International Journal of Communication 18(2024), 4813-4833 1932–8036/20240005

Smart TV Users and Interfaces: Who's in Control?

RAMON LOBATO
ALEXA SCARLATA
BRUNO SCHIVINSKI
RMIT University, Australia

Smart TVs—Internet-connected TV sets that deliver content via apps—have become the norm in consumer electronics markets, with non-connected "dumb" TVs largely disappearing from stores. Yet little is known about how smart TVs are used once installed in people's homes. This study examines the usage habits of Australian smart TV owners, focusing on their agency in relation to smart TV apps and interfaces. We present survey findings from a nationally representative sample of 1,069 Australians alongside results from structured device testing. We show that the ability to customize a smart TV is unevenly distributed across the population. Notably, a quarter of Australian users do not install apps, which raises questions about the power of TV manufacturers to nudge users' viewing through app preinstallation and prominence. We discuss the implications of these findings for current policy debates about prominence regulation.

Keywords: smart TV, TV apps, interactivity, user agency, interface, prominence, discoverability

Over the last decade, an important change has occurred within the hardware foundation of the global television culture. Smart TVs—Internet-connected TV sets that deliver content via apps—have become the norm in consumer electronics markets, with non-connected "dumb" TVs largely disappearing from stores. Household adoption of smart TVs is growing, reaching an estimated 77% of households in the United States and 63% in the United Kingdom (Hub Research, 2023; TechUK, 2023), with more than two billion smart TVs and connected TV devices now installed in homes worldwide (Rethink Research, 2023). Although the progressive replacement of older TVs with smart TVs is happening at different speeds in different countries, the general trajectory is irreversible. Like the mobile phone, the TV has become a convergent computing device equipped with its own operating system, user interface (UI), home screen, app store, search engine, and recommendation engine. Consequently, television has become a personalized and algorithmically curated medium.

Ramon Lobato: ramon.lobato@rmit.edu.au
Alexa Scarlata: alexa.scarlata@rmit.edu.au
Bruno Schivinski: bruno.schivinski@rmit.edu.au
Date submitted: 2023-11-23

Alongside this rapid adoption of smart TVs, a policy debate is emerging about the choice architecture of smart TVs and its implications for cultural consumption. A key issue here is the design strategies TV manufacturers use to nudge users toward certain apps over others. This phenomenon is known as *prominence*, which refers to "the location and prioritized placement of contents/services compared to others in time and/or space on a given interface" (García Leiva, 2024, p. 3). Prominence, like the related term discoverability—a broader concept also referring to the surfacing of materials within interactive recommendations and search results—is an important aspect of TV UI design, as it determines which apps and content are shown by default when the TV is turned on or when it returns to the home screen (García Leiva, 2021, 2024; Lobato & Scarlata, 2022; Mazzoli & Tambini, 2020). Prominence is typically determined through commercial negotiation "in which device manufacturers, app providers and platforms sell access to the most prominent positions within their UIs" (Johnson, 2020, p. 172). To date, the major partners for these prominence deals have been the U.S. streamers Netflix, Disney+, Amazon, Apple, and YouTube, which strike global deals with TV manufacturers such as Samsung and LG to ensure that their apps are preinstalled on smart TVs UIs, and that they occupy the most prominent positions on those UIs (Figure 1, Table 1).

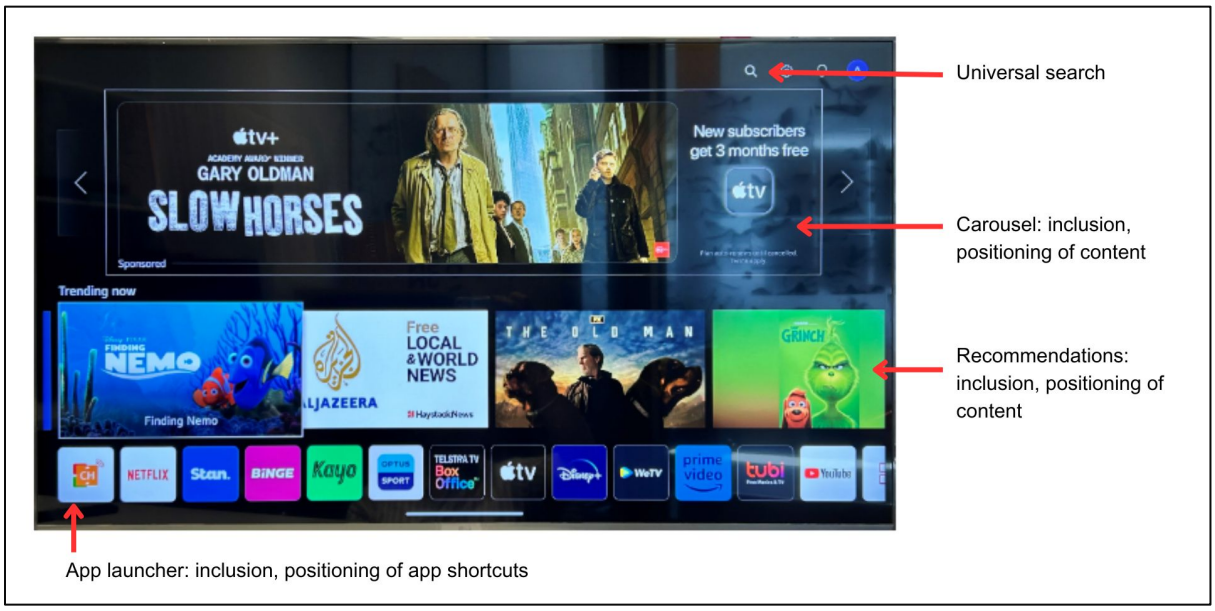

Figure 1. Prominence arrangements in the UI of a LG UQ90 43" smart TV. Source: Photograph by authors.

Table 1. Elements of Smart TV Prominence.

UI element	Factors determining prominence subject to commercial negotiation
Apps	Preinstallation of apps
	Availability of apps in app store
	Positioning and order of apps in launcher and store
	Whether customization of app order is allowed
Remote control	Branded shortcut buttons with app logos
Menus	Inclusion in menus
	Positioning and order in menus
	Prominence features such as rails and carousels
Recommendations	Inclusion in recommendations
	Positioning and order in recommendations
	Prominence features such as rails and carousels
Search results	Inclusion in search results
	Positioning and order in search results
	Prominence features such as rails and carousels

Note. Adapted from the Australian Government (2022) and Ofcom/MTM (2019).

Prominence deals are controversial for several reasons. Smaller, national, and specialist content providers may be disadvantaged in their visibility within the UI, as these smaller players cannot access the most important UI positions such as the remote control or first app launcher row slots, which are commonly presold globally to major streamers, such as Netflix and Prime Video (Ofcom/MTM, 2019). Concerns have also been raised about the cumulative effect of prominence deals in narrowing the diversity of audiovisual services accessible through smart TV. The former BBC Director-General Tony Hall famously warned that "we are sleepwalking towards a world in which children and young people barely encounter PSB [public-service broadcaster] content" on smart TV home screens as a result of commercial prominence deals that prioritize global streamers (Hall, 2018). Regulators and policy stakeholders in the United Kingdom (Ofcom/MTM, 2019), Australia (Australian Government, 2022), and the European Union (European Broadcasting Union [EBU], 2023; European Regulators Group for Audiovisual Media Services [ERGA], 2020; Ledger, 2023) have investigated these issues, leading in a few cases to the introduction of national laws designed to boost the prominence of national and public service broadcasters within the UI. Meanwhile, a related scholarly conversation focusing on "the role that interfaces and data/algorithms respectively play in shaping our experience of online TV" (Johnson, 2019, p. 108) has explored the cultural ramifications of prominence in TV UIs. This body of work, which includes critical studies of TV interfaces (Chamberlain, 2010; Hesmondhalgh & Lotz, 2020), TV device markets (Hesmondhalgh & Lobato, 2019), and prominence policies (García Leiva, 2024; Mazzoli & Tambini, 2020), draws attention to the need for open, transparent, diverse, and accessible app ecosystems and a fair and reasonable choice architecture in TV UIs, so that users can have access to a diversity of content providers whose content is displayed in an unbiased way.

Within these debates, the importance of prominence has largely been assumed rather than tested and is often discussed with reference to the user as a monolithic category, as opposed to actual users and their behaviors. Empirical research on smart TV prominence from an audience perspective is presently very limited.

As a result, we know relatively little about how people use their smart TVs in everyday life, the extent to which they rely on the default prominence arrangements of the TV, how active or passive they are in their installation of smart TV apps, and how these behaviors might vary according to demographics and other factors.

To address this knowledge gap, our study investigates how users are affected by smart TV prominence and the degree to which they customize prominence arrangements on their TVs. In particular, we focus on apps—their preinstallation, positioning, and ordering—and whether the app configuration is changed by users. We do this for two reasons: First, because apps provide a readily measurable and comparable index through which to explore the wider category of prominence; and second, because apps are, from the perspective of cultural analysis, the most consequential feature of the smart TV—apps determine what content the device can access, and thus what cultural experiences are available to the user.

We focus on a specific national territory: Australia. Australians are enthusiastic users of streaming television, and many have upgraded to smart TVs in the last few years (Australian Communications and Media Authority [ACMA], 2023). Yet Australia historically has a relatively low penetration of pay-TV set-top boxes and DVRs compared with the United States and Europe, and fewer digital terrestrial broadcast channels. Consequently, smart TVs represent the first experience for many Australians of advanced, Internet-connected, multichannel/multiservice television. Our research thus offers the opportunity to investigate the effects of prominence during a period of rapid smart TV adoption and thus transformation in national viewing habits.

We use two research methods in this study: a UI analysis of five smart TVs and a nationally representative survey of Australian smart TV users (n = 1,069). This approach enables a nondeterministic analysis that "appreciat[es] how agency and structure play off against each other" (Webster, 2006, p. 336) without resorting to caricatures of user sovereignty or technological/commercial determinism. Our study is guided by the following questions:

RQ1: What are the general characteristics of smart TV adoption in Australia?

RQ2: What are the default prominence arrangements for smart TVs sold in Australia?

RQ3: To what extent do users work around prominence arrangements in their everyday use of TV?

RQ4: How are these user practices related to demographic variables?

Overall, we find that the use of smart TVs in Australia is socially structured in ways that have clear relevance to the prominence debate. Some users are highly active, confident, and intentional in their use of smart TV apps; for these people, smart TV lives up to its promise as an interactive device that increases choice and participation. At the other extreme, we find many users who make minimal changes to their TV's default setup, which means that prominence arrangements as determined by the manufacturer are more likely to be consequential.

TV Apps, Agency, and Control

Empirical research that investigates smart TV prominence from the user's perspective is presently very limited. Johnson, Dempsey, and Hills (2020) used interview and survey methods to explore how British television viewers navigate connected TV interfaces and decide what to watch. Other excellent audience studies have investigated streaming behavior (Frey, 2021, on Netflix users) or multi-app TV "roaming" by audiences (Hill & Lee, 2022; Lüders & Sundet, 2022). However, these studies mostly explored video-on-demand (VOD) use in general, as opposed to smart TV use in particular. While offering many illuminating insights, these studies do not specifically address prominence in smart TV UIs or the degree to which users customize these prominence arrangements.

There is, however, a larger body of literature on the use of television device that can help contextualize these issues. Almost from the earliest years of broadcasting, television researchers have been interested in the general problem of *agency* among TV viewers (Steiner, 1952). This involved asking questions such as how actively viewers watched their TVs, how frequently they changed channels, and what factors shaped these various behaviors. Mass communication researchers used surveys, ratings analysis, and lab experiments to answer these questions, often with the aim of predicting audience flow between channels and inertia or "inheritance effects" (when viewers stay tuned to a channel after a program has ended). Through this work, scholars have developed theories to explain viewer agency with reference to variables such as program awareness and group viewing (Webster & Wakshlag, 1983). Scholars working in the uses and gratifications tradition have also explored the psychological and social factors that shape user behavior (Gunter, 1985). Alongside this mostly quantitative work, qualitative studies have used interviews and observation methods to understand the social contexts that shape how television devices are used in the home (Lull, 1982, 1988, 1990; Morley, 1986, 1992). Such work carefully theorizes audience agency and the varying levels of agency and control available to different members of the household. The common thread running through these studies, both quantitative and qualitative, is the need to account for both the agency and inertia of TV viewers.

Much of this research was conducted before the wide adoption of remote controls, multichannel television, and VCRs. As these devices became more common in households throughout the 1980s and 1990s, audience research focused on new forms of control and interactivity. Walker and Bellamy (1993) found that remote controls led to an increase in channel-changing behavior, as viewers no longer needed to get up from the couch to switch between channels—yet this new agency was not equally distributed, with young men found to be the most frequent users of remote controls. Studies of cable TV users similarly documented an increase in channel-changing activity compared with broadcast viewing (Heeter & Greenberg, 1985). Levy (1987) and Lin (1990) found that VCRs encouraged "active users rather than passive viewers" (Lin, 1990, p. 90), pointing to new behaviors such as ad-skipping, timeshifting, rewinding, and rewatching. Meanwhile, Gray's (1992) work on women and the VCR drew attention to the "existing household structures and familial ideology" that "become encoded in the new technology" (p. 154). Together, these studies of TV, VCR, and cable TV use showed that interactive TV devices generally increased user agency—a finding that we might expect to apply also to smart TVs. However, much of this research also highlights that user control is unequally distributed among users in ways that reflect household structure and power dynamics.

A key question in this literature is how to conceptualize control. The audience historian Richard Butsch (2000) has argued that early interactive TV devices such as the remote control and the VCR contributed to a long-term "incremental improvement of the position of the audience vis-a-vis media and advertisers' control of them" (p. 278). Seen from this perspective and within a tradition of research that foregrounds and normatively values active participation over presumptively more passive modes of consumption (Jenkins, 2006), the smart TV could certainly be understood as a device that empowers users by increasing their control of the device and the content it distributes. However, this is not the end of the story, as other work on television devices has identified new patterns of coercive, top-down control that may coexist with increased user agency. Notably, Carlson's (2006) study of TiVo identified a distinctive control dynamic in which viewers gain increased "control in their television viewing through the facilitation of time shifting and control over playback," while broadcasters and advertisers "regain control lost from the decline of schedules as an organizational device through the increasing use of surveillance" (p. 110). Carlson (2006) thus moved the debate beyond a zero-sum model of control in interactive television and toward a more sophisticated model in which user agency and industry control increase in tandem ("the fulcrum of control does not remain fixed, but moves upward along a Y-axis of total control"; p. 110). As this work reminds us, there is a history of thoughtful theorizing in communication and television studies about these questions of agency and control.

Other researchers have investigated programming and promotion strategies used by content providers to shape users' viewing choices—providing an important prehistory to what we now call prominence. Research on network TV programming strategies, such as schedule creep, hammocking (inserting a new series between a pair of established series), seamless transitions (giving viewers no chance to change the channel), and doubling (running multiple episodes sequentially), has shown how the TV schedule was optimized to "invite audience flow in and discourage flow out" (Eastman & Ferguson, 2013, p. 147; see also Bruun, 2019). Within this tradition, Webster's (1985, 1998, 2006, 2009) research has been particularly influential. Across many publications, Webster (2009) argued for an understanding of television audiences that is attentive to "the role of structure" (p. 228) and that can account both for top-down control and bottom-up agency. Challenging a rational-actor model of the audience, Webster instead emphasized the role of programming, scheduling, choice overload, inertia, and default rules as mechanisms for nudging users, arguing in one study that "how and when programs are scheduled [. . .] seems to determine choice" (Anast & Webster, 1985, p. 1). While Webster and his collaborators acknowledged the agency of individual users, they argued that industry control ("push media") cannot be ignored if we wish to understand audience behavior. Webster (2009) points to algorithmic recommendations as one form of push media that is now highly consequential in digital media environments and that "establishes the boundaries within which choices will be made" (p. 227).

Contemporary audience research continues this debate, extending what Uricchio (2004) described as the "narrative of shifting agency" between users, devices, and programmers (p. 178). Johnson (2019) argues that current TV interface design seeks to "encourage continuous viewing and minimize interactivity," thus offering "the illusion of control" rather than actual user control (p. 126). Recent studies of VOD use (Frey, 2021; Iordache, Loisen, & Van Audenhove, 2023; Johnson et al., 2020; Johnson, Sandvoss, & Grant, 2022; Lüders & Sundet, 2022) explore how users reflect on their navigation of those interfaces. Thurman, Klatt, Raj, and Taneja (2024) use people meter data to explore the effect of prominence on consumption

within a UK broadcaster VOD app. Other studies use interface analysis to understand the arrangement of elements visible in the VOD interface and to analyze the commercial logics that structure those design decisions (Johnson, 2017, 2019; Kelly, 2021). Scholars of television policy and regulation have also weighed in on the debate, addressing app preinstallation and prioritization in VOD services and considering public policy responses available to redress the exposure biases these industry control strategies may create (Farchy, Bideau, & Tallec, 2022; García Leiva, 2021; Mazzoli & Tambini, 2020).

In summary, the research approaches described above are all concerned with understanding agency and control in interactive television device use using different methods, theories, and analytical vocabularies. Our study advances this existing research in three ways. First, by attending to both top-down industry control strategies (prominence) and the ability to customize TVs and thus override default prominence settings (user agency), we seek to bridge a longstanding agency versus structure debate that has too often limited the scope of research. Second, we offer a novel focus on smart TV, a device that, unlike earlier VCRs, pay-TV set-top boxes, and PVRs, has yet to receive sustained scholarly attention. Third, our exploration of user agency foregrounds contemporary practices such as app downloading rather than earlier behaviors such as channel changing. In this way, we advance existing approaches to television user research to account for the far-reaching changes that have reshaped television distribution and consumer electronics in recent years while still allowing ongoing dialog with these earlier, foundational studies.

Methods: Interface Analysis and User Survey

This study uses two methods. The first method is an *interface (UI) analysis* of the leading brands of smart TVs sold in Australia. To understand the design of smart TV UIs and the commercial logics that structure this design, we purchased a representative sample of smart TVs for testing. We chose one smart TV (size 43" or closest match) from each of the top five manufacturers (Samsung, LG, Sony, Hisense, TCL), which together accounted for 86% of the Australian smart TV market (Lobato, Scarlata, & Schivinski, 2023). These selected TV brands also allowed us to capture all of the major smart TV operating systems available in the Australian market (Tizen, webOS, VIDAA, and Google TV). Following best practices in the literature (Ofcom/MTM, 2019), we then developed a testing rubric to capture data on the various elements that determine prominence within the UI, such as the positioning of apps on the home screen and the remote control. We also conducted title and genre search tests to determine which apps were integrated into and prioritized within TV search results. In this way, we were able to establish the degree of preferential treatment for partner apps within the smart TV UI. We excluded search results and recommendations from the analysis because differences in UI design make it difficult to consistently compare the integration, ordering, and prominence of recommendations (e.g., Google TV uses a curated home screen design that does not rely on app rows in the same way as other manufacturers).

Our second method was a *smart TV user survey*. To gain a general understanding of smart TV use across Australia, we commissioned a professional market research firm to undertake an online panel survey in December 2022. The structure of the sample, which consisted of 1,069 Australian smart TV users, was nationally representative according to age, gender, location (state), and income, closely matching the most recent national population data (Australian Bureau of Statistics, 2023). Respondents with limited smart TV experience (those who reported hardly ever or never using their smart TV or never using streaming apps)

were screened out so as not to skew the results. To assess the degree of user agency, the survey asked questions on a range of topics:

- *App downloads*: whether the user claims to know how to download apps from the smart TV's app store (anchored using a Likert scale from strongly disagree [1] to strongly agree [5]) and how many apps the user has downloaded from the smart TV's app store, if any (captured using a numerical scale from 0 to 50).
- *Home screen customization*: whether the user claims to know how to customize the order of apps in the app launcher row on the smart TV home screen (anchored using a Likert scale from strongly disagree [1] to strongly agree [5]).
- *Search*: how often users employ text search (search bar within apps or on TV home screen) and voice search (e.g., using voice button on remote control) to find content in apps and on their TV home screen (questions anchored using a Likert scale from never [0] to very often [5]).

Through these questions, we identified a cohort of users able to configure their devices to reflect their personal preferences, thereby using their TV with a high level of agency. Conversely, we identified users who made minimal or no changes to their TV and were, therefore, more likely to use the TV in its default settings. In addition, the survey included questions to capture users' views on a range of issues, including advertising, their satisfaction with the range of installed apps, app diversity, and preinstallation of local apps. The questions were anchored using Likert scales ranging from "strongly disagree" to "strongly agree." Survey methods, relying on self-reported behavior, were subject to well-known limitations, including incorrect recall and prestige bias, and these factors are likely to have skewed our results to some degree. For instance, our findings on user skills are likely to overstate the levels of skills in the population because of prestige bias.

Findings

We present our key findings, beginning with an overview of trends in smart TV usage across Australia and followed by a close examination of prominence arrangements in current smart TVs and related user behaviors.

What are the General Characteristics of Smart TV Adoption in Australia?

Our survey found that over half (56%) of the sample have a smart TV, the vast majority of which are manufactured by Samsung, LG, Sony, Hisense, or TCL. Of these manufacturers, Samsung, LG, and Hisense have their own operating systems (Tizen, webOS, VIDAA), whereas Sony and TCL use Google TV. An additional 11% of the sample uses a connected TV device, such as Apple TV or Chromecast. In other words, more than two-thirds of the overall sample overall have some form of connected TV access at home. This points to the rapid uptake of smart TVs and connected TV devices in Australia, with adoption having grown considerably over the last five years (c.f. Australian Communications and Media Authority, 2017, p. 74). As legacy TVs and dumb TVs phase out, we expect Australia's transition to smart TVs to be completed mostly by the end of this decade.

Of the 1,069 smart TV users that formed the study's core sample, 72% use their devices daily, with many owning more than one smart TV at home (mean = 1.6, SD = 0.84). Almost half (46%) purchased their device in the last two years, while nearly a quarter (22%) use a TV that is five or more years old, likely compromising user experience, app availability, and speed (Lobato & Scarlata, 2023). Overall, however, these findings paint a picture of the widespread and frequent use of smart TVs across Australia.

What are the Default Prominence Arrangements for Smart TVs Sold in Australia?

Our next step was to conduct an interface analysis to determine which apps were prominently positioned on TVs sold in Australia. This approach allowed us to assess the degree of commercial advantage given to certain apps over others. Our analysis considered two aspects of prominence: (1) the inclusion of apps in the app launcher row and (2) dedicated remote control shortcut buttons for apps.

Overall, our UI analysis revealed that U.S. apps are considerably more advantaged by prominence arrangements than Australian apps. Table 2 shows the percentage of TVs tested that include paid prominence for a selection of apps (pre-positioning in the app launcher row or the presence of a branded remote control button, e.g., a Netflix button). The sample of apps followed Australian media regulator ACMA's (2023) list of the most-used video apps in Australia. As Table 2 shows, there is a clear and consistent pattern of favoring U.S. apps over Australian apps in prominence deals.

Table 2. Smart TV Prominence—U.S. vs. Australian Apps (Device Testing).

	US APPS						***AUSTRALIAN APPS***						
	YouTube	**Netflix**	**Dis+**	**Prime Video**	**Paramount+**	**Apple TV+**	**Stan**	**Binge**	**ABC iview**	**SBS OD**	**7Plus**	**9Now**	**10 Play**
App launcher row	100%	100%	100%	100%	0%	100%	100%	60%	60%	0%	40%	60%	0%
Remote shortcuts	60%	100%	80%	100%	0%	0%	40%	0%	20%	0%	0%	0%	0%
	AVERAGE FOR US APPS: 63%						AVERAGE FOR AUSTRALIAN APPS: 26%						

We first consider the app launcher row. The app launcher, located on the TV home screen, is a row of shortcut icons for preinstalled apps that are built into the TV as a result of prominence deals (Ofcom/MTM, 2019). In the TVs we tested, the app launcher rows contained between 10 and 23 app shortcuts (Figure 2). Our interface analysis revealed that the U.S.-based streaming providers Netflix, YouTube, Amazon, Apple, and Disney are the major beneficiaries of prominence deals, with their apps being universally included in the app launcher row by all five of the smart TV manufacturers we considered in our study.

Figure 2. App shortcut rows on smart TV home screens, by manufacturer. Source: Photographs by authors.

There are some exceptions to this general pattern of U.S. app prominence. For example, the U.S. app Paramount+ (Paramount, 2024) was not prominent on any smart TVs, while the Australian app Stan was, in fact, prominent on all TVs tested, bucking the general trend. We also observed some interesting differences in how app launcher rows are configured. While the app shortcut row is generally reconfigurable by users, the Netflix shortcut on Hisense TVs is positioned first and cannot be moved or deleted. If the user tries to make any changes, an error message appears ("The position of this app cannot be changed"). As this example shows, certain manufacturers may allow prominence deals to override the basic functioning of the TV to ensure consistent and favorable positioning for the manufacturers' most important business partners.

Notwithstanding these peculiarities, the analysis revealed a clear pattern: the prominence of apps consistently favors U.S. apps in each of the TV models tested, while Australian apps are substantially less likely to be included in the app launcher row. When considered as a group across the top five smart TV manufacturers (Samsung, LG, TCL, Sony, Hisense), Australian apps were present in the app launcher 46% of the time compared with U.S. apps, which were present in the app launcher 77% of the time (Table 2).

A similar pattern was evident in our analysis of remote control shortcuts. The remote controls for each smart TV in our sample feature between 4 and 12 branded shortcut buttons (Figure 3). In each case, we studied the remote shortcuts to see which apps received their own branded buttons. Overall, there was

a clear difference in the overall visibility of U.S. versus Australian apps. On average, manufacturers gave remote shortcut buttons to the leading U.S. apps 49% of the time, compared with only 7% of the time for Australian apps (Table 2). Netflix (Netflix, 2024) and Prime Video (Amazon, 2024) were particularly prominent, appearing on all five remotes. Indeed, only two of five remotes tested had any buttons for local Australian-owned streaming services, with the local services Stan and ABC iView being the beneficiaries of these prominence arrangements.

From this analysis, we conclude that the commercial deals determining the prominence of apps on smart TV home screens and remote controls result in a clear asymmetry that favors a familiar group of large, U.S.-based apps. In practice, such arrangements reduce the relative visibility of local streaming services. However, this alone is not sufficient to explain any actual *effects* of prominence on users. The crucial question is how people respond to these prominence arrangements.

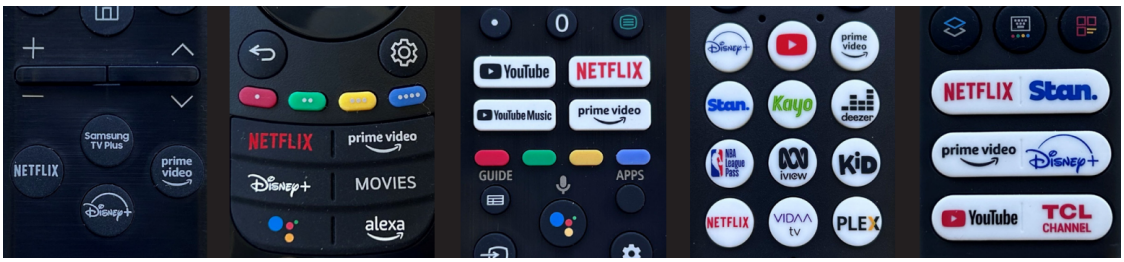

Figure 3. Shortcut buttons on Samsung, LG, Sony, Hisense, and TCL remote controls (L-R). Source: Photographs by authors.

To What Extent do Users Work Around Prominence Arrangements in Their Everyday Use of the TV?

To clarify the extent of user agency, our survey asked several questions to assess whether users "work around" default app prominence arrangements on their TV by changing the installed apps and their configuration or using the remote control in ways that negate prominence. Overall, we found that the tendency to do so is unevenly distributed among the Australian population.

Our first step was to investigate app downloading behavior. As noted above, smart TVs come with a limited number of popular apps preinstalled and determined as part of prominence deals. Many users will need to download additional apps from the TV's app store to increase the range and diversity of content that their TV can access. Hence, it can be assumed that users who install many apps have a higher degree of agency than those who do not install apps (cf. Roy Morgan, 2021). More than a quarter (28%) of the survey participants said that they had never downloaded an app from the TV's app store. An additional 20% had only downloaded one or two apps. The range of streaming content available to these users through the smart TV is therefore more likely to be determined by the manufacturer through preinstallation and prominence. Interestingly, 93% of respondents stated that they have "all the apps they need," suggesting high satisfaction with the range of available apps, albeit based on, in some cases, limited experience with the full range of apps available.

These findings challenge common assumptions about smart TV as an interactive device. They suggest that many users see smart TVs as a preconfigured device, rather than a device to be actively personalized. Nonetheless, we also found that, of the users who do not download apps, the vast majority (83%) use streaming apps, which suggests reliance on preinstalled apps and/or apps installed by other household members. Thus, the inability to download apps does not equate directly to a lack of access (digital exclusion), even though it does restrict the range of content potentially available.

A second way that users may respond to prominence arrangements is by customizing the order of apps in the app launcher row to make their favorite apps easier to access. As with mobile phones, this can typically be achieved through a long-press of the Enter/OK remote button, which then makes the app icons jiggle and allows the user to relocate them. Our survey revealed that only 44% of users claimed to know how to change the order of apps in this way. For these users, smart TV use remains shaped by, or, at the very least, made more complicated by, commercial prominence arrangements. At a practical level for users, this means a lot of unnecessary scrolling through app rows; more broadly, it reflects the unequal visibility of apps and, by extension, the content in those apps. However, the fact that fewer than half of users can change the order of apps makes sense given that manufacturers do not actively promote this feature to users, as they do not wish to dilute the value of their negotiated prominence deals.

Next, we investigated the frequency with which participants use the shortcut buttons on their smart TV remote control (e.g., the Netflix button or YouTube button). We found that over two-thirds (67%) of users have a remote control with one or more shortcut buttons, which aligns with our finding that three quarters of Australians are using smart TVs manufactured in the last five years or so, after shortcut buttons became commonplace in the Australian market. However, we found considerable variation in how *often* respondents used these buttons (never 18%, rarely 16%, sometimes 27%, often 21%, and very often 18%), suggesting that a sizeable minority of users ignore the buttons—possibly because they point to undesired or unsubscribed services—or use them rarely. This shows the limits of prominence deals in determining user behavior: Although shortcut buttons can ensure that the app is regularly visible to the user, they cannot force them to use these promoted services.

To further contextualize the use of shortcut buttons, we also asked the survey respondents to indicate which shortcut buttons they would include if they were designing their own remote controls. Users were invited to select four options from a long list of apps or to write their own choices (up to four). Netflix was the clear favorite here, with 75% of respondents choosing to include a Netflix button, followed by YouTube (56%) and Disney+ (32%) buttons. The public service broadcaster ABC iView (28.4%) was the most preferred Australian service button, coming in fourth place slightly ahead of Prime Video (28.3%). These results suggest that while the prominence arrangements for smart TV remote controls in the Australian market partly reflect consumer preferences, they also shape these same preferences to ensure that the leading U.S.-based apps remain top-of-mind for users.

Finally, our survey explored how frequently users search on their smart TVs and apps. Search, which requires the user to input a title or genre of interest, is a more active use of smart TV than browsing recommendations on the TV home screen. Consequently, search is also less likely to be structured by the home screen prominence arrangements analyzed in the previous section. Overall, we found fairly low levels

of reported use of search on smart TVs (Figure 4). Results from the aggregated data indicate that only 22% of the sample use the smart TV search bar often or very often, and even fewer (15%) use voice search often or very often (to exclude older-model TVs without voice search capability, we limited responses here to users with TVs less than four years old; n = 829). A higher proportion of the sample (37%) search for content within streaming apps often or very often, suggesting users are more comfortable with, or better served by, in-app search compared with searching via the smart TV UI.

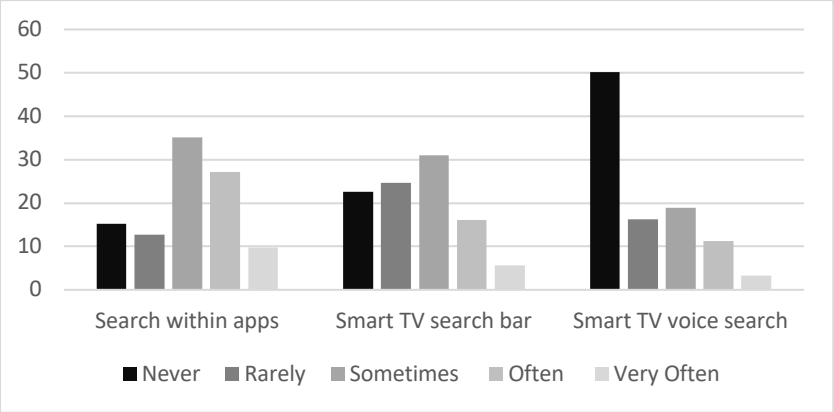

Figure 4. User search frequency—within apps, smart TV search, and voice search.

In summary, these findings suggest that the tendency of Australian smart TV users to "work around" prominence arrangements varies substantially. For some users, the apps that come preinstalled on a smart TV are likely to be the only apps they will ever use, and the positioning of these apps as determined by manufacturers is likely to be permanent. However, our survey findings suggest that prominence arrangements that govern remote control shortcut buttons and the integration and priority positioning of apps in search appear less consistently impactful because many users do not use these buttons or functions. In other words, some users effectively work around prominence simply by ignoring it.

How are These User Practices Related to Demographic Variables?

We now consider the role of demographic factors in shaping these behaviors. Kennedy and Holcombe-Jones (2022) observe that adoption studies of smart TVs "have largely overlooked the socio-economic circumstances of users" (p. 6). For this reason, they argue, "it is critical that we understand how [devices] are accessed, used, and experienced" (Kennedy & Holcombe-Jones, 2022, p. 2). Following this suggestion, our study sought to clarify who is actively using smart TVs in Australia and whether there is a socioeconomic pattern to these behaviors.

Overall, we found that gender, age, and education play an important role. The number of apps users download exhibited a negative correlation with age ($r = -0.15$; $p < 0.001$). Positive correlations were found between the number of apps downloaded and both education ($r = 0.07$; $p = 0.01$) and income ($r = 0.14$; $p < 0.001$). No significant correlation was observed between the number of downloaded apps and gender ($p = 0.89$). With respect to customization skills (ability to change app order), we found a negative

correlation with age ($r = -0.22$; $p < 0.001$). Positive correlations were found with gender ($r_{\text{ref 1:male}} = 0.12$; $p < 0.001$), education ($r = 0.10$; $p < 0.001$), and income ($r = 0.16$; $p < 0.001$).

In other words, the correlational analysis suggests that younger, well-educated, and affluent smart TV users are more likely than older, lower-income, and less-educated users to use their smart TV in an "active" way. The analysis of customization skills also revealed that gender was a factor, with male users more likely to claim stronger skills. Together, these findings confirm the general socioeconomic and gendered pattern of device use discussed in the literature review, suggesting that smart TV extends, rather than disrupts, this preexisting pattern.

Discussion

By integrating device testing with findings from a national user survey, this study brought together two distinct perspectives on smart TV prominence. Our interface analysis revealed that the smart TV UI is a highly structured environment designed for the maximum visibility of partner apps, which benefits some apps over others. Nonetheless, what really matters is how people engage with that structured environment. On this count, we found much variation among Australian users, with some using the TV in a highly active way and others using the TV in its default settings.

As our analysis shows, the effects of prominence are not uniform across the population. Nor are they all-powerful. In this study, we have sought to "end the binary formulation that pits media power against audience power" (Livingstone, 2018, p. 174) by charting a middle way through prior debates about structure and agency in TV devices. While acknowledging smart TV's power to determine "the boundaries within which choices will be made" (Webster, 2009, p. 227), we have shown that user choices cannot be *determined* by technology design and are ultimately the decisions of individuals—individuals with diverse, socially patterned ways of operating their devices. Neither sovereign agents nor passive dupes, smart TV users work both with and against managed interfaces that seek to nudge their behavior in particular directions.

A conceptual implication arising from our study is that the question of "who's in control" needs to be answered in the plural: Smart TVs have provided both manufacturers *and* users with greater control. As Carlson (2006) found in his important analysis of TiVo, an earlier connected TV technology, interactive devices do not necessarily redistribute control in a zero-sum way but may in fact increase control for multiple stakeholders simultaneously. Our study finds that smart TVs similarly expand the possibilities for user interaction while also creating a managed and monitored space in which every inch of screen real estate is commercially controlled and algorithmically monitored. In such an environment, our understanding of choice may need to be retheorized. It is arguably naïve to think that users can entirely ignore the choice architecture of the UI and "make their own decisions." Instead, we may need to reconceptualize choice as something that both shapes and is shaped by the UI in a complex tango of mutual influence.

Deciding *not* to choose is also an important part of this story. Some of what is seen in our results might be a return to nonselective behaviors, including a pushback against conscious decision making. As TV interfaces grow more complex and content options expand, choice fatigue increases. We also acknowledge that many users are adequately served by their TV's default settings and preinstalled apps and see no need

to change these. Additionally, user control varies between users and across time (a user might be highly selective one day and nonselective the next). These are all natural responses to the expanded choice architecture of smart TV, and we acknowledge that many users will find pleasure and empowerment in their own inertia. For this reason, our analysis did not seek to make normative claims about user agency but to explain its extent and relationship to prominence arrangements.

In the months since we submitted this article, developments in Australia have underscored the importance of TV prominence as a policy issue. In November 2023, the Australian federal government introduced the Media Reform (Prominence and Antisiphoning) Bill, which was passed into law in July 2024. This new law requires that all manufacturers of smart TVs preinstall the apps of Australian broadcast TV networks, including the two public service broadcasters, and that these apps are made available in the TV's app launcher. Like other prominence laws being implemented and considered elsewhere, this measure goes some way toward redressing the balance of power within the UI between major global streamers and national broadcasters. Our research findings, as presented here, suggest that this kind of prominence regulation should ensure a somewhat more balanced and competitive UI marketplace, especially for the majority of users who do not download apps or change the order of apps on the home screen. In other words, we expect this law to mildly "localize" the preconfiguration of smart TV UIs by manufacturers. The law also now clearly identifies the TV UI as a legitimate space for public policy intervention, with manufacturers and platform operators under notice that their UI designs will be closely scrutinized in the future.

This leaves unresolved other issues related to smart TV UIs, including recommendation bias, search bias, and advertising disclosure—with these issues now deferred to a wider digital competition agenda, which we expect will play a major role in shaping the communication research and policy conversations of the coming decade. There is more than TV at stake here, especially given that "prominence wars" in other sectors are now raging. Current concerns over audio prominence—for example, the discoverability of radio stations within smart speakers—represent a new frontier for this debate. Another example relates to the dashboards of connected cars, which increasingly favor apps such as Spotify over traditional radio stations.

Clearly, the prominence debate cannot be settled by any single policy intervention and has a long way to play out. In this context, we hope that the research approach outlined in this study may provide a useful template for regulators, scholars, and public policy stakeholders seeking to understand the effects of prominence. Future research in this area will need to consider prominence arrangements that are beyond the scope of the present article, such as search prominence, personalization, and AI-driven dynamic UI design. These and other emerging challenges for TV interface research require constant innovation in methods to keep pace with rapid changes in UI design. What remains important, however, is the need for research to resist a determinist account of the interface by engaging with existing user practices.

References

Amazon. (2024). *Prime Video app* (Version number 3.0.377.3347) [Smart TV application software]. Retrieved from Google TV, VIDAA, Tizen and webOS smart TV app stores

Anast, A., & Webster, J. G. (1985, August 3–6). *The role of television program content and scheduling in patterns of choice*. Paper presented at the Annual Meeting of the Association for Education in Journalism and Mass Communication, Memphis, Tennessee.

Australian Bureau of Statistics. (2023). *Population datasets*. Retrieved from https://www.abs.gov.au/statistics

Australian Communications and Media Authority. (2017, November). *Communications report 2016/17*. Retrieved from https://www.acma.gov.au/sites/default/files/2019-08/Communications-report-2016-17-pdf.pdf

Australian Communications and Media Authority. (2023, February). *Communications and media in Australia: How we watch and listen to content*. Canberra, Australia: Australian Communications and Media Authority. Retrieved from https://www.acma.gov.au/publications/2023-02/report/communications-and-media-australia-how-we-watch-and-listen-content

Australian Government. (2022, December). *Prominence framework for connected television devices proposals paper*. Retrieved from https://www.infrastructure.gov.au/sites/default/files/documents/prominence-framework-connected-tv-devices-proposals-paper.pdf

Bruun, H. (2019). *Re-scheduling television in the digital era.* Oxford, UK: Taylor and Francis.

Butsch, R. (2000). *The making of American audiences: From stage to television, 1750–1990*. Cambridge, UK: Cambridge University Press.

Carlson, M. (2006). Tapping into TiVo: Digital video recorders and the transition from schedules to surveillance in television. *New Media & Society, 8*(1), 97–115. doi:10.1177/1461444806059877

Chamberlain, D. (2010). Television interfaces. *Journal of Popular Film & Television, 38*(2), 84–88. doi:10.1080/01956051.2010.483354

Eastman, S. T., & Ferguson, D. A. (2013). *Media programming: Strategies and practices* (9th ed.). Boston, MA: Wadsworth.

European Broadcasting Union. (2023). *Public service media and prominence: Finding the content that matters online*. Geneva, Switzerland. Retrieved from https://www.ebu.ch/guides/open/public-service-media-and-prominence-finding-the-content-that-matters-online

European Regulators Group for Audiovisual Media Services. (2020). *Ensuring prominence and access of audiovisual media content to all platforms (Findability)*. Retrieved from https://erga-online.eu/wp-content/uploads/2021/01/ERGA_SG3_2020_Report_Art.131_final.pdf

Farchy, J., Bideau, G., & 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. doi:10.1080/10286632.2021.1967944

Frey, M. (2021). *Netflix recommends: Algorithms, film choice, and the history of taste*. Oakland: University of California Press.

García Leiva, M. T. (2021). VoD platforms and prominence: A European regulatory approach. *Media International Australia, 180*(1), 101–115. doi:10.1177/1329878X20967456

García Leiva, M. T. (2024). Audiovisual prominence and discoverability in Europe: Stakeholders' alliances under construction. *Convergence*. Advance online publication. doi:10.1177/13548565241260490

Gray, A. (1992). *Video playtime: The gendering of a leisure technology*. London, UK: Routledge.

Gunter, B. (1985). Determinants of television viewing preferences. In D. Zillmann & J. Bryant (Eds.), *Selective exposure to communication* (pp. 93–112). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hall, T. (2018, June 11). *Tony Hall's speech to parliamentarians on prominence*. BBC Media Centre. Retrieved from https://www.bbc.co.uk/mediacentre/speeches/2018/tony-hall-prominence

Heeter, C., & Greenberg, B. (1985). Cable and program choice. In D. Zillmann & J. Bryant (Eds.), *Selective exposure to communication* (pp. 203–224). Hillsdale, NJ: Lawrence Erlbaum Associates.

Hesmondhalgh, D., & Lobato, R. (2019). Television device ecologies, prominence and datafication: The neglected importance of the set-top box. *Media, Culture and Society*, *41*(7), 958–974. doi:10.1177/0163443719857615

Hesmondhalgh, D., & Lotz, A. (2020). Video screen interfaces as new sites of media circulation power. *International Journal of Communication, 14*, 386–409. https://ijoc.org/index.php/ijoc/article/view/13261

Hill, A., & Lee, J. C. (2021). Roamers: Audiences on the move across entertainment platforms in Southeast Asia. *Javnost - The Public*, *29*(1), 98–114. doi:10.1080/13183222.2021.1932985

Hub Research. (2023). *Connected home 2023* (report). Retrieved from https://www.hubresearchllc.com/reports/?category=2023&title=2023-connected-home

Iordache, C., Loisen, J., & Van Audenhove, L. (2023). Integrating discoverability and prominence in video-on-demand consumption choices: A qualitative user study in Belgium. *International Communication Gazette.* Advance online publication. doi:10.1177/17480485231191898

Jenkins, H. (2006). *Convergence culture: Where old and new media collide*. New York: New York University Press.

Johnson, C. (2017). Beyond catch-up: VoD interfaces, ITV Hub and the repositioning of television online. *Critical Studies in Television, 12*(2), 121–138. doi:10.1177/1749602017698159

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

Johnson, C. (2020). The appisation of television: TV apps, discoverability and the software, device and platform ecologies of the internet era. *Critical Studies in Television, 15*(2), 165–182. doi:10.1177/1749602020911823

Johnson, C., Dempsey, L., & Hills, M. (2020). *Routes to content: How people decide what TV to watch.* University of Huddersfield, UK: Centre for Participatory Cultures. Retrieved from https://research.hud.ac.uk/media/assets/document/schools/artdesignandarchitecture/research/RoutestoContentReportFinal28Jan20.pdf

Johnson, C., Sandvoss, C., & Grant, A. (2022). *The impact of video-on-demand on tv viewing in the UK: Routes to content after COVID-19* (interim report). University of Huddersfield, UK: Centre for Participatory Cultures. Retrieved from https://screen-network.org.uk/wp-content/uploads/2022/06/Routes-to-content-june-22.pdf

Kelly, J. P. (2021). "Recommended for you": A distant reading of BBC iPlayer. *Critical Studies in Television, 16*(3), 264–285. doi:10.1177/17496020211024201

Kennedy, J., & Holcombe-James, I. (2022). "It's almost impossible to buy a dumb TV": Experiences of automated decision-making and smart technologies in low-income homes. *Telematics and Informatics, 68*(101767), 1–8. doi:10.1016/j.tele.2021.101767

Ledger, M. (2023). *Towards coherent rules on the prominence of media content on online platforms and digital devices*. Brussels, Belgium: Centre on Regulation in Europe. Retrieved from https://cerre.eu/publications/towards-coherent-rules-on-the-prominence-of-media-content-on-online-platforms-and-digital-services/

Levy, M. R. (1987). VCR use and the concept of audience activity. *Communication Quarterly, 35*(3), 267–275. doi:10.1080/01463378709369689

Lin, C. A. (1990). Audience activity and VCR use. In J. R. Dobrow (Ed.), *Social and cultural aspects of VCR use* (pp. 75–92). Hillsdale, NJ: Lawrence Erlbaum Associates.

Livingstone, S. (2019). Audiences in an age of datafication: Critical questions for media research. *Television & New Media*, *20*(2), 170–183. doi:10.1177/1527476418811118

Lobato, R., & Scarlata, A. (2022). Regulating discoverability in subscription video-on-demand services. In T. Flew & F. Martin (Eds.), *Digital platform regulation: Global perspectives on Internet governance* (pp. 209–227). Basingstoke, UK: Palgrave.

Lobato, R., & Scarlata, A. (2023, January 11). Why your smart TV might not last as long as you'd hope. *Choice*. Retrieved from https://www.choice.com.au/electronics-and-technology/home-entertainment/tvs-and-projectors/articles/op-ed-smart-tv-lifespan

Lobato, R., Scarlata, A., & Schivinski, B. (2023). *Smart TVs and local content prominence* (report). RMIT University. Retrieved from https://apo.org.au/node/321605

Lüders, M., & Sundet, V. S. (2022). Conceptualizing the experiential affordances of watching online TV. *Television & New Media*, *23*(4), 335–351. doi:10.1177/15274764211010943

Lull, J. (1982). How families select television programs: A mass-observational study. *Journal of Broadcasting & Electronic Media, 26*(4), 801–811. doi:10.1080/08838158209364049

Lull, J. (1988). Constructing rituals of extension through family television viewing. In J. Lull (Ed.), *World families watch television* (pp. 237–259). Newbury Park, CA: Sage Publications

Lull, J. (1990). *Inside family viewing: Ethnographic research on television's audiences.* London, UK: Routledge.

Mazzoli, E. M., & Tambini, D. (2020). *Prioritisation uncovered: The discoverability of public interest content online*. Council of Europe Study DGI (2020)19. Retrieved from https://rm.coe.int/publication-content-prioritisation-report/1680a07a57

Morley, D. (1986). *Family television: Cultural power and domestic leisure*. London, UK: Comedia Pub. Group.

Morley, D. (1992). *Television, audiences, and cultural studies.* London, UK: Routledge.

Netflix. (2024). *Netflix app* (Version 16.47.0) [Smart TV application software]. Retrieved from Google TV, VIDAA, Tizen and webOS smart TV app stores.

Ofcom/MTM. (2019, May). *Review of TV user interfaces in the UK market*. Retrieved from https://www.ofcom.org.uk/__data/assets/pdf_file/0022/154390/mtm-review-tv-user-interfaces-uk-market-full-report.pdf

Paramount. (2024). *Paramount+ app* (Version 15.0.36) [Smart TV application software]. Retrieved from Google TV, VIDAA, Tizen and webOS smart TV app stores.

Rethink Research. (2023, October 20). RDK crushed on global stage between rising Android TV and insurgent Harmony OS [Analyst presentation]. Retrieved from https://app.livestorm.co/rethink-technology-research/rdk-crushed-on-global-stage-between-rising-android-tv-and-insurgent-harmonyos/live?s=431bd1ec-e79d-46ff-941b-48c4308579d7#/qa

Roy Morgan. (2021). Consumer views and use of web browsers and search engines (final report). Canberra, Australia: Australian Competition & Consumer Commission. Retrieved from https://www.accc.gov.au/system/files/DPB%20-%20DPSI%20-%20September%202021%20-%20ACCC%20Consumer%20Survey%20-%20Roy%20Morgan%20Report%20-%20FINAL%20-%2017%20September%202021.pdf

Steiner, P. O. (1952). Program patterns and preferences, and the workability of competition in radio broadcasting. *Quarterly Journal of Economics, 66*, 194–223. doi:10.2307/1882942

TechUK. (2023, June). *The state of the connected home*. Retrieved from https://www.techuk.org/asset/B3119D46-14CB-438B-A2180766F0792466/

Thurman, N., Klatt, A., Raj, H., & Taneja, H. (2024). Predicting streaming audiences for a channel's on-demand TV shows: Discerning the influences of choice architecture, consumer agency, and content attributes. *Convergence, 30*(3), 1254–1270. doi:10.1177/13548565231174590

Uricchio, W. (2004). Television's next generation: Technology/interface, culture/flow. In L. Spigel & J. Olssen (Eds.), *Television after TV: Essays on a medium in transition* (pp. 163–182). Durham, NC: Duke University Press.

Walker, J. R., & Bellamy, R. V., Jr. (Eds.). (1993). Gratifications derived from remote control devices: Survey of adult RCD use. In J. R. Walker & R. V. Bellamy (Eds.), *Remote control device in the new age of television* (pp. 103–111). New York, NY: Praeger.

Webster, J. G. (1985). Program audience duplication: A study of television inheritance effects. *Journal of Broadcasting & Electronic Media, 29*, 121–133. doi:10.1080/08838158509386571

Webster, J. G. (1998). The audience. *Journal of Broadcasting & Electronic Media, 42*(2), 190–207. doi:10.1080/08838159809364443

Webster, J. G. (2006). Audience flow past and present: Television inheritance effects reconsidered. *Journal of Broadcasting & Electronic Media, 50*(2), 323–337. doi:10.1207/s15506878jobem5002_9

Webster, J. G. (2009). The role of structure in media choice. In T. Hartmann (Ed.), *Media choice: A theoretical and empirical overview* (pp. 221–233). New York, NY: Routledge.

Webster, J. G., & Wakshlag J. J. (1983). A theory of television program choice. *Communications Research, 10*(4), 430–446. doi:10.1177/009365083010004002