shortcuts make some services easier to access and decrease the likelihood of viewers seeing—and thus choosing—other options. The mechanisms of interface placement that enable video devices to increase the prominence of particular services through home screen position, preloading, and hardware shortcuts, and to exclude services entirely, are striking illustrations of how their pursuit of revenue leads to interfaces that channel viewers toward particular services.

It is unclear whether services pay for placement in marketplace interfaces, as in the examples from Amazon in Figures 3 and 6. Note that in Figure 6, the “sponsored” box common for other paid placement of Amazon goods is not present. Rather, key interface placement here may result from the revenue-sharing relationship Amazon has with the services. Amazon may be motivated to tune algorithms to recommend services that a consumer is likely to desire based on past searching and purchase because Amazon receives a percentage of the revenue from subscription based on the typical structure of these deals. Or, Amazon’s recommendations may prioritize services that offer Amazon a high revenue share. Placement is thus not technically “paid,” but it is still tied to remuneration.

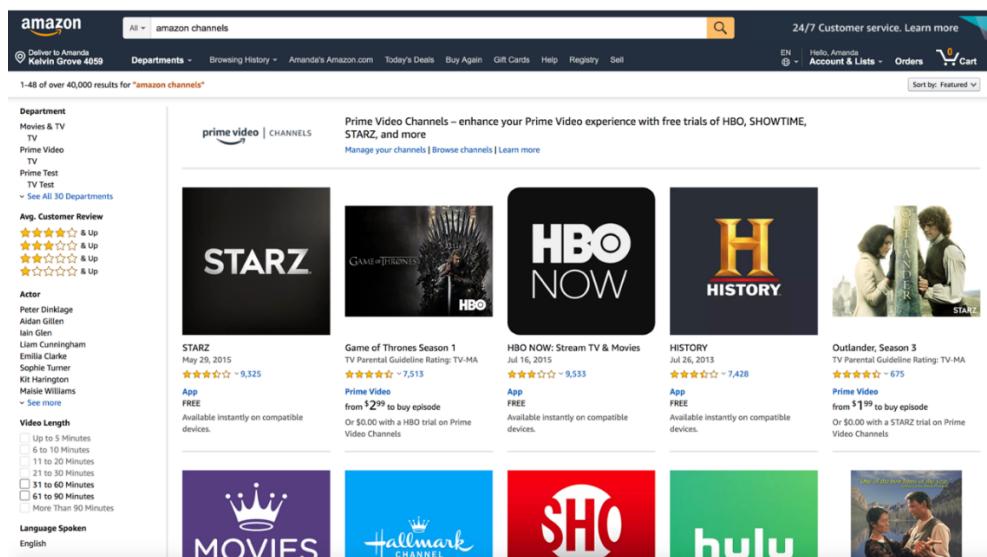


Figure 6. Amazon Channels interface search (website).

<sup>5</sup> In the case of Apple TV, later generations allow reordering or deleting, but the Apple-owned apps across the top cannot be deleted or moved (Ciprini, 2015).

It is also unclear whether programs are paying for placement in the emerging “aggregated” interfaces that include both programs and services (see the introduction). For example, Apple TV, shown in Figure 7, has updated its interface from that depicted in Figure 1 to prioritize particular programs at the top of the interface under headings such as “Up Next” and “What to Watch.”<sup>6</sup> To date, the particular strategies of different services can explain their prioritization of certain shows on their interface, as we discuss next. There is no regulation that prevents program producers and/or distributors from paying to have a series prioritized on an interface, nor policies requiring disclosure of this as paid placement. The recent expansion of aggregated interfaces has provided very valuable new opportunities for powerful companies to exert circulation power.



**Figure 7. Apple TV aggregated interface.**

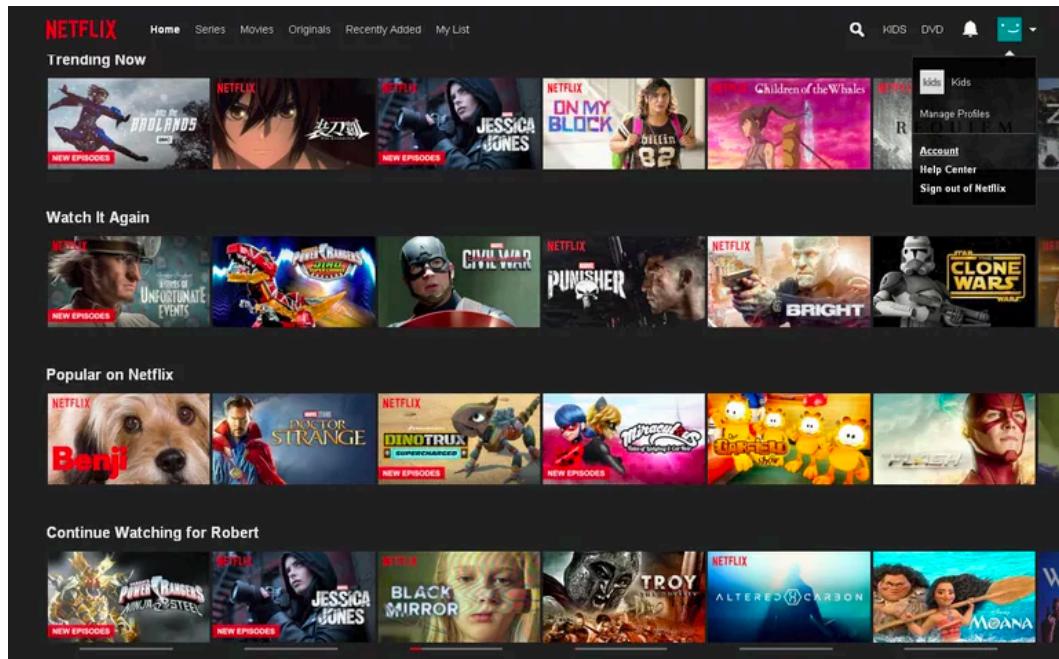
In contrast to the first aim of using interface positioning to produce revenue, the second aim uses interface placement strategically. Because there is so much variation in business model and content offerings—particularly among services—these strategies vary considerably, but they do not involve direct payment and are tied to the strategy of the company controlling the interface. Importantly, public service media that are driven by noncommercial goals also manage video interfaces according to different priorities.

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<sup>6</sup> Recent research on sponsorship of Spotify playlists by Benjamin Morgan (2019) identifies a similar case of new circulation power in streaming music. The dynamic is somewhat different because of the different remuneration of artists based on plays—heightening the circulation power in the case of music streaming—but he also notes the core issue of opacity regarding how songs are selected for inclusion on playlists.

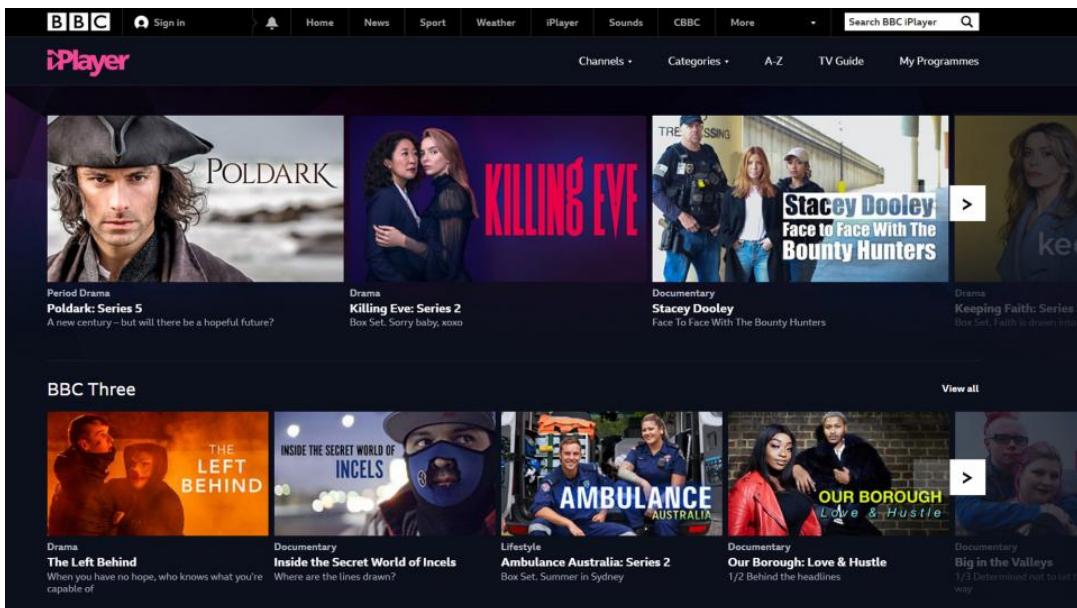
The value of prime interface placement is made clear by the fact that financial transactions commonly account for interface positioning on devices. Those in optimum position are more likely to be seen and sampled, creating a significant advantage for those most accessible. But what explains nonpaid placement? In these cases, the companies operating interfaces—most commonly services (Netflix)—use interface placement to advance their core organizational strategy, though these vary considerably. Although the service itself may receive no benefit based on which programs are viewed—because video services do not pay license fees based on use—there are still significant consequences that result from the circulation power of prioritizing some programs over others. Prioritized shows are more likely to be discovered, discovered shows are more likely to be viewed, and greater viewing translates into more opportunities for series creators and talent. Just as having a good spot on the schedule could be crucial to making and breaking careers, this too is the case with interface placement. Beyond this importance for producers, a service's interface—and the strategies behind it—reveals a lot about the mechanisms through which viewer attention is channeled in Internet-distributed video.

A brief survey of a few service interfaces reveals considerable similarity, but key differences. Netflix viewers first see highlighted a particular Netflix Original show (Figure 2), selected according to the viewer's previous use. A trailer for this show begins automatically. If viewers choose to scroll down the home screen, they will then see a series of rows, often based on genre. Some consist of programs and films selected according to algorithmic interpretation of the account holder's viewing history, with a particular group of shows or films recommended for viewing. Further down, viewers will find rows such as "Continue watching" (consisting of programs and films that the viewer has not finished watching) and, usually after four or five rows, a band of Netflix Originals, which are made more prominent by being shaped as vertical rectangles. Other standardized rows (i.e., row titles that everyone sees, rather than personalized row titles) include "Trending" and "Popular" (see Figure 8). Netflix typically features about 40 horizontally scrollable rows on each home page, depending on device, with anything between 20 and 70 videos per row (cf. Gomez-Uribe & Hunt, 2015).



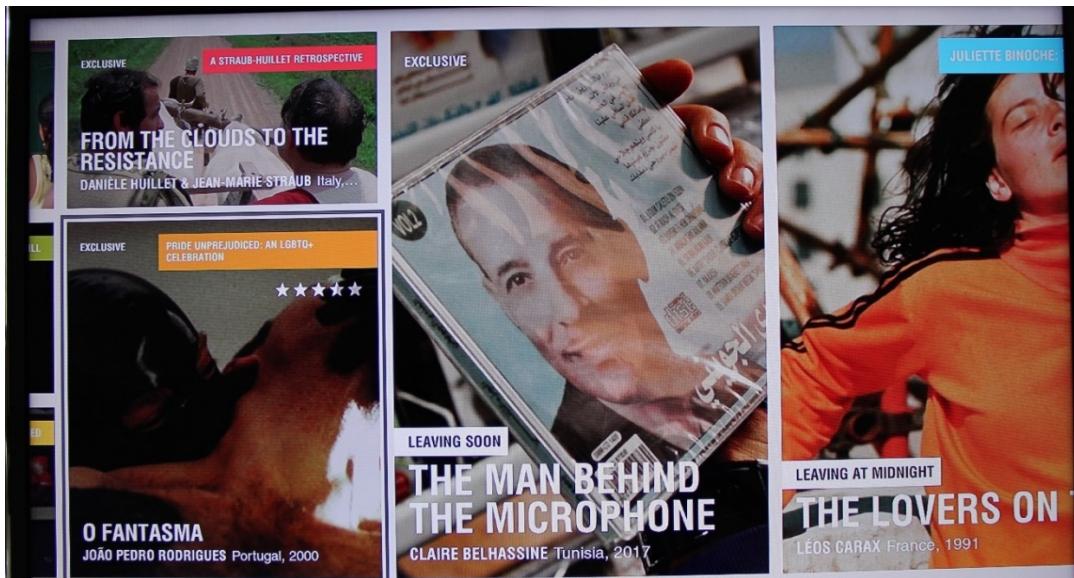
**Figure 8. Netflix home page (after scrolling down).**

A viewer accessing the homepage of the BBC's iPlayer (Figure 9) finds a rather similar format to Netflix—a series of rows of tiles that can be vertically and horizontally scrolled—and a similar mix of selected and algorithmically produced content recommendations. The range of programs that are offered in the interface varies because of the broader expanse of programming genres offered by the BBC's linear service and remit as a public broadcaster charged with representing many aspects of British culture and society. The service makes available video content shown on the various BBC television channels over the previous month, supplemented by a considerable amount of material from the BBC's vast archive.

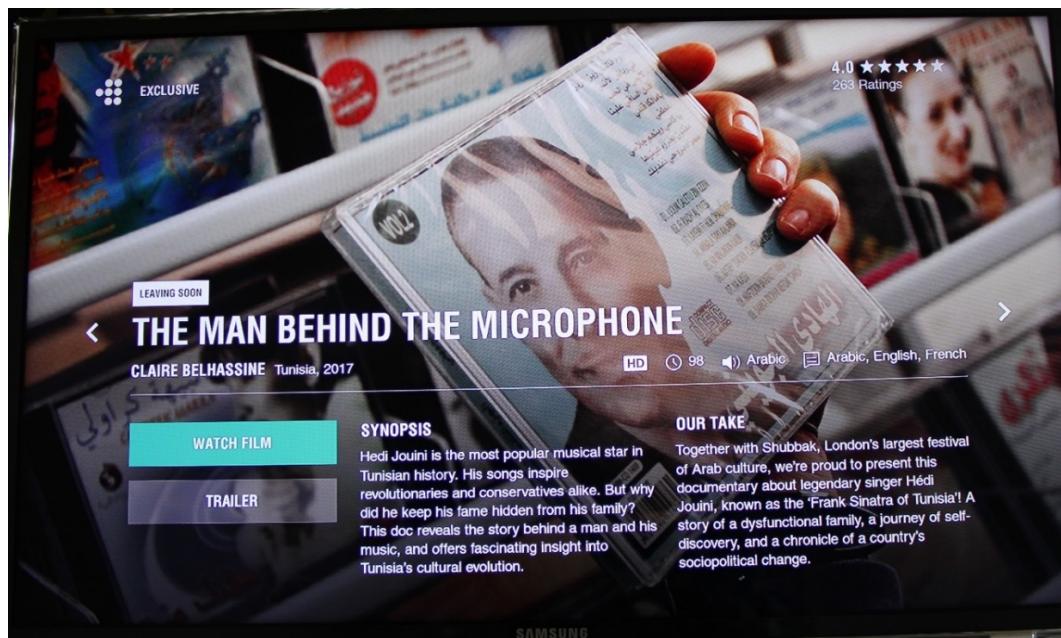


**Figure 9. BBC iPlayer home screen.**

A third and contrasting example of interface positioning comes from the film company MUBI, which offers two different services: a subscription video-on-demand (SVOD) service, available in 11 languages, and a catalog of transactional video-on demand (TVOD) films—though we only consider the former here. The SVOD service makes 30 films available at any time, each of which can be accessed for 30 days; one film leaves each day, and another arrives. The interface for the SVOD service consists of 30 tiles, forming a kind of conveyer belt where the film at the far right of the horizontal scroll of tiles is about to leave at midnight, whereas the film at the far left has just arrived (Figure 10). Clicking on a tile reveals a plot summary and a description of the film, along with user ratings, film length, and the name of the director (see Figure 11).



**Figure 10.** MUBI home screen (when scrolled fully to right).



**Figure 11.** MUBI film screen, with metrics in upper right corner.

This tour through the interfaces of three streaming services hints at both the variation and consistency in streaming service interfaces and ways the services can act as sites of circulation power through their interface placement. Why does Netflix prioritize its "Originals," iPlayer the very popular shows highlighted, and MUBI newly added films? What circulation power is being exercised in these choices? Netflix now spends 85% of its programming budget on Netflix Originals (Spangler, 2018) as it seeks to compete with the media conglomerates from which it had been licensing programming, many of which have now entered into the streaming service business themselves (most notably Disney). Netflix controls more rights to the series it funds and thus seeks for viewers to value these series over those licensed from others. Although the BBC iPlayer service is free, the BBC is compelled, like Netflix, to try to retain viewers. Unlike Netflix, it does so not to limit subscription drop-off, but to maintain its legitimacy as a media company funded from taxation (the compulsory UK license fee). Its choices for what content is highlighted in terms of positioning and recommendation on iPlayer are likely to have a strong bearing on what viewers to choose to watch, with consequences not only for viewers' cultural mix, but also for the producers from whom it commissions work. Choice is much more limited in the 30-title MUBI catalog, and there is greater equivalence in discoverability. The service arguably exerts minimal circulation power through its interface, but wields it mainly through its ability to choose which films to offer (and because MUBI also acts as a financier, it often shows films that it has supported itself, for obvious reasons).

Of course, many other video interfaces might be analyzed for the power exercised in placement decisions. A key question in assessing interfaces involves identifying whether placement is paid. If so, large established companies have marked advantages over start-ups, noncommercials, and niche services. The ability of the most recognizable and mostly highly capitalized services to stay "top of screen" provides hegemonic status despite the perception of some that there is greater choice and democratic access in Internet distribution. If placement is not paid, the key questions concern what business goals may be driving the organization, what the consequences might be for those companies/programs displayed and not displayed in the interface, and how these factors shape consumption.

### ***Recommendation, Search, and Other Functions***

From the available evidence, we could not identify instances in which recommendation, search, or other functions such as autoplay were driven by paid prioritization. Marketplace interfaces (Apple TV, Amazon Channels) are the most likely site of paid recommendation if it occurs. The logics guiding recommendation and search are also much more opaque than interface placement and thus difficult to analyze. This is partly because the details of how algorithmic recommendation systems and search engines operate are subject to commercial confidentiality, and partly because even software engineers and their managers are themselves often familiar with only one part of complex systems. Key questions here concern which entities are advantaged and disadvantaged by recommendation, search, and other functions built into interfaces. Like interface placement, recommendation and search contribute to making some programs and services more discoverable than others, and they produce similar cultural implications.

Research has shown that the results of recommendation and search algorithms depend on often problematic understandings of "relevance" (Gillespie, 2014). These are not best critiqued as "biased"—no "unbiased" results could exist. But they are deeply dependent on human and institutional decisions, including

interpretations of the behavior of users. We can briefly explore these issues by considering what happens when a user types “comedy” into Netflix’s search engine. What results appear and in what order? A vertically scrollable sequence of literally hundreds of programs and films appears, arranged in rows of three titles (see Figure 12). Of course, we can only guess at what previous viewing influenced the selection of these items above the hundreds of others that appear below them. In the “experiment” we conducted, why *Dirty Grandpa* and *Bad Moms*? (The mind boggles.) Yet regardless of whether placement is systemic in any way, it can strongly influence the chance of success of some products rather than others, which has implications for creators and audiences.



**Figure 12. Searching for “comedy” on Netflix.**

The recommendations offered by video services tend to combine personalization with popularity, with some notion of what might be shared with others—as suggested by the row titles categorized as “Popular” or “Trending.” As Tarleton Gillespie (2016) has shown, the use of algorithms to present what is “trending,” whether on social media or on streaming services, builds on long histories of how circulators or distributors have created “calculated publics” around their products. Displays of such trends depend on relatively new forms of automated recommendation (always with a very considerable degree of human agency on the part of circulators, an issue that is still very much under investigated in media industry studies). Automated *personalized* recommendation is arguably a more novel feature of the new video landscape, and it underpins a great many of the categories on interfaces. The benefits and problems of such personalization have, of course, been much discussed in research and journalism, including considerable coverage of Netflix itself (see Lobato, 2019, pp. 40–41); our focus here is on how such recommendation within interfaces serves as a form of circulation power.

Why is there such an emphasis on personalized recommendation on video service interfaces, and how might this illustrate the use of circulation power? It may derive from the fact that many such services are subscriber funded and so are much less driven by the need to maximize viewing for any particular program than linear broadcasters or cable operators are; for linear broadcasters and cable operators, higher advertising rates could be charged to advertisers for access to increased audiences, especially in more valuable (wealthier) demographic groups. In the world of subscriber-funded video streaming, what matters instead is that, across the many different market niches they seek to reach, viewers will continue to use the service. Netflix engineers Gomez-Uribe and Hunt (2015) parse their company's motivation in designing its homepage and directing targeted recommendations there as one of *spreading engagement across the catalogue*. This, they make clear, was understood by Netflix as an effective way to increase streaming hours, which in turn is seen as directly related to reductions in subscription cancellations and conversion of free trials into subscriptions. Video streaming interfaces, then, seek to spread engagement across the repertoire by making abundance manageable and negotiable through mixing personalization with indications of popularity. But they do so in a way that exercises circulation power on the basis of decisions that are extremely opaque to both users and content producers.

Another mechanism of recommendation on streaming service interfaces is automatic play function. For example, Netflix's interface launches a trailer as soon as users rest their remote control cursor on a programming "tile" for more than a very short period. The aim of the automatic play function seems to be to reduce browsing time; research suggests that with increased browsing time comes the risk of shifting to another service (Gomez-Uribe & Hunt, 2015). A similar principle underlies the function in YouTube whereby when one video ends, another—chosen algorithmically—follows. This is clearly tied to YouTube's advertiser funding and its incentive to keep viewers on the site longer to allow more commercial exposures. While many users in some markets are now prepared to pay for multiple services, streaming firms associate reduced engagement with their services with reduced subscription; therefore, keeping users on the same service is an important motivation behind the design of interfaces. But these features also, and more importantly, enhance the discoverability power of interfaces by *automating previewing*. Previews and trailers constitute a long-standing feature of video marketing because it is difficult for film and television viewers to have a sense of the pleasures afforded by any individual cultural product in advance of consuming it (Hesmondhalgh, 2019). On Netflix, video content highlighted for recommendation is promoted with particular intensity via automatic play, and this is a form of circulation power.

### ***Metric Display Power***

A final aspect of circulation power observable on video interfaces, one we have space to discuss only briefly here, is the ability to display "metrics"—numbers and rankings—about the popularity (or otherwise) of content. This includes numbers of views, and likes and dislikes in the form of thumbs-up and thumbs-down on YouTube, user ratings of films on MUBI (see Figure 11, upper right corner), and IMDB ratings incorporated into lists of films and shows to see on Amazon Prime Video, alongside user ratings. User ratings are a version of the tendency toward popularity ratings on social media and on other streaming platforms (notably the audio streaming service Spotify). As Couldry and van Dijck (2015) point out, social media's constructions of reality "work through processes of counting and aggregation that allow a new and hegemonic space of social appearances to be built" (p. 1). They have in mind the way that individuals

become customized to monitor and care about such counting on social media—for example, in terms of numbers of friends, likes, retweets, etc. This “space of social appearances” has also served to transform the older “market information regimes” (Webster, 2014) of television. Previously, ratings and discourse about ratings successes served a similar function that gave priority to certain shows. Metric display power naturalizes and makes more visible hierarchies of winners and losers in ways that affect participation, compensation, visibility, and popularity (van Es, 2019) and influence what content and experiences users are more likely to have.

### **Prospects for Managing Interface Circulation Power**

These circulation powers by no means exhaust the kinds of powers exercised by the various actors involved in the new video environment. Circulation power is just one category of power that can be identified in the operation of media and cultural industries and is negotiated among other power relationships. The technological sophistication of digital technologies enables device manufacturers, video service operators, and video marketplaces to collect and analyze a far more detailed array of data than has characterized video circulation in the past. This *data power* is undoubtedly important in influencing decisions about circulation and of course involves problems of privacy and surveillance, but we have bracketed off analysis of data power to maintain a manageable scope for this article. In contextualizing circulation power, we must also acknowledge that some powerful actors, especially states and corporations, exercise *infrastructural power*, or control over the very means of circulation. Internet service providers are the key organizations with the latent power to determine the speed of Internet downloads, giving them significant potential influence over those whose deployment of circulation power is considered here.

Circulation power mostly derives from the priorities and aims of the entities engaged in video circulation. As we noted earlier, it is not always a matter of conscious intention on the part of institutions. However, it can be limited by efforts to minimize the inevitability of some interface positions being better than others. Given that Internet distribution of video has created new mechanisms by which circulation power can be intentionally deployed, a next step is to consider whether and how cultural and competition policy might establish appropriate boundaries around its use. A key area might be to apply the expectations of transparency of paid prioritization found in other realms to the distribution of video services and programs. Preloading and paid positioning on interfaces also should be identified. Policy makers might create guidelines aimed at ensuring that devices cannot deliberately exclude or deprioritize particular services, or they might set guidelines and establish governing bodies that can adjudicate conditions regarding when exclusion can occur and to ensure that certain kinds of content are easily findable via platform search engines. The European Union’s Audio-Visual Services Directive (European Union, 2018) has already introduced measures of this kind, and UK regulator Ofcom has recommended the introduction of similar services in Britain (Ofcom, 2019). Displays of metrics might be required to be accurate, and audits provided of the information displayed.

Not all video services—Internet-distributed and otherwise—have equivalent access to circulation power. It is important to remain attuned to discrepancies among those in the competitive field before advocating uniform legislation and regulation across a sector. We would particularly highlight the competitive advantages of those companies with multiple integrated businesses—particularly Amazon and Apple—that derive revenue from their streaming devices, from selling programming directly, from selling programming in

bundles, and from selling access to third-party services. These integrated businesses—in which video is by no means their primary source of revenue—derive considerable benefit from their reach, ability to cross-subsidize and accept losses until competitors can be reduced, and share data across their enterprises.

As we have noted, circulation power is by no means new. Viewers had limited ability to counter this power in the context of linear distribution. An important goal is greater knowledge and understanding of the industrial practices that shape the availability, prominence, and discoverability of programming and services. This will only be possible with greater transparency. The goals of the article are to contribute to such knowledge and understanding and to identify particular mechanisms of circulation power that might be applied in various geographical contexts as well as to other media industries in which new forms of circulation and mediation are also apparent, such as music and games.

The video devices we use continue to change rapidly, which has made fixing details of this discussion difficult. Just during the period in which we conceptualized and drafted this article, several new interfaces that “aggregate” services and programs have emerged and seem on pace to become a dominant mode because of the benefits they offer both users and corporations. The Apple TV app, launched in May 2019, and Amazon’s Prime Video home page are key examples, but even smart TV manufacturers such as Samsung have added this blended access to services and programs. The analysis identifying mechanisms of circulation power illustrated in this article can also apply to aggregated interfaces, although, as Cathy Johnson (forthcoming) notes, device manufacturers such as Apple and Amazon are advantaged by their ability to preload their aggregator interfaces; this aggregation will yield far more usage and viewing data than those available when viewers shift between discrete apps for different services.

In addition to being an account of specific practices of the moment, our intervention here is also conceptual. People currently access video content using many different screens and by connecting those screens with many different devices and distribution technologies, but the power relations we highlight are likely to persist despite continued innovation, variation, and adjustment. It may be that in coming years smart TVs will be pervasive and their navigation software robust enough to diminish the need for the streaming devices that have been prevalent to date. That will simply mean that smart TVs become the crucial sites for circulation power. Already emerging technological innovation in the form of voice navigation is also likely to considerably change this environment and to diminish the circulation power that can be deployed through interfaces. Such a development will require new lines of analysis and identification of mechanisms for exerting circulation power in voice command.

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