CONVERGENCE

Video-on-demand catalog and interface analysis: The state of research methods

Ramon Lobato and **Alexa Scarlata**
RMIT University, Australia

Tyson Wils
Independent Scholar

Abstract

The global proliferation of internet-distributed video-on-demand (VOD) services has left in its wake a rich but scattered corpus of research into the catalogs and interfaces of these services. Using empirical methods and sources including scraping, observation, digital simulations, and third-party datasets, researchers have found many ways to study VODs, their content, and their recommendations. Our article provides a critical review of this research landscape. We describe the evolution of two key methods: catalog analysis and interface analysis. We then explain how these methods intersect with each other and also with audience research. Throughout, we assess the value and limitations of various methods, showing how they fit within a wider research landscape that involves multiple 'ways of knowing' VOD. The practicalities and politics of access to VOD data are considered throughout.

Keywords

Video-on-demand, catalog analysis, interface analysis, content diversity, exposure diversity, discoverability, prominence, research methods

Introduction

The global proliferation of internet-distributed video-on-demand services (VODs) has left in its wake a rich but scattered corpus of research into the catalogs and interfaces of these services. Using empirical methods including scraping, observation, digital simulations, and quantitative analysis of third-party datasets, researchers have investigated issues related to the structure, curation, and use of VODs. Within this literature, two critical themes emerge. The first is *diversity* – referring both to the

Corresponding author:
Ramon Lobato, School of Media and Communication, RMIT University, 124 La Trobe St, Melbourne VIC 3000, Australia.
Email: Ramon.lobato@rmit.edu.au

diversity of titles in VOD catalogs (content diversity), and the differentiated audience consumption of VOD content (exposure diversity). The second is *prominence,* including the related concept, *discoverability* – referring, respectively, to the relative visibility of content within the interface and its accessibility through search, promotion, and recommendation.

To investigate these interconnected issues, academics, regulators, and market researchers have developed different research approaches. These include retrofitting research methods initially developed in fields such as broadcasting research; devising techniques for manual and automated data collection from catalogs and interfaces; and developing new concepts and theories needed to interpret these data. Such work contributes to a vibrant international research enterprise dedicated to understanding the online video ecology.

Much of this research explicitly challenges the common assumption that VODs are black boxes impenetrable to academic inquiry. On the contrary, researchers have shown that VODs offer a wide range of semi-public data including titles, genres, metadata, recommendations, artwork, promos, ads, and interfaces. Such data provide useful insights into content diversity and exposure diversity; as such, they provide useful context for current policy debates about audiovisual diversity, recommendation bias, and other related issues. However, such data are often difficult to gather and interpret, and the research literature on these topics is highly fragmented. As a result, researchers may struggle to access current best-practices in VOD research methods, increasing the risk of redundancy and replication.

To address this problem of knowledge, our article provides a critical survey of the current state of VOD research methods, focussing on VOD catalog and interface analysis. We consider the value and limitations of these methods for debates about audiovisual diversity, discoverability, and platform regulation. Our analysis is informed by our own experiences researching VODs, including hands-on experience with several of the methods discussed below, and by our professional observations of empirical research approaches used within government. We reflect here on what we have learnt about the limitations of different approaches, and the benefits of combining them in different ways.

The article proceeds as follows. First, we describe the evolution of catalog analysis and interface analysis as methods for studying VODs, building on earlier published review articles (Lobato, 2018; McKenzie et al., 2023). We then explain how these methods intersect with each other and with audience research. Throughout, we critically assess the value and limitations of each method, showing how it fits into a wider research landscape that involves multiple 'ways of knowing' VOD.

VOD research is already a vast field and we do not attempt to cover everything in this review. We note some important provisos. First, we have focused on what we believe to be the most widely cited English-language studies in VOD interface and catalog research, as well as those that have introduced novel methods of data collection or analysis. In doing this, we are mindful that these inclusion criteria inevitably skew the sample toward research from national markets where the VOD ecology is most developed (i.e. high-income countries), as well as studies published in prominent English-language journals. Of course, other valuable studies exist that are not discussed here – and many more will be published in coming years. Our examples should therefore be considered illustrative rather than exhaustive. Second, we focus specifically on VODs for film and TV content, notably SVODs (subscription VODs) and BVODs (broadcaster VODs). We exclude studies of social video platforms, such as YouTube and TikTok, which have both a different structure and a separate research literature. Third, our article focuses on VOD research from screen, film, media, and media industry studies, where small-n and qualitative studies are preferred, as well as policy research by regulators and other institutions seeking to understand actually-existing VOD market dynamics. However, we have excluded simulation-based, experimental, and behavioural-science approaches (see McKenzie et al., 2023 for an excellent overview).

VODs as research objects

Let us first consider the different elements that make up a VOD and how each can be studied. There are three elements to consider here: the catalog, the user interface (UI, hereafter 'interface'), and the audience. Table 1 shows our analytical framework for VOD research. Each element invites particular research methods which in turn illuminate a specific aspect of VOD diversity.

Catalogs (also referred to as libraries) are the databases of licensed and in-house content offered by each VOD. These provide the raw material from which VOD interfaces curate their content offering. While the structure of the catalog may vary, all catalogs comprise at minimum a collection of titles, metadata, and artwork, which can be accessed by scraping the interface or, in some cases, by third-party indexes. Catalog analysis can be used to understand content diversity – defined as 'heterogeneity of media content in terms of one or more specified characteristics' (Van Cuilenberg, 1999: 188). However, it cannot function as a stand-in for exposure diversity – that is, 'the nature of the content and sources actually consumed by media users' (Napoli, 2011: 246) – because it does not give any insight into the often highly personalised presentation of content or actual consumption by the user. The types of content diversity typically explored through catalog analysis include country-of-origin, genre, and format diversity, as these variables can often be easily identified from title metadata. Other types of content diversity analysis – for example, focussing on identities and social representation – are also possible but are more labour-intensive, requiring content analysis of relevant titles.

Interfaces are the curated environments, including the home screen, that present the VOD to the user. Interface elements include promotional carousels, recommendations, curated or algorithmically-generated recommendation rows, search pages, and ads, each of which can be studied in its own right. Interfaces can be analysed from the perspective of content diversity, for example, by analysing linguistic or geographic diversity of titles shown on the home screen. In some cases, interfaces can also be used as a partial proxy for exposure, although personalisation effects make this increasingly difficult. Interface analysis can also be used to measure prominence (easy visibility) and discoverability (ease of discovery) within the interface.

Audiences are the final piece of the puzzle. Audience engagement with individual VODs and across the VOD landscape is the crucial factor in understanding exposure diversity. Such engagement can be studied through various methods – including interviews, observation, diary studies, or digital simulations – which can be used alongside interface and/or catalog analysis. Whichever method is used, research needs to account for the fact that audiences have different journeys from the time they turn on their devices to when they turn them off, with variations in

Table 1. Analytical framework for video-on-demand research.

	Type of diversity	Critical issues/problems	Research methods
Catalog	Content diversity	Diversity of: country-of-origin, language, genre, format, etc.	Catalog analysis (manual or automated).
Interface	Content and exposure diversity	Curation, access, prominence, discoverability, design, device/platform variation.	Interface analysis, prominence analysis, user testing, UI feature analysis, heatmaps, distant reading.
Audience	Exposure diversity	Consumption, viewing practices, access, skills, literacies.	Surveys, interviews, observation, simulations, diary studies.

switching behaviour between different channels and services – all of which can impact discoverability pathways. This heterogeneity in audience behaviour has implications for how to measure the levels and types of exposure diversity for individuals and across populations.

Each of these three elements ties directly to specific policy debates. Analysis of catalogs is integral to cultural policy and specifically to the policy mechanism of content quotas (e.g. the EU's Audiovisual Media Services Directive 2018 revision requires a minimum of 30% European content quota in SVOD catalogs). Analysis of interfaces is crucial for policy analysis of algorithmic diversity, algorithmic bias, recommendations, nudging, visibility, prominence, promotion, and discoverability. These two supply-side perspectives are complemented by the demand-side perspective of audience research which provides essential insight into the actual consumption practices of populations (exposure diversity). VOD research is therefore multifaceted, and each element provides only one part of a larger picture. No single method captures all these elements. For a holistic perspective it is necessary to combine multiple methods. We now consider each of these methods in turn.

Catalog analysis

The most straightforward method for studying VODs is catalog analysis, a form of content analysis. Catalog analysis drives from an earlier tradition of broadcast schedule analysis (Katz and Wedell, 1977). It is also related to contemporary forms of schedule analysis, which approach the schedule as a site of televisual branding, business models, temporal flow, and audience engagement (Bruun, 2019: 16-17). Building on these traditions, catalog analysis can be used to understand the composition and characteristics of SVOD libraries, and the curatorial logics that inform those libraries.

Through catalog analysis, researchers investigate issues such as catalog size, origins, genre mix, languages, and categorisation logics. Such knowledge is useful for understanding how VODs perform in terms of content diversity, and the degree to which each service is offering local content, national content, regional content, public-interest content, linguistically diverse content, and other content categories. In this way, the method is a helpful lens for assessing 'concerns [about] cultural imperialism, the audiovisual trade balance, and cultural diversity' (Larroa, 2023: 666).

Catalog analysis can assist researchers to understand competitive dynamics in the marketplace. For example, Lotz et al. (2022: 514) used catalog analysis to explore 'what [specific SVOD] services offer, how the offerings of the services differ, and how those offerings compare with linear, ad-supported services'. Iordache et al. (2023: 362) used the same method to 'identify strategies of complacency, resistance, differentiation, diversification, mimicry or collaboration' within VOD markets. At scale, this method can also be used for longitudinal and transnational analyses that compare catalogs in different countries. Aguiar and Waldfogel (2018) analysed global Netflix catalogs sourced from UNOGS (Unofficial Netflix Online Global Search) to develop a novel way of measuring cross-border content availability ('value-weighted geographic reach').

Table 2 shows examples of catalog studies focussing on national content. These are arranged into four categories: single-VOD, single-territory studies; multi-VOD, single-territory studies; multi-territory, single-VOD studies; and multi-territory, multi-VOD studies. These latter studies are complex and often demand resources beyond the reach of individual researchers. For this reason, they tend to be conducted by regulators or consulting firms with specialist expertise in catalog scraping.

The European Audiovisual Observatory (EAO), an EU-funded research centre, pioneered many of the scraping methods now used to analyse VOD catalogs (e.g. Grece, 2018). During the 2010s, when European media policy was grappling with the impact of Netflix and other US-based SVODs

Table 2. Examples of key SVOD catalog analyses focussing on content diversity (national/local content). Italics indicate automated analyses.

	Within a single-VOD	Across multiple VODs
Single territory	Bonini and Bertolucci (2019): National content in Netflix Italy	ANCINE (2017): National content in Brazilian VODs
		Lobato and Scarlata (2019); Scarlata and Lobato (2023): National content in Australian SVODs and BVODs
	Mastrini and Krakowiak (2021): Netflix originals in Netflix Argentina	Aranzubia and Gallego (2021): National cinema in Spanish VODs
		Smits (2022): National cinema in German VODs
	Albornoz and García Leiva (2022): Netflix originals in Netflix Spain	Albornoz et al. (2023): National content in Spanish VODs
		Iordache et al. (2023): Programming strategies, Flemish content in Belgian VODs
Multi-territory	Aguiar and Waldfogel (2018): National content in Netflix global catalogs	European Audiovisual Observatory [e.g. Fontaine and Grece (2016); Grece (2018); Grece and Jiménez Pumares (2017)]: national content in EU VODs
	Catalan Audiovisual Council (2020): European and Catalan works in Netflix Spain	
	Frey (2021a): MUBI catalogs in Belgium, UK and US	Szczepanik (2020): Czech films in EU VODs
	Iordache (2022): Investment strategies in Netflix Belgium, Romania, Spain and Sweden	
	Lotz et al. (2022): National content in 17 Netflix territories	Larroa (2023): National content in five VODs in Mexico and Canada

on audiovisual diversity in Europe, the Observatory's catalog studies uniquely clarified the direction of transnational content flows in SVODs. These methods were then adapted by other scholars within Europe and worldwide. The research of the EAO also informed the work that went into developing the revised Audiovisual Media Services Directive, which increases obligations to promote European works for non-linear services.

Private providers specialising in catalog research have also emerged, notably the UK-based commercial data analytics firm Ampere Analysis, which worked with the Observatory and became its main data provider. Ampere's proprietary SVOD database, which can be licensed for scholarly use, allows researchers to track SVOD licensing with attention to variables including national origin, language, and producer. Using Ampere data, Lotz et al. (2022) were able to explore and compare seventeen national Netflix libraries. Ampere has also been used by regulators; for example, Ofcom commissioned Ampere to analyse the volume of content, types of content, and the lifecycle of titles in UK VODs (Ampere Analysis, 2019). These commercial research platforms are priced expensively for corporate clients and are designed for commercial applications such as demand modelling, catalog benchmarking, and marketing analysis – which, along with their high cost, may explain why these tools are rarely used in academic research.

As an alternative, it is possible to study VOD catalogs using free third-party indexes such as JustWatch. While useful, these indexes may contain errors or display restrictions. Another limitation is that coding can be complex due to inconsistent classification; for example, 'definitions of [country

of] origin vary from country to country and defining local culture has always been problematic and a topic of debate' (Larroa, 2023: 672). Within jurisdictions themselves there may be multiple ways to define what is local and researchers and agencies may not always adopt the same definitions as VOD providers. Assigning countries of origin to catalog titles in a way that conforms to legislative definitions of national content is therefore a complex task.[1] Additionally, how researchers and VODs tag content may be inconsistent, and catalog analysis may be impacted by the researcher's ability to visually recognise national or other types of content.

Another approach is to gather data manually through the VOD interface (manual catalog analysis). This is a low-cost, accessible method which does not require specialist resources and or expensive infrastructure. All that is required for a manual analysis is access to a VOD, a search and classification taxonomy, a spreadsheet to record findings, and time. Because the work of manual catalog analysis involves many hours of browsing and searching within a VOD interface, it requires the researcher to get 'up close and personal' with the catalog. This intimacy can lead to surprising insights; for example, identifying unusual clusters of titles in specific genre niches, particular patterns of licensing that reveal previously unknown commercial strategies, or discoverability quirks related to visibility, indexing, and retrieval of titles in search (Lobato and Scarlata, 2019).

A methodological divide thus characterises the catalog studies literature. On one side: automated methods designed for speed, scale, and transnational and multi-service comparison, which are used by quantitatively-inclined scholars as well as policymakers requiring hard evidence to inform government decision-making; on the other: manual methods, which are labour-intensive, inductive, contextual, and favoured by scholars in the humanities.

Over time the scope of catalog research has expanded to include other issues beyond national content. Recent catalog studies consider topics such as the proportion of auteur/festival cinema in catalogs (Farchy et al., 2019), age and exclusivity of content (Lobato and Scarlata, 2019), SVOD investment strategy (Iordache, 2022), the categorisation of queer media (Monaghan, 2023), IP sources of Netflix originals (Cuelenaere, 2024), and pricing of content (Suzor et al., 2017). These examples show the range of different issues and topics that can be usefully studied using a catalog analysis method, combined in some cases with targeted textual or content analysis. We expect, and hope, that these methodologies – like national content analysis – will grow over time to permit a much wider range of research possibilities that can be addressed through the catalog, allowing a multifaceted understanding of the politics of access and representation in VOD.

National regulators have also built their own publicly available tools to track catalogs. For example, Australia's Bureau of Communication, Arts, and Regional Research (BCARR) built an online dashboard related to SVOD consumers, content, and production in 2021-2022, to monitor local content levels over time (BCARR, 2022). BCARR used Ampere data to show the number of titles and share of Australian content within eight SVODs (both Australian and foreign owned) between 2015 and 2021. The adoption of catalog research methods by governments represents the migration of this empirical technique into the sphere of public policy and public knowledge infrastructure.

In summary, various forms of catalog analysis now exist including manual, automated, single-SVOD, multi-SVOD, single-territory, and multi-territory approaches. While much work has focused on content diversity and national content, the scope of research has expanded to consider other issues including genres/formats, pricing, representational diversity, and IP sources. The limitations of catalog analysis have also become apparent, including its time-intensive and resource-intensive nature, a tendency towards simple counting at the expense of more integrated and contextualised analyses, and its inability to deal with discoverability and exposure. As Farchy et al. (2022: 423) observe, 'the mere presence of a title in a catalog does not necessarily imply that the user

can discover it [and] the abundance of online content does not automatically create diversity in access to content'. For these reasons, attention is increasingly turning to a different empirical method for studying VOD: interface analysis.

Interface analysis

To explore discoverability, prominence, and personalisation in VOD services, a different set of methods are needed. As Bideau (2022) observes, the VOD *interface* is the logical site for such research:

> Streaming services today give access to such a large selection of contents that [catalog analysis] methods are no longer relevant. Indeed, what is the use of measuring diversity in a catalogue that no one user ever sees in its entirety? Surely the more relevant space within which to study cultural diversity is the user's screen and the subset of works from the catalogue that appear on it.

While Bideau's argument about catalog analysis may be debatable, his point about the analytical importance of the interface is undeniable. Yet, as Johnson (2017: 124) observes, there are still few 'established methodologies in TV studies for studying interfaces', and data collection remains difficult given the impossibility of observing users' screens at scale. How, then, are researchers studying VOD interfaces?

Several methods have emerged in recent years. The first of these involves **critical readings** of VOD interfaces as screen media texts. Foundational studies in this tradition by Chamberlain (2011), Johnson (2017, 2019) and Hesmondhalgh and Lotz (2020) explore the dynamics of power and control within VOD interfaces. Chamberlain (2011) described interfaces as 'scripted spaces', designed to encourage movement in certain ways to achieve commercial objectives. Johnson (2019: 113) explored how interfaces 'create an illusion of abundance and plenty' and 'minimise inter-activity while creating an illusion of user agency'. Case studies include work on Hulu (Sanson and Steirer, 2019), Netflix (Lobato, 2019; Van Esler, 2021), Shudder (Balanzategui and Lynch, 2023), BBC iPlayer (Grainge and Johnson, 2018), and ITV Hub (Johnson, 2017). These studies connect the design and aesthetics of the interface with questions of political economy, branding, and control. A comparative version of this approach involves structured analysis of multiple VOD interfaces to identify similarities and differences across various services; for example, Iordache and Raats (2023) combined interface analysis with catalog analysis to study five PSB VODs in Western and Northern Europe. Other interface studies have compared iPlayer with DRTV (Kelly and Sørensen, 2021) and TV2Play with DRTV (Bruun and Bille, 2022).

A second approach is quantitative or qualitative research into **interface curation.** This involves tracking how interfaces are populated with different kinds of content, including both content and ads/promos, and how these factors change over time. Methods used to undertake this analysis commonly include assembling databases to track the appearance of tiles or creating heatmaps of the interface. For example, Frey (2021a) and Smits and Nikdel (2019) analysed the curation of the arthouse cinema streamer Mubi. Curation studies of BVODs foreground the specific logics and challenges faced by PSBs as opposed to commercial subscription services, often considering how the broadcast schedule is translated to the VOD interface (Bruun, 2019, 2023; Bruun and Bille, 2022; Bruun and Lassen, 2023; Lassen and Sørensen, 2023). Kelly's curation study of BBC iPlayer is notable for its longitudinal approach, which pioneered a 'distant reading' method to identify longer-term trends in content visibility (Kelly and Sørensen, 2021). Using heatmaps to visualise changes in the iPlayer interface over two years, Kelly found that non-factual genres were more

heavily promoted than factual genres (such as arts, news, documentary, and history), and that the visibility of linear channels declined over time while the visibility of box-sets grew. As Kelly notes, longitudinal interface studies require long-term monitoring rather than 'ad hoc observations and/or close analysis' (2021: 265-66). Another suggestive quantitative study considers the interface of DRTV, the Danish public broadcaster (Lassen and Sørensen, 2023b). By scraping the DRTV interface, the authors created a dataset of hundreds of thousands of promos and recommendations (tiles) on the DRTV home screen, allowing them to quantify change within different areas of the interface over a period of seventeen months. They found that DRTV 'curation primarily focuses on the top of the page, and that the large volume on the lower parts of the page remain untouched for long periods of time' (ibid: 105-106). Approaching the audience from a different angle, Thurman et al. (2023) combined attention to the BBC Three interface structure with ratings analysis.

A third approach is to study specific **interface features**, as opposed to the whole interface. For example, scholars of Netflix have analysed its Top 10 rankings (Scarlata, 2023), its algorithmically personalised cover art (Eklund, 2022) and its recommender system (Gaw, 2022; Khoo, 2023; Pajkovic, 2022). A related tradition is the aforementioned scheduling studies approach, which can be productively extended to understand VOD interface features. Scholars of public-service and Nordic television have used this approach in suggestive ways to analyse VOD interfaces and their roots in the linear schedule (Bruun, 2019; Bruun and Bille, 2022; Bruun, 2023; Bruun and Lassen, 2023). For example, Lassen (2023) analysed the use of badges and live TV tiles to prioritise time-sensitive content. This style of interface analysis, here combined with production studies methods, reveals important differences between BVODs and SVODs.

A fourth approach is to analyse **promotional slots** within VOD interfaces, with the aim of understanding what content is being promoted to the user. This may include the analysis of display ads, promotional rows/rails, recommendations, or all the above. For example, the European Audiovisual Observatory analysed thousands of promotional slots on the home screens of the TVOD stores Google Play, Amazon, and SFR Canal VOD (Fontaine, 2021) over the course of a month. This study found that only about 1% of titles in the catalog are promoted each month and that 10 film titles 'captured about 37% of all promotion efforts' (ibid: 7). Findings such as these are important because they show that diverse catalogs may become highly concentrated at the point of promotion. Another example is a study by Scarlata and Lobato (2023) on the Australian BVOD services 7Plus, 9Now, and 10Play. To determine the proportion of promotion devoted to Australian content on those BVODs, the authors monitored promotional slots over two months in conjunction with a catalog analysis. They found that while BVODs tended to offer fewer local titles in their catalogs than on their linear TV channels, BVOD home screens featured a disproportionately high promotion of local content, which occupied around half of all promotional slots. In other words, the BVODs were weakly 'Australian' from the perspective of catalog but strongly 'Australian' from the perspective of promotion. As these examples show, questions of diversity and localism quickly become complicated when we factor in interfaces. This raises an epistemological question: what is the appropriate site of research, the catalog or the interface, and how might their analysis be integrated?

Experimental methods for studying personalised recommendations: simulations and bots

With the rise of prominence and discoverability as policy concerns, the need for robust data on VOD recommendations is widely acknowledged. But recommendations are the hardest element of a VOD to study, because of their dynamic and personalised nature. As Kelly (2021: 269) notes, personalisation 'presents the biggest methodological challenge for media studies scholars'.

How then to study recommendations? The existing literature suggests some possibilities. Bideau and Tallec (2022) studied Netflix recommendations by simulating and testing the effects of different viewing behaviour. Using Raspberry Pis (tiny single-board computers), they trained bots to watch Netflix for three hours each evening for eight days. Each bot was assigned unique and contrasting taste profiles; for example, a fan of Japanese content versus a fan of European content. Bideau and Tallec then studied Netflix's recommendations for each 'user', noting every title that was promoted on the home screen during the test period. They found that watching only European content on Netflix tends to result in an increase in recommendations for European content on the home screen, and vice versa. Concerns about 'invisibility by way of the algorithm', though, seems to be unfounded: 92% of European titles in the catalog were recommended at least once to one or more bots. Bideau and Tallec concluded that 'overall, there does not seem to be many "dormant" titles buried deep within the catalog'.

Researchers without these computational resources may also consider licensing data from specialist research firms, including MTM, Looper Analysis, Arvester and AQOA, which have all developed automated methods to capture VOD recommendations. Like the catalog analysis tools developed by Ampere Analysis, these services may be expensive and/or come with restrictions on the use of data. For this reason, they tend to be used primarily by corporate and government clients (e.g. Fontaine, 2021).

Fortunately, reverse-engineering of recommendation algorithms can also be achieved manually through 'speculative experimentation and playing around' (Bucher, 2018: 60). An example is Pajkovic's (2021) study of Netflix recommendations, which used fake user profiles to mimic different personas including a 'die-hard sports fan', a 'culture snob', and a 'hopeless romantic'. Pajkovic found that the recommendations for each profile became increasingly genre-specific. In contrast, a fourth 'genre disruptor' persona led to a 'highly diverse homepage absent of an easily distinguishable taste identity' (ibid: 224). Using a similar approach, Česálková (2023) examined curation and discoverability of classic movies on Netflix (Czech Republic) via three experimental user profiles that searched, selected, and watched with varying degrees of intensity. She then tracked the evolution of each profile's menu and its saturation of classic movies over time, observing a clear correlation.

These approaches to capturing VOD recommendations suggest interesting possibilities for research. Of course, there are also limitations to consider. The cost and complexity of capturing or simulating recommendations in SVOD services means that it is very difficult to extrapolate findings to a population level. Another consideration is that recommendations, even though they provide another vital piece of the exposure puzzle, do not actually tell us about audience consumption. Hence there is still the need to consider some form of audience research as part of an integrated approach to studying VODs.

Intersections with audience research: joining the dots between supply and exposure diversity

While supply-side research methods are useful for studying content diversity, they cannot fully address the question of exposure diversity. To understand exposure diversity in VOD researchers need to find some way of asking actual people about how they use VODs – or observing such use.

In a recent contribution to the methodological debate, Frey (2024: 133) argues for a more nuanced stage of research into VOD recommendation and its effects on exposure diversity, advocating for a return to audience research. Observing that 'the technological basis of recommender systems is a poor predictor of consumption outcomes', Frey argues that researchers need to

investigate '[what] audiences actually watch' as well as what is promoted to them on the home screen. Shifting the focus to audiences in this way also requires that we question deterministic effects-models and focus instead on audience practices:

> Discussions of film and media diversity, perhaps in a hangover from the days of limited media options and the three-to-four-channel linear television landscape, often imply a passive consumer whose horizons will be either broadened or narrowed by a respectively benevolent or malevolent programmer – with this metaphor now being extended and essentialized to the benevolent curator and the malevolent algorithm. […] As we speak about VOD users we must be careful to assume neither a rational-agent, perfectly informed 'active' user nor an absolutely 'passive' corporate-technology victim (ibid).

This attention to audience engagement with recommendations can be seen in Frey's book *Netflix Recommends* (2021b), which includes a fascinating empirical chapter on audience discovery entitled 'How real people choose films and series'. Frey conducted two nationally representative surveys in the US and UK, followed by 34 qualitative interviews in the UK. These found 'no compelling evidence to show that algorithmic recommender systems are the most important or most widely used form of suggestion' (ibid: 132-133). Instead, they revealed a diverse variety of online and offline factors – including recommendations from friends, the opinions of others watching, the popularity of titles on the platform, and genre searches – that shape content selection.

Another study using a combination of survey and interview methods to explore VOD discovery is the 'Routes to Content' project (Johnson et al., 2020a; 2020b; 2022; 2023). Based on a multi-year study of streaming behaviours in the UK involving a national survey and follow-up interviews, Routes to Content explores 'how people find and make decisions about the television content that they choose to watch' (2020a: 1). Challenging assumptions about the deterministic power of algorithm recommendations, Johnson et al. found that UK audiences have an average of eight different ways to discover content, including word-of-mouth, traditional advertising, and social media. In other words, while the VOD interface plays a role in discovery it is only one of many factors. This finding was echoed by a separate study on VOD discovery in Australia based on a national survey (Lotz and McCutcheon, 2023). Lotz and McCutcheon found that around half of the time Australian viewers already knew what they wanted to watch before opening a VOD, leading the authors to suggest that 'concerns about algorithmic priority and display [in the interface] may be overstated' (ibid: 7). Martínez and Kaun similarly found that discovery was strongly shaped by 'practices outside the platform: sharing trailers, commenting with friends, and promoting certain shows' (ibid: 209-210), while audience research by Lüders and Sundet (2022) again demonstrated that the 'experiential affordances of watching online TV are relationally contingent on technical materiality, viewer agency, and social context' (ibid: 347). This growing corpus of qualitative audience research is challenging the often deterministic discourse about algorithmic effects in VOD usage in at least two ways. It foregrounds the importance of offline and social communication, reminding us that interfaces and algorithms are not all-powerful, and it draws attention to the agency and diversity of individual users as they negotiate interfaces.

Audience scholars have also used creative ethnographic methods to capture the nuances of VOD use. Varela Martínez and Kaun (2019: 201-202) combined a walkthrough of the Netflix interface with 'think aloud' interviews with heavy Netflix users in Singapore to investigate usage and perceptions of the recommendation algorithm. As the users moved around the interface, the authors asked them to 'reflect on what they were doing and why' (ibid). During their thirteen interviews with Malaysian and Indonesian audiences, which sought to understand patterns of 'roaming' across the media landscape, Hill and Lee (2022: 99) asked participants to physically 'draw maps that imagine

the psycho-social terrain of their media landscape'. These visualisations uncovered the trope of the 'Netflix Park': a gated community of subscribers that is at once open and sociable, but also aggressive and territorial. By foregrounding the full range of cultural and social variables in VOD use, these studies helpfully shift debates about interfaces away from a deterministic effects paradigm toward a more contextual and integrated analysis.

Audience research is also an important tool for regulators and governments, which use a range of methods (including annual surveys and market research) to understand how populations use VODs. While the aim of this research is typically to identify emerging harms or assess impacts and vulnerabilities among populations, these studies often contain fascinating insights into exposure diversity. Audience research on content discovery conducted by Canadian government agencies in 2016 – which found that word-of-mouth was the most important discovery mechanism – informed that country's policy approach to digital discoverability in VODs (Canada Media Fund, 2016a; 2016b). Other government research has used surveys to understand decision-making and discovery by TV audiences, as part of regulatory investigations into VOD (Ofcom, 2023; Social Research Centre, 2022). Here participants reflect on challenges of discovery and navigation in VODs and what methods they use to make choices. While much of this research explores behaviours, attitudinal survey research has also been conducted by some regulators to assess community expectations for VOD regulation (Ofcom, 2023).

These studies show the importance of integrating audience research with interface and catalog research. Using surveys, interviews, and other methods, audience researchers have added important nuance to claims about the deterministic power of algorithms to shape viewer behaviour. Indeed, most of these studies have confirmed the importance of offline discovery practices (word-of-mouth and social recommendation) over algorithmic recommendations. Rather than confirming the audience as free agents or cultural dupes, audience research tends to reveal a wide array of different usage and discovery behaviours whose analysis can advance theory-building about exposure diversity. However, such research should not fall into the trap of simply describing or celebrating audience agency, as has occurred in previous waves of audience studies. Instead, the focus needs to be on explaining the dynamics of audience agency and choice *in relation to* the structuring power of the VOD catalog, the interface, and recommendations. Indeed, in both academic and government literature, consideration has been given to broader institutional and industrial factors at play in diversity, discoverability, and prominence (Albornoz and García Leiva, 2019; Canada Media Fund, 2016b).

Discussion: Futures of VOD research

In this article we have surveyed the key empirical methods that can be used for researching VODs. Across catalog research, interface analysis, and audience research, scholars have deployed various techniques including scraping, manual content analysis, simulations, surveys, interviews, and distant reading. There now exists considerable depth and expertise in each of these methods, indicating a maturing research enterprise.

It is important for scholars working in the field to build on this existing knowledge rather than reinvent the wheel. With so many useful models for catalog analysis, interface analysis, and audience research to draw on, researchers have access to many interesting exemplars. We hope our review will save time and effort by pointing researchers in some interesting directions. We believe the methods discussed here offer an appealing and robust alternative to more ad hoc, impressionistic studies of VODs.

Empirical research on VODs has been siloed to date, with many different specialisations that do not always talk to one another. As a result, certain aspects of catalog-interface-audience interaction remain under-researched. For example, catalog research studies have rarely sought to integrate audience research. Similarly, audience research has been mostly silent on the question of catalogs – though it has had more to say about interfaces. A few brave scholars have attempted to bridge these gaps through multi-method work that considers catalogs and/or interfaces and/or audiences in an integrated way within single publications (e.g. Frey, 2021b on audiences and interfaces; Broocks and Studnicka, 2021 on catalogs and audiences), or across different projects by a research team (e.g. Johnson, 2019; Johnson et al., 2020a on audiences and interfaces), or in conjunction with ratings analysis (Thurman et al., 2023). Nonetheless, it remains the case that most research has tended to look at a single element of VOD in isolation.

This fragmentation is understandable given the need to develop depth and expertise in specific areas of VOD research, not to mention the well-known risks faced by interdisciplinary or mixed-method research. However, there remains a need for larger-scale, mixed-method research that can look at VODs in an integrated way. The analytical pay-off here would be to explain how different elements of a VOD (catalog, interface, and audience) interact to produce different kinds of diversity or homogeneity effects, across both content and exposure. Such an analysis might also explore whether the diversity dynamics of VOD differ from other areas of the cultural industries where content and exposure diversity have been more extensively excavated, such as news and television (Napoli, 2009). How to integrate these research efforts is perhaps a long-term challenge for the field – something to consider as we consolidate expertise within each field of VOD research.

As the technology landscape evolves and new topics come into focus, the priorities for VOD research will shift accordingly. Already, we can see certain topics barely covered in the literature that are now becoming more important. One example is the recommendation and promotion functions of streaming *devices* – for example, when a smart TV ingests VOD recommendations onto its home screen, which then becomes a primary user interface. Such device interfaces are often difficult to study using existing methods, as they require a different data collection protocol.

Another challenge – always present in audience research – is how to scale up studies of exposure diversity to include more than a small sample of participants. Here, the possibility of data donation is promising. Data donation, used already in social media and advertising research (Angus et al., 2024), allows citizens to donate their viewing histories to researchers for further analysis; these histories are requestable through General Data Protection Regulation in the form of a downloadable spreadsheet. A current project by Karin van Es and Dennis Nguyen of Utrecht University (in progress) is testing the viability of this method to study Netflix usage.

Another potential source for research on interfaces and catalogs is the data VODs provide to government as part of regulatory undertakings or official inquiries. For instance, major SVODs must voluntarily report to Australia's national media and communications regulator (the Australian Communications and Media Authority) on the number of titles and hours of available Australian content and on how they make Australian content discoverable. SVODs also provide information on catalogs and interfaces in their submissions to public enquiries. These sources of information, while often brief or inconclusive, may offer valuable insights into catalog and interface curation.

Finally, there is the opportunity to partner with industry on VOD projects. Many of the questions for which academics commonly seek answers (How do people use VODs? Which recommendations do they see?) are already familiar to those on the inside of VODs, such as product managers and interactive designers, who often have more data at their fingertips than they have time to analyse. Partnering with industry can be beneficial for both sides, but it may require an academic researcher to prove the value of their research for the business challenges of their VOD partner, and there may

be limitations embedded in how the researcher can share findings. Such partnerships may well be the *only* way that academics can feasibly access VOD data, especially certain forms of interface and usage data.

The practical challenges for access to data under all of these scenarios remain substantial. Nonetheless, we hope that these possibilities present opportunities for scholars, regulators and other research professionals to move beyond the black-box stage of research and explore the many different 'ways of knowing' VOD that are now possible.

Declaration of conflicting interests

Funding

ORCID iD

Ramon Lobato https://orcid.org/0000-0002-1689-7233

Notes

1. For instance, 'Australian content' may be variously defined as programs that meet the definition provided in: the Broadcasting Services (Australian Content and Children's Television) Standards 2020 (ACCTS); the Significant Australian Content test used by Screen Australia; or the internal criteria set by a VOD service.

References

Aguiar L and Waldfogel J (2018) Netflix: global hegemon or facilitator of frictionless digital trade? *Journal of Cultural Economics* 42: 419–445.

Albornoz L and García Leiva MT (eds) (2019) *Audiovisual Industries and Diversity: Economies and Policies in the Digital Era*. New York, NY: Routledge.

Albornoz L, García Leiva MT, and Gallo P (2023) *Availability and Prominence of Spanish Audiovisual Works in Subscription Video-On-Demand Services - 2023* Edition. Madrid: Audiovisual Diversity Research Group, Carlos III University. Available at: https://e-archivo.uc3m.es/bitstream/handle/10016/38731/availability_albornoz_2023.pdf?sequence=2&isAllowed=y

Albornoz L and García Leiva MT (2022) Netflix originals in Spain: challenging diversity. *European Journal of communication* 37(1): 63–81.

Ampere Analysis (2019) *The UK VOD Market: Current Status and Future Developments*. London: Ofcom. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0026/149075/ampere-analysis-current-status-future-development.pdf

ANCINE (Brazilian Cinema Agency) (2017) *Public consultation report on the regulatory notice on audiovisual communication on demand and ANCINE's recommendations for a regulation of audiovisual communication on demand*. Brasilia: Ministry of Culture. Available at: https://www.gov.br/casacivil/pt-br/assuntos/downloads/CSC/2016-2018-2a-ro_16-05-2017_resultado-consulta-publica-e-recomendacoes-da-ancine.pdf/@@download/file

Angus D, Abdul Karim O, Jean B, et al, (2024) The Australian Ad Observatory technical and data report. In: ADM+S Working Paper Series. Melbourne: ADM+S Centre. Available at: https://apo.org.au/node/326310

Aranzubia A and Gallego JI (2021) Spanish cinema in the Netflix catalog: a diversity perspective. *Comunicación Y Sociedad* E8030: 1–20, Available at: https://comunicacionysociedad.cucsh.udg.mx/index.php/comsoc/article/view/e8030/6334

Balanzategui J and Lynch A (2023) "Shudder" and the aesthetics and platform logics of genre-specific SVOD services. *Television & New Media* 24(2): 156–172.

BCARR (2022) *Subscription Video on Demand (SVOD) in Australia Dashboard*. Canberra: Bureau of Communications and Regional Research. Available at: https://app.powerbi.com/view?r=eyJrIjoiYmE0ZGUxNjItZmIyNS00YzA0LWE4MTgtNGQ0MjI4NjE4ZDBjIiwidCI6ImFhMjFiNjQwLWJhYzItNDU2ZC04NTA1LWYyY2MwN2Y1MTc4NCNJ9

Bideau G (2022) *A method for measuring content prominence on Netflix. Blog post*. Paris: Chaire PcEn. Available at: https://pcen.fr/activites/a-method-for-measuring-content-prominence-on-netflix

Bideau G and Tallec S (2022) *Algorithmic panic: European contents on the Netflix homepage. Blog post*. Paris: Chaire PcEn. Available at: https://pcen.fr/activites/algorithmic-panic-european-contents-on-the-netflix-homepage

Bonini T and Bertolucci V (2019) The Italian catalogue of Netflix: Highly global (i.e.: American), lowly local. In: *Paper Presented at Platforms and Diversity: Netflix under Debate, 7-8 November*. Madrid: Carlos III University. Available at: https://diversidadaudiovisual.org/wp-content/uploads/2019/11/Bonini_PPT_2019.pdf

Broocks Z and Studnicka Z (2021) Gravity and trade in video on demand services. In: *JRC Digital Economy Working Paper*. Brussels: European Commission.

Bruun H (2019) *Re-scheduling Television in the Digital Era*. London: Routledge.

Bruun H (2023) The changing role of a video-on-demand service in the strategies of public service media: a production study of Danish TV 2 Play and its impact on the production culture of the schedulers, 2016–2022. *Nordicom Review* 44(2): 235–252.

Bruun H and Bille BK (2022) Television documentaries as spearheads in public service television: comparing scheduling practices on the linear channels and video-on-demand services of Danish TV 2 and DR. *Nordicom Review* 43(1): 79–93.

Bruun H and Lassen JM (2023) New scheduling strategies and production culture in public service television in the digital era: the case of DR and TV 2 in Denmark. *Critical Studies in Television* 19: 56–173. DOI: 10.1177/17496020231196422.

Bucher T (2018) *If... Then: Algorithmic Power and Politics*. London: Oxford University Press.

Canada Media Fund (2016a) Discoverability: toward a common frame of reference - Part 1. Available at: https://cmf-fmc.ca/now-next/research-reports/discoverability-toward-a-common-frame-of-reference/

Canada Media Fund (2016b) *Discoverability: Toward a Common Frame of Reference - Part 2: The Audience Journey*. Montreal: CMF. Available at: https://telefilm.ca/wp-content/uploads/2022/01/discoverability-audience-journey.pdf

Catalan Audiovisual Council (CAC) (2020) *Presence and Prominence of European Works on Netflix*. Barcelona: CAC. Available at: https://www.cac.cat/sites/default/files/Netflix_EN.pdf

Česálková L (2023) Film heritage on demand? Curation and discoverability of "classic movies" on Netflix. *Television & New Media* 15: 1–19.

Chamberlain D (2011) Scripted spaces: television interfaces and the non-places of asynchronous entertainment. In: J Bennett and N Strange (eds) *Television as Digital Media*. Durham: Duke University Press, 230–254.

Cuelenaere E (2024) How "original" are Netflix Original films? Mapping and understanding the recycling of content in the age of streaming cinema. *Media, Culture & Society* 1–19. doi: 10.1177/ 01634437231224081

Eklund O (2022) Custom thumbnails: the changing face of personalisation strategies on Netflix. *Convergence* 28(3): 737–760.

Farchy J, Bideau G, and Tallec S (2019) *En compétition: Une décennie de festivals internationaux de cinéma.* Paris: Press des mines.

Farchy J, Bideau G, and Tallec S (2022) Content quotas and prominence on VOD services: new challenges for European audiovisual regulators. *International Journal of Cultural Policy* 28(4): 419–430.

Fontaine G (2021) *The Visibility of Audiovisual Works on TVOD – 2021 Edition.* Strasbourg: European Audiovisual Observatory. Available at: https://rm.coe.int/visibility-of-av-works-on-tvod-2021-edition/ 1680a59bc2

Fontaine G and Grece C (2016) Origin of films and TV content in VOD catalogues in the EU & Visibility of films on VOD services. European Audiovisual Observatory. Available at: https://rm.coe.int/1680783582

Frey M (2021a) *MUBI and the Curation Model of Video on Demand.* London: Palgrave.

Frey M (2021b) Netflix Recommends: algorithms, film choice. In: *The History of Taste.* Oakland: University of California Press.

Frey M (2024) Recommendation logics and exposure diversity. In: C Meir and R Smits (eds)In: *European Cinema in the Streaming Era: Policy, Platforms and Production.* Basingstoke: Palgrave, 131–149.

Gaw F (2022) Algorithmic logics and the construction of cultural taste of the Netflix Recommender System. *Media, Culture & Society* 44(4): 706–725. DOI: 10.1177/01634437211053767.

Grainge P and Johnson C (2018) From catch-up TV to online TV: digital broadcasting and the case of BBC iPlayer. *Screen* 59(1): 21–40.

Grece C (2018) *Films in VOD Catalogues – Origin, Circulation and Age – Edition 2018.* Strasbourg: European Audiovisual Observatory. Available at: https://rm.coe.int/films-in-vod-catalogues-origin-circulation-and-age-edition-2018/168094627a

Grece C and Jiménez Pumares M (2017) *The Origin of Films in VOD Catalogues - Edition 2017.* Strasbourg: European Audiovisual Observatory. Available at: https://rm.coe.int/the-origin-of-films-in-vod-catalogues/168078f2b4

Hesmondhalgh D and Lotz AD (2020) Video screen interfaces as new sites of media circulation power. *International Journal of Communication* 14: 386–409.

Hill A and Lee JC (2022) Roamers: audiences on the move across entertainment platforms in southeast asia. *Javnost – The Public* 29(1): 98–114.

Iordache C (2022) Netflix in Europe: four markets, four platforms? A comparative analysis of audio-visual offerings and investment strategies in four EU states. *Television & New Media* 23(7): 721–742.

Iordache C and Raats T (2023) The platformization of public service media. A comparative analysis of five BVOD services in Western and Northern Europe. *International Journal of Media and Cultural Politics* 19(1): 3–22.

Iordache C, Raats T, Pakvis M, et al. (2023) Piecing the puzzle of VoD offerings: a comparison of eight US and local services in Flanders. *Journal of Digital Media & Policy* 14(3): 357–376.

Johnson C (2017) Beyond catch-up: VoD interfaces, ITV Hub and the repositioning of television online. *Critical Studies in Television* 12(2): 121–138.

Johnson C (2019) *Online TV.* London: Routledge.

Johnson C, Dempsey L, and Hills M (2020a) *Routes to Content: How People Decide what TV to Watch. Report.* Huddersfield, UK: University of Huddersfield Centre for Participatory Cultures. Available at: https://research.hud.ac.uk/media/assets/document/schools/artdesignandarchitecture/research/RoutestoContentReportFinal28Jan20.pdf

Johnson C, Dempsey L, and Hills M (2020b) *Covid-TV: Routes to Content during Covid-19. Report*. Huddersfield, UK: University of Huddersfield Centre for Participatory Cultures. https://research.hud.ac.uk/media/assets/document/schools/artdesignandarchitecture/research/CovidTVReport.pdf

Johnson C, Sandvoss C, and Grant A (2022) *The Impact of Video-On-Demand on Tv Viewing in the UK: Routes to Content after COVID-19 (Interim Report)*. Huddersfield, UK: University of Huddersfield Centre for Participatory Cultures. https://screen-network.org.uk/wp-content/uploads/2022/06/Routes-to-content-june-22.pdf

Johnson C, Hills M, and Dempsey L (2023) An audience studies' contribution to the discoverability and prominence debate: seeking UK TV audiences' 'routes to content. *Convergence*. doi: 10.1177/13548565231222605

Katz E and Wedell G (1977) *Broadcasting in the Third World*. Cambridge, MA: Harvard University Press.

Kelly JP (2021) Recommended for you: a distant reading of BBC iPlayer. *Critical Studies in Television* 16(3): 264–285.

Kelly JP and Sørensen JK (2021) What's on the interface tonight? a longitudinal analysis of the publishing strategies of public service video-on-demand platforms in the UK and Denmark. *MedieKultur: Journal of Media and Communication Research* 37(70): 66–90.

Khoo O (2023) Picturing diversity: Netflix's inclusion strategy and the Netflix recommender algorithm (NRA). *Television & New Media* 24(3): 281–297.

Larroa AM (2023) Supply diversity in subscription video-on-demand platforms in Mexico and Canada. *Canadian Journal of Communication* 48(4): 663–688.

Lassen JM (2023) The reappropriation of time in television: how traditional qualities of broadcast media are being adopted by their video-on-demand services. *Nordicom Review* 44(2): 217–234.

Lassen JM and Sørensen JK (2023a) Curation of a personalised video on demand service: a longitudinal study of the Danish public service broadcaster DR. *Iluminace* 33(1): 5–33.

Lassen JM and Sørensen JK (2023b) Values in and values of video-on-demand services: the case of Danish DRTV. In: M Puppis and C Ali (eds) *Public Service Media's Contribution to Society: RIPE@2021*. Nordicom: University of Gothenburg, 89–110.

Lobato R (2018) Rethinking international TV flows research in the age of Netflix. *Television & New Media* 19(3): 241–256.

Lobato R (2019) *Netflix Nations: The Geography of Digital Distribution*. New York: NYU Press.

Lobato R and Scarlata A (2019) *Australian Content in SVOD Catalogs: Availability and Discoverability - 2019 Edition. Report*. Melbourne: RMIT University. Available at: https://apo.org.au/sites/default/files/resource-files/2019-10/apo-nid264821.pdf

Lotz AD and McCutcheon M (2023) *Australian Screen Stores Viewing Report: Part 2: Streaming Behaviour and Content Discovery*. Brisbane: QUT University. Available at: https://eprints.qut.edu.au/239388/1/ASSVR_Part2.pdf

Lotz AD, Eklund O, and Soroka S (2022) Netflix, library analysis, and globalization: rethinking mass media flows. *Journal of Communication* 72(4): 511–521.

Lüders M and Sundet VS (2022) Conceptualizing the experiential affordances of watching online TV. *Television & New Media* 23(4): 335–351.

Mastrini G and Krakowiak F (2021) Netflix en Argentina: expansión acelerada y producción local escasa. ['Netflix in Argentina: Accelerated expansion and little local production']. *Comunicación Y Sociedad* 18: 1–23.

McKenzie J, Crosby P, and Shin SY (2023) Netflix chills and revamps its viewing metrics: preliminary analysis and opportunities for research. *Poetics* 96: 1–14.

Monaghan W (2023) Streaming queer content: LGBTQ media on BVOD and SVOD services in Australia. *Television & New Media* 821: 45–55. DOI: 10.1177/152747642312171.

Napoli PM (2009) *Media Diversity and Localism: Meaning and Metrics*. London: Routledge.

Napoli PM (2011) Exposure diversity reconsidered. *Journal of Information Policy* 1: 246–259.

Ofcom (2023) *Exploring Audience Expectations of Linear and on Demand Services*. London: Ofcom/Ipsos.

Pajkovic N (2022) Algorithms and taste-making: exposing the Netflix recommender system's operational logics. *Convergence* 28(1): 214–235.

Sanson K and Steirer G (2019) Hulu, streaming, and the contemporary television ecosystem. *Media, Culture & Society* 41(8): 1210–1227.

Scarlata A (2023) What are people watching in your area?': interrogating the role and reliability of the Netflix top 10 feature. *Critical Studies in Television* 18(1): 7–23.

Scarlata A and Lobato R (2023) Broadcaster video-on-demand in Australia: platforms, policy and local content. *Media International Australia*. doi: 10.1177/1329878X231177122

Smits R (2022) Circulation patterns, abundance, and scarcity: film availability in the online era. *Media Industries* 9(2): 41–58.

Smits R and Nikdel EW (2019) Beyond Netflix and Amazon: MUBI and the curation of on-demand film. *Studies in European Cinema* 16(1): 22–37.

Social Research Centre (2022) *The 2022 television consumer survey – summary Report*. Canberra: Department of Infrastructure, Transport, Regional Development, Communications and the Arts. Available at: https://www.infrastructure.gov.au/sites/default/files/documents/MediaContentConsumptionSurvey2022-FinalReport.pdf

Suzor N, Van Geelen T, Pappalardo K, et al. (2017) *Australian Consumer Access to Digital Content*. Australia: Australian Communications Consumer Action Network. Available at: https://eprints.qut.edu.au/111090/1/ACCAN_QUT_Digital%2BContent_web.pdf

Szczepanik P (2020) Channels and barriers of cross-border online circulation: central and Eastern Europe as a digital periphery. In: P Szczepanik, P Zahrádka, J Macek, et al. (eds) *Digital Peripheries: The Online Circulation of Audiovisual Content from the Small Market Perspective*. Cham, Switzerland: Springer International Publishing, 159–180.

Thurman N, Klatt A, Raj H, et al. (2023) Predicting streaming audiences for a channel's on-demand TV shows: discerning the influences of choice architecture, consumer agency, and content attributes. *Convergence*. doi: 10.1177/13548565231174590

Van Cuilenberg J (1999) On competition, access and diversity in media, old and new. *New Media & Society* 1(2): 183–207.

Van Esler M (2021) In plain sight: online TV interfaces as branding. *Television & New Media* 22(7): 727–742.

Varela Martínez D and Kaun A (2019) The Netflix experience: a user-focused approach to the Netflix recommendation algorithm. In: T Plothe and AN Bluck (eds) *Netflix at the Nexus: Content, Practice, and Production in the Age of Streaming Television*. New York: Peter Lang, 197–211.