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An Analysis of the Audience of a Digital Subscription Magazine: Findings About Reach, Viewing Frequency, and Repeat-Viewing for Media Aggregators, Planners, and Advertisers

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The digital media landscape presents aggregators, planners and advertisers with challenges, but also offers the prospect of improved audience measurement. Our case study shows how informative metrics can be derived from analysis of granular industry data. We describe how heterogeneous subscribers to a digital magazine view weekly issues and content sections over an eleven-week period. All subscribers view the magazine at least once, but only a third repeat-view from week-to-week and just one percent view every issue. Considering our findings, we advise downward adjustments to expected reach, expected viewing frequency, and expected repeat-viewing of magazine issues, content sections, and advertisements.

Management Slant

- To describe the viewing of digital subscription magazines, we show how important it is to analyze granular industry data and calculate direct metrics.
- With granular data, media planners gain more precise information about the way digital magazines, and their content and advertisements, are viewed. They can calculate the actual audience size exposed to a campaign and, therefore, shift away from using circulation rates to infer opportunities-to-see.
- Our analysis offers media planners and advertisers guidance for the placement of advertising to achieve media objectives. For reach objectives, placement will be in widely read content sections, whereas for frequency objectives the focus is sections with higher repeat-viewing.
- For advertisers interested in content relevance, the insight that average repeat-viewing rates do not vary much across content sections should inform contextual advertising placement. Consideration also should be given to what lies behind the averages, including differences in repeat-viewing by light and heavy viewers.
- More generally, media aggregators, planners and advertisers can make use of our case study results, together with findings from studies of related media, as benchmarks when analyzing fresh data for the magazine of interest, or other titles in the publisher's portfolio, or titles in other publishers' portfolios.

Keywords: Audience analysis; subscription media; digital magazines; reach and viewing frequency; repeat-viewing; media; consumption

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INTRODUCTION

The outlook for advertisers who use digital subscription services, such as those provided by the *Wall Street Journal* or the *New Yorker* magazine, is decidedly mixed. On the one hand, media proliferation means viewers[1] have abundant choice – but, with so much competition for attention, it is often hard for advertisers to cut through to their specific target audiences. On the other hand, there is unprecedented scope for digital subscription services and media aggregators to offer advertisers ways to expose their target audiences to context-specific content. Indeed, media experts are promoting the importance of context-specific placement to drive attention and, in turn, responsiveness to advertising (Andrew 2019). Faced with such a mix of challenges and opportunities, it is vital for media aggregators, planners and advertisers to be able to describe how audiences view media. The key to achieving this is improved measurement – specifically the use of more granular industry data to calculate viewing metrics (WARC Best Practice 2022a).

Many metrics are used to assess media viewing. For instance, in the planning and assessment of media schedules, estimates of audience sizes are used to determine a campaign's expected reach and frequency (Katz 2022). Despite routine use of these metrics over several decades (Smit and Neijens 2011), measurement problems have been persistent and significant, prompting calls for improvement (Napoli 2011). For example, opportunity-to-see, the probability that an individual will be exposed to a media vehicle, can be hard to estimate (Cannon, Leckenby, and Abernethy 2002) and relates to the vehicle itself, not actual exposure of those in the target audience to an advertisement (Hallward 2008). This, in turn, casts doubt on the accuracy of calculations of effective reach and frequency (Cannon and Riordan 1994). Measurement-related challenges are compounded by audience fragmentation, the impact of this on sampling, and the representation of the long tail of audiences (namely, how best to represent the numerous light viewers of media) (Taneja 2020), leading to further calls for improved exposure data (Wu and Taneja 2021).

At the same time, in digital environments unprecedented amounts of data are now available, which provide more granularity with respect to viewing by the whole audience, especially subscribers. This is timely and relevant as media, such as news-brands and magazines and subscription television services, are looking for ways to drive subscriber engagement as well as to use their granular data for targeting and reaching audiences with both context-relevant content and context-specific advertising (WARC Best Practice 2023).

As a case study, we examine the viewing of a digital subscription magazine and illustrate the insights that can be derived from metrics calculated from audience viewing data. Granular data are used to evaluate three key metrics of media planning – reach, viewing frequency, and repeat-viewing rates - as well as the absolute size of the audience for the service. Media aggregators can use insights derived from these analyses in conversations with planners and advertisers.

In digital environments unprecedented amounts of data are now available.

Our study also addresses two research themes that have been highlighted recently (Campbell 2023). First, we respond to the call to recheck underlying assumptions and models in the face of an ever-changing media landscape. We reconsider some of the established models and findings from earlier studies now that the media landscape is predominantly digital and largely subscription based. Where models and findings remain relevant, they can be used as benchmarks for the analysis of fresh data. Second, we begin to respond to the call for better understanding of viewer attention. Analysis of granular data for the viewing of digital media services offers a way to measure attention that improves on traditional indirect measures.

In the following section we provide a brief overview of media and audience metrics, using this to frame our research questions. Discussed next are the data and approach employed. Findings are reported and discussed. The article concludes with an overview of practical and technical implications. Five broad themes are considered. First, what is the reach, the number of subscribers that view a magazine issue or content section? Second, what is the viewing frequency, the number of times subscribers view the magazine or content section? Third, what is the repeat-viewing rate of the magazine, and of content sections, from issue-to-issue? Fourth, does the repeat-viewing rate of content sections vary with each section's share of the magazine? Finally, is there variance in these audience metrics across heterogeneous heavy and light viewers?

MEDIA AND AUDIENCE METRICS

To frame our research questions, we first define and review some commonly used media and audience metrics. Conceptually, an important distinction is drawn between *gross media vehicle* metrics and what we call *precise media audience* metrics. Some of the most widely used metrics are listed in Table 1.

As the definitions in Table 1 show, *gross metrics* capture high-level information about the *media vehicle* (and therefore are only proxy measures of the media audience), whereas the *precise metrics* refer specifically to the *media audience* (and therefore ought to be more accurate measures of the viewing behavior of the media audience). Despite these conceptual distinctions, proxy measures are often

used in commercial settings – for example, vehicle distribution might be used as an approximation for the size of audience that sees an advertisement. Indeed, vehicle circulation and vehicle distribution as proxies for audience exposure have often been used in media planning. This extends to typical advertising pricing and audience management metrics based on gross media metrics. For example, cost per thousand (CPT), the currency for buying advertising space in traditional media, is based on vehicle circulation or vehicle distribution numbers combined with rate-card data from publishers.

Moreover, advertising campaigns themselves are invariably defined by Gross Rating Points (GRPs) for the medium or schedule. Despite the widespread use of GRPs in commercial settings, they are based on predicting the vehicle's gross audience, not information on campaign reach or frequency. For example, 100 GRPs could be 100 people seeing the medium once, or 25 people seeing the medium four times (Rossiter and Bellman 2005). It also matters whether these people are in the advertiser's target audience – 100 people or 100 people in the target audience?

Historically, reliance on proxy measures arose from data challenges with circulation audits and viewing surveys. These problems are long-standing, with repeated calls over many years for better measures of audience size and viewing behavior (*e.g.*, Findley et al. 2020; Kinnear, Horne, and Zingery 1986; WARC Best Practice 2022a).

Metrics such as vehicle exposure have been routinely reported by syndicated services, for example, MRI-Simmons in USA, the National Readership Survey (NRS) in UK, and Nielsen Digital Ratings Monthly (DRM) fused with the Enhanced Media Metrics (EMMA) in Australia. Typically, for magazines, these services have defined viewing as ever looking at a copy of the title in a period, and they report on the quantity and demographics of viewers exposed to the title (Green 2010).

These syndicated services face challenges that include a decline in the willingness of viewers to participate in surveys; responders being different to non-responders; and the fact that responses are based on self-reported recall (Green 2014a). One of several concerns is that "people tend to overestimate their frequency of viewing a program when they are explicitly asked about this" (Barwise, Ehrenberg, and Goodhardt 1982, p.28). Surveys also tend to be limited to a small number of titles, and they usually

Table 1 Media and Audience Metrics

		Type of Metric	
Metric	*Definition – Expressed in Terms of Magazine Viewing*	**Gross Media Vehicle Metric**	**Precise Media Audience Metric**
Vehicle Circulation	Number of magazine copies a publisher commits to selling in a specific period. As a proxy, the measure provides a snapshot of predicted gross audience of a magazine. Widely used in commercial settings.	✓	
Vehicle Distribution	Number of magazine copies that are distributed. As a proxy, the measure approximates the number of copies sold that contain an advertisement. Widely used in commercial settings.	✓	
Media currency	Cost per thousand (CPT) is the currency for buying advertising space in a magazine, typically based on gross proxy measures.	✓	
Audience currency	Gross rating points (GRP) for medium or schedule are typically based on a prediction of the magazine's gross audience.	✓	
Reach	The total number of viewers exposed to an advertisement in a magazine, at least once over a number of issues (*e.g.*, in one issue, two issues, and so forth).		✓
Viewing Frequency	The number of times viewers are exposed to an advertisement in a magazine over a number of issues.		✓
Repeat-Viewing	The extent to which viewers of one issue of a magazine also view another issue of the magazine. Sometimes defined as the extent to which viewers in one period also view in another (equal-length) period.		✓
Note	Where the specific target audience for an advertisement is known, definitions can be even more precise: • Reach is the total target audience exposed to an advertisement, in media, at least once in a period (*e.g.*, in a week, a month, or over a campaign period). • Viewing frequency is the number of times the target audience is exposed to an advertisement, in media, in the period. • Repeat-viewing is the extent to which those in the target audience who are exposed to one issue of the magazine (containing an advertisement) are also exposed to another issue of the magazine (also containing the advertisement).		

measure magazine viewing, not advertisements seen (Green 2014b).

Additionally, viewing is often measured over a period, not with reference to an issue, which means reporting tends to be on an average-issue basis (Smit and Neijens 2011). A person may have picked up the magazine recently, but it is unknown which issue has been seen or which pages of an issue have been seen. Therefore, the viewing metric "assumes that the likelihood they [the viewer] will see any particular ad is equal across titles and pages" (Green 2014b, p. 4).

The reporting of average issue viewing does not provide feedback on whether the audience viewing the content does so consistently (every issue, for instance) or infrequently (just the occasional issue). And yet it is known from other survey evidence that "many readers shift their allocation of attention from issue-to-issue" (McDonald 2011, p. 3). Nor is it known whether a single issue is viewed more than once. Furthermore, usually there is no reporting of in-media viewing – that is, no reporting of the amount and type of content that was exposed to the audience, and yet this is crucial to know because "magazine reading, like virtually all media consumption, is usually partial" (Friesner and Collins 2013, p. 15).

By contrast, for digital media, site-centric metrics can be passively generated by analyzing server log files or clickstream files. The data are granular. The measures are direct. They better capture audience viewing of the media vehicle, of the content, *and* of the advertising. More details are provided in our Research Method section. Surveys either are not required, or they are used to augment the information from site-centric metrics.

Reach and Viewing Frequency

Given the limitations of gross metrics, attention turns to more precise metrics such as reach and viewing frequency – both of which are potentially relevant to media planners and advertisers. Crucial to the effectiveness of an advertising campaign is to have an appropriate pattern of reach combined with an effective frequency of exposure (Rossiter and Bellman 2005). Proposing the right frequency of advertising exposure is important: too few exposures will result in an ineffective campaign, too many will lead to undue cost and wastage (Webster, Phalen, and Lichty 2014).

Even here, however, there are data and measurement challenges. Historically, viewing surveys have been used to collect information on exposure, but these may not show how often a magazine is viewed, let alone how often a content section or advertisement is seen. To elaborate, media aggregators often build a range of branded content under the media title. Usually, this branded content is repeated from issue to issue. For example, the *New York Times* has business and politics sections in most issues. However, viewing surveys typically only report reach on the vehicle rather than the viewing of in-media content sections. This leads to the erroneous assumption that reach is the same irrespective of where an advertisement is placed – whereas, in practice, subscribers are likely to be more selective in their viewing. Some newer syndicated services, such as EMMA, report the reach of sections of newspapers for a limited number of titles. With site-centric metrics, even greater detail and accuracy is achieved.

Despite data and measurement challenges, exposure-based models using reach and frequency data have been routinely deployed by media planners for over 50 years (Leckenby and Hong 1998) and remain prominent in an age of digital advertising (Cheong, De Gregorio, and Kim 2010). For several decades, expected reach and viewing frequencies in media schedules have been routinely described by the Negative Binomial Distribution (NBD) (Ehrenberg, Uncles, and Goodhardt 2004; Goodhardt, Ehrenberg, and Chatfield 1984). For those reached, the NBD describes viewing incidence and rate of viewing – when and how often – for media such as TV, newspapers and magazines. Conceivably, these models become even more useful when based on site-centric metrics. The availability of more accurate data – such as the granular site-centric data used in this study – is likely to provide greater insight into effective frequency of exposure and offer a better idea of where to place advertisements across and within issues.

This discussion sets the scene for our first two research questions. For a digital subscription magazine, where granular site-centric data are available, we ask:

> RQ1: What is the reach of magazine issues and content sections?
> RQ2: What is the viewing frequency of magazine issues and content sections?

Importantly, answers to these questions draw on granular data and direct metrics, thereby avoiding many of the data challenges that have beset analysts in earlier decades.

Repeat-Viewing

Repeat-viewing, another important metric for media planners and advertisers, holds the promise of capturing whether the target audience is repeatedly exposed to an advertisement and, therefore, whether the exposure frequency is likely to be effective. Once again, the extent to which this goal is achieved depends on whether the focus is the media vehicle or the advertisement; mostly, in practice, consideration has been given to repeat-viewing of the media vehicle, with this then being used as a proxy for repeat-viewing of the advertisement.

Published repeat-viewing studies have mainly considered traditional TV, with some of the data and measurement challenges mentioned earlier re-surfacing in this different context. For instance, originally the main source of TV viewing data was from self-report surveys where respondents were asked to note (in a diary) or recall (in a questionnaire) whether they watched a previous episode or simply whether they viewed in a previous period. In time, an additional source of data came from electronic measurement and so-called people-meters (Andrew 2019).

Major published repeat-viewing studies are listed in Table 2. This highlights the use of data from diary-based surveys and, later, from people-meters. Both these methods require the active participation of the audience being measured. Diaries need to be completed at the time of viewing or soon after, and people-meters require household members to select their button when they enter or leave the room.

Additionally, commercial panels tend to capture usage from a single user environment (home *or* work) and often sample bases are not from a stable universe (where, for instance, a percentage of their audience is replaced each month). This process of sample replacement limits the ability to measure the repeat-viewing of individuals.

Despite the limitations of diary-based surveys and people-meters, these sources have provided media planners and advertisers with important insights. For example, it may be believed (or wished) that people conscientiously watch every episode of a TV series from day-to-day or week-to-week, but studies show that aggregate repeat-viewing rates are no more than 30–40% (Danaher and Dagger 2012;

Table 2 Summary of Major Repeat-Viewing Studies

			Medium		Analysis Level	Collection Instrument			Findings
Study	Time Period	Sample Size	TV	Mag	Program or Section	Diary	Meter	Passive	Average Repeat-Viewing (%)
GEC 1975, 1987	4 wks	NP	✓		✓	✓			55
HKR 1979		6,056	✓		✓	✓			48
BEG 1982	1 wk	18,000	✓		✓	✓			60
B 1986	2 wks	3,000	✓		✓	✓	✓		40
EW 1987	8 wks	650	✓		✓		✓		24
BE 1988	1 wk	375	✓		✓		✓		30
S 1988	4 wks	200	✓				✓		28
WW 1992	4 wks	3,222	✓				✓		40
BWW 1992	2 wks	2,365	✓			✓			+
Sh 1995		4,000	✓		✓		✓		35
HGT 1997			✓		✓				48
Z 1999	4 wks	3,400	✓		✓		✓		31
SBC 2009	12 wks x 2	NP	✓		✓		✓		36 34
DD 2012	8 wks	1,100	✓		✓		✓		38
Y 2008		1,385	✓				✓		22
CL 2022	4 wks	28,681	✓					✓	53
This article	*11 wks*	*46,116*		✓	✓			✓	*37*

✓ indicates "analyzed."

Time period: period over which repeat-viewing calculation was performed.

Sample size: number of individuals or households or "NP" not provided in the article.

Analysis level: television program or magazine content section.

Collection instrument: meter refers to Peoplemeter except for Barwise (1986) which used Audimeter data.

Findings: + correlations not average repeat-viewing %.

Authors: GEC 1975, 1987 – Goodhardt, Ehrenberg, and Collins; HKR 1979 – Headen, Klompmaker, and Rust; BEG 1982 – Barwise, Ehrenberg, and Goodhardt; B 1986 – Barwise; EW 1987 – Ehrenberg and Wakshlag; BE 1988 – Barwise and Ehrenberg; S 1988 – Soong; WW 1992 – Webster and Wang; BWW 1992 – Brosius, Wober, and Weimann; Sh 1995 – Sherman; HGT 1997 – Hoek, Gendall, and Turner; Z 1999 – Zubayr; SBC 2009 – Sharp, Beal, and Collins; DD 2012 – Danaher and Dagger; Y 2008 – Yao; CL 2022 – Choi and Lee.

Ehrenberg 1988; Goodhardt, Ehrenberg, and Collins 1975, 1987). Indeed, a takeout from Table 2 is that the average repeat-viewing rate never exceeds 60% and is mostly around 40%. This means that while overall audience sizes might be similar across TV episodes, the composition of the audience will vary.

These published studies provide benchmarks for subsequent analyses – of different TV stations/channels, genres/types, and programs/series – or, for magazines, the repeat-viewing of different titles, content sections, and even individual journalists/columnists. This extends to our own study of digital magazine viewing. As highlighted in the final line of Table 2, our study shifts the boundary to another medium, a subscriber-based sample, and passive data collection. As with reach and frequency, passive measurement of repeat-viewing using site-centric data is now a viable option. When collecting data, no longer is there a need for active audience participation. Moreover, all site usage is captured.

Of special interest is the study by Choi and Lee (2022) – their focus is the viewing of video-on-demand (VOD) TV programs on a streaming platform. The TV context provides continuity with earlier studies, but the platform is digital and therefore – like our study – passive data collection is enabled. Average repeat-viewing rates of VOD TV programs are noticeably higher than rates observed for most previous studies. Several factors could explain this: viewers must request programs, they can continue where their previous viewing stopped, and the programs typically maintain a strong storyline. Later, we revisit this investigation of VOD and discuss how it compares with findings from our case study.

The discussion here leads to our third research question: for a digital subscription magazine, where site-centric data are available, we ask:

RQ3: What are the repeat-viewing rates of magazine issues and content sections?

Content Section Shares, Viewing Frequency and Repeat-Viewing

Given our interest in content sections, a reasonable question is: how are these sections' shares of the magazine related to viewing frequency and repeat-viewing? The notion of Double Jeopardy (DJ) provides some clues (Ehrenberg, Goodhardt, and Barwise 1990). In a TV context, DJ is where more popular programs on a station are watched more frequently and have higher repeat-viewing rates than less popular programs, where "popularity" is defined behaviorally as higher share or attitudinally as higher ratings. Typically expressed as a "jeopardy," less popular programs not only have lower share and/or lower ratings, but those who view do so less frequently and with lower levels of repeat-viewing.

A DJ effect between program ratings and repeat-viewing rates was first highlighted by Barwise (1986). He found a positive relationship between ratings and repeat-viewing and proposed in his conclusion that the proliferation of channels would lead to lower repeat-viewing levels. Subsequently, many media studies have reported the DJ effect (*e.g.*, Barwise and Ehrenberg 1987, 1988; Beal 2003; Danaher and Dagger 2012; Donthu 1994; Ehrenberg, Uncles, and Goodhardt 2004; Goodhardt, Ehrenberg, and Collins 1987; McDowell and Dick 2001, 2005; Sharp, Beal, and Collins 2009; Zubayr 1999). DJ has been reported for TV and radio dayparts, as well as channels and programs, and seen across newspaper titles (*e.g.*, Webster and Wang 1992). Studies of digital platforms (Choi and Lee 2022; Taneja 2020) have also demonstrated that usage is aligned with share, as is expected from DJ, in which less popular sections, those with lower market shares, are viewed by fewer subscribers who view less frequently.

However, despite reasonably strong evidence for the effect, some TV studies have reported a lack of correlation between ratings and repeat-viewing, or they describe mixed results. For example, Ehrenberg and Wakshlag (1987) reported similar levels of viewing for high-rated and low-rated programs, and Yao (2008) showed DJ is evident for some dayparts but not all dayparts. A further study reported that across program categories, the DJ effect did not occur (Webster and Wang 1992). In addition, exceptions to DJ have been noted for specific content types, such as religious TV stations and ethnic minority TV.

Within a magazine context, less popular content sections might not only account for lower shares of the magazine, but those who view these sections might do so less frequently and with lower levels of repeat-viewing. This leads to our fourth research question:

RQ4: Do viewing frequency and repeat-viewing rates of content sections vary with these sections' shares of the magazine?

Heterogeneity in Repeat-Viewing

People are heterogeneous in their viewing behavior. This fact underpins the use of behavioral segmentation in media studies (Rossiter and Bellman 2005). Specifically, much attention has been given to possible differences between heavy and light users, and what these differences might mean for media planning reach patterns (from as long ago as Twedt 1964, to renewed commercial interest by Kerwin 2024).

Previous studies of traditional TV audiences have reported significantly higher levels of repeat-viewing for heavy users than light users. Goodhardt, Ehrenberg, and Collins (1987) reported a repeat-viewing rate of 55% for heavy viewers compared to 15% for light viewers. Two decades later, Sharp, Beal, and Collins (2009) reported 60% and 12%

respectively. Heavy users appear to view anything, even when it is only "the best of a bad bunch" of things to watch (Danaher and Dagger 2012, p. 232). Interestingly, light viewers also are not selective in their viewing – "they generally *do not* pick out only a few programs which they then watch very regularly" (Barwise, Ehrenberg, and Goodhardt 1982, p. 25, italics added).

In the digital era, with much greater flexibility in the way content can be selected, we ask whether the findings reported in previous studies still hold true:

RQ5: Is there heterogeneity in repeat-viewing rates of magazine issues and content sections?

RESEARCH METHOD

Approach

For digital media, server-log or clickstream files passively and automatically capture data on in-media behavior. Site-centric behavioral log data, sometimes referred to as trace data (Wu and Taneja 2021), "provide a means for improving the measurement of audience size and characteristics of media" and "accurate metrics of reach (unique visitors) and exposure frequency (repeat visits)" (Bucklin and Sismeiro 2003). With this in mind, we analyze individual-level server-log data from a digital subscription service to answer our five RQs.

Our use of site-centric data resolves many of the data and measurement issues noted in the Media and Audience Metrics section of the article; however, there remain some limitations. For instance, the measurement of audience exposure is complicated by the fact that viewing can be thorough and in-depth, or merely a superficial glance (Green 2014b). This is a complication that carries across from the print medium to the digital environment. "Digital reading … can be fleeting" (Green 2014a, p. 615), leading some to ask: "if an advertisement runs online and no one sees it, is it still an ad?" (Flosi, Fulgoni, and Vollman 2013). Also, necessarily, the focus is on viewer behavior, not attitudes, ratings or satisfaction.

Despite these limitations, granular data from digital subscription services can be used to describe individual-level media viewing behavior. This is analogous to data from syndicated-services, such as MRI-Simmons, which were previously discussed. Further, in addition to the exposure to a title captured in these subscription datasets, granular data can also describe content-based viewing behavior.

Data

The case study refers to the viewing of a general interest subscription magazine in the portfolio of a leading publisher of digital newspapers and magazines.[2] The magazine is internationally recognized, with a sizeable audience, is mostly subscriber-based, and was an early adopter of paywall systems to monetize its digital content. Subscriptions are for the magazine and the archive, with no bundling across the publisher's portfolio of brands. The dataset included individual-level server-log records for over 42,000 subscribers, with over 150,000 sessions on the digital magazine site, distributed over 11 consecutive issues. The magazine typically contains 15–19 different content sections, which appear in every issue or every few issues. For consistency and reporting purposes, we focus on the leading 11 sections covering areas such as news, sport, music and letters.

For RQ3 and RQ4, the observed repeat-viewing rate was directly calculated from the individual-level server-log data (Danaher and Dagger 2012; Zubayr 1999). Specifically, repeat-viewing of magazine issues is calculated as the proportion of issue j viewers who also view issue $j+1$ for each pair of consecutive pairs (*e.g.*, issues 1 and 2, issues 2 and 3, issues 3 and 4, etc.). By extension, repeat-viewing of content sections is the proportion of section k viewers (in an issue) who also view section k in issue $j+1$ for each pair of consecutive pairs (or for the next issue where section k appeared). From these calculations of repeat-viewing pairs, averages can be determined for the magazine and for each content section. An alternative would be an imputed approach that calculates the average repeat-viewing rate from a single frequency distribution for all issues/sections in a series, thereby assuming repeat-viewing is evenly distributed over time across issues/sections (*e.g.*, Goodhardt, Ehrenberg, and Collins 1975, 1987; Sharp, Beal, and Collins 2009).

Heavy and light viewers are defined based on the time spent viewing the magazine. Typically, viewers are divided into quintiles, and in consumer product studies the focus is on the heaviest 20% as they are responsible for a majority of sales (Romaniuk and Wight 2015; Sharp 2010; Twedt 1964). In our study, heavy viewers are subscribers in the highest quintile (following Danaher and Lawrie 1998) and light viewers are those in the lowest two quintiles (following Katz 1981; Taylor and Ceber 2010).

FINDINGS

Reach and Viewing Frequency of Magazine Issues and Content Sections

To answer RQ1, we note from Table 3 how reach grows across magazine issues. The first issue reached 21% of subscribers, growing to 34% across two issues, 46% across three issues, and so forth. Reach was 100% across all issues because only subscribers who viewed at least once over 11 issues were included in the analyzed dataset (conceivably, there were non-viewing subscribers, but these are believed to be uncommon and do not form part of our analysis).

Answering RQ2, the viewing frequency for each issue of the magazine is summarized in Table 4. The average number of viewers of an issue was 8,964, with an average viewing rate of 1.6 times.

Averages were reasonably similar across issues. An exception was the fourth issue in our dataset which had approximately 1,300 more viewers than the average issue, although the viewing rate was in line with the average.

The frequency of viewing magazine issues and content sections is shown in Table 5. Whilst average viewing rates are reasonably consistent from issue-to-issue (Table 3, final column), only 1% of viewers viewed all 11 issues (Table 4, first line). More than half of all viewers (52%) viewed just one issue. Most people are not frequent viewers of the magazine, despite having paid a subscription. A similar pattern of frequency of viewing is seen for each content section of the magazine: over two-thirds of viewers of a specific section (68%) view the section just once, and very few (< 1%) view the section in all 11 issues. Most people are not frequent and consistent viewers of a content section, regardless of the type of section (*e.g.*, whether the section is news, sport, music, letters and so forth).

Our observations in relation to RQ1 and RQ2 may surprise some people who might expect (or wish) many more viewers to view all issues and sections, but it turns out the findings are not unusual. What we find for the viewing of the digital magazine is similar to previous findings for quite different media (*e.g.*, for the viewing of multi-episode TV programs in an analog era where there were far fewer competing channels, as reported by Goodhardt, Ehrenberg, and Collins 1975, 1987).

Repeat-Viewing of Magazine Issues and Content Sections

In response to RQ3, we see the repeat-viewing rate for magazine issues range from 34% to 39%, with an average of 37% from issue-to-issue (Table 5, first line). We also see the repeat-viewing rate for content sections ranges from 31% to 36%, averaging 34% (Table 6, final line). These numbers show repeat-viewing of the magazine, and of content sections, to be reasonably consistent across issues. Furthermore, about one-third of all viewers consistently view the same content sections from issue-to-issue.

Once again, these findings may come as a surprise to those who expect repeat-viewing rates to be higher overall and less consistent

Most people are not frequent and consistent viewers of a content section.

issue-to-issue, but it turns out the numbers here are similar to those reported previously for very different media contexts (*e.g.*, a repeat-viewing rate of 38% was reported for TV programs by Danaher and Dagger 2012).

Content Section Shares, Viewing Frequency and Repeat-Viewing

To answer RQ4, we again note that viewing frequencies (Table 4) and repeat-viewing rates (Table 7) are reasonably consistent across content sections; for example, the largest share section, *Section A*, had a repeat-viewing rate of 31%, and the lowest reported section, *Section K*, had a repeat-viewing rate of 35%. This consistency across content sections is despite significant variation in the share of the magazine of these sections (which varies from 16% [*Sections A and B*] to 5% [*Sections J and K*]) (Table 5).

No DJ effect is evident: that is, we do not see a correlation between magazine shares and either viewing frequencies or repeat-viewing rates. As a check, additional investigation was undertaken by grouping sections with similar magazine shares and comparing the repeat-viewing rates (following Danaher and Dagger 2012). *Sections A* and *B* were defined as "High Share"; *Sections C*, *D*, and *E* were "Medium Share"; and *Sections F*, *G*, *H*, and *I* were "Low Share." This provided approximately 30% share per group. The results, in Table 6, show the repeat-viewing rate across magazine share groupings is consistent, and is not confounded by magazine share.

The finding here is inconsistent with many TV studies that show a DJ effect between repeat-viewing and program rating. Note, however, earlier discussion in the Media and Audience Metrics section explained that whilst evidence for the effect is reasonably strong, there are exceptions. Also, it should be kept in mind the measures in our study are behavioral not attitudinal, not ratings, not satisfaction – DJ may exist in relation to these other metrics.

Table 3 Reach and Reach Growth across Magazine Issues

Viewers (% of Total Subscribers Who Viewed at Least Once over 11 Issues)	Magazine Issues										
	1	2	3	4	5	6	7	8	9	10	11
Total	21	34	46	57	65	71	79	84	89	95	100
New	21	13	12	23	8	6	8	5	5	6	5
Existing	0	21	34	46	57	65	71	79	84	89	95

A general theme is that expectations should be adjusted – *downwards*.

Heterogeneity in Repeat-Viewing of Magazine Issues and Content Sections

RQ5 refers to the repeat-viewing rates of heavy and light viewers. Heavy viewers are defined as those in the top 20% of time spent viewing the magazine, and light viewers are in the lowest 40%. Findings are presented in Tables 8 and 9 respectively.

Table 4 Viewing and Viewing Frequency across Magazine Issues

Magazine Issue	Number of Views	Number of Viewers	Average Viewing Rate
1	13,929	9,129	1.53
2	14,352	8,924	1.61
3	14,568	9,379	1.55
4	16,126	10,263	1.57
5	14,156	8,682	1.63
6	13,166	8,376	1.57
7	15,390	9,385	1.64
8	12,935	8,074	1.60
9	13,444	8,459	1.59
10	14,670	9,223	1.59
11	15,611	8,715	1.79
Mean	*14,395*	*8,964*	*1.61*

Repeat-viewing rates amongst heavier magazine viewers are 60% on average (Table 8, first row). As seen from the full dataset (Table 6), the size of the repeat-viewing audience is quite consistent issue-to-issue, with rates ranging from 54% to 64%, and broadly the same rates are observed for individual content sections.

Repeat-viewing rates for light magazine viewers are 12% on average (Table 9, first row). Again, as with the full dataset (Table 6), the size of the repeat-viewing audience is quite consistent issue-to-issue, with rates ranging from 8% to 14%, and broadly the same rates are observed for individual content sections. Any lack of consistency is likely to be statistical, not substantive, because the underlying absolute numbers are necessarily smaller for light viewers than heavy viewers.

As seen with the full dataset, the repeat-viewing rate did not decline with lower shares of the magazine, which might have been expected from the DJ effect. This is apparent in the separate analyses of heavy and light viewers (Tables 7 and 8), and from comparative analysis (Table 10).

DISCUSSION

Findings from our case study are summarized in Table 11. A general theme is that expectations should be adjusted – *downwards*. The reach of a single magazine issue appears to be quite low. Viewing frequencies are consistently low. Repeat-viewing rates are also low – no more than 37% of those viewing an issue will view the next. Over an extended observation period, hardly anyone – no more than 1% – will view every issue. Similarly, viewing frequencies of content sections are low, as are the associated

Table 5 Viewing Frequency of Magazine Issues and Content Sections

Magazine & Sections	n	Number of Magazine Issues Viewed (% of All Viewers over 11 Issues)										
		1	2	3	4	5	6	7	8	9	10	11
Magazine	42,165	52	21	10	5	3	2	2	1	1	1	1
Section A	19,540	66	16	6	3	2	1	1	1	1	1	1
Section B	19,048	64	16	7	4	2	2	1	1	1	1	1
Section C	14,759	68	15	6	3	2	2	1	1	1	1	–
Section D	11,176	66	14	6	3	2	2	1	1	1	1	1
Section E	10,948	65	14	6	4	2	2	2	1	1	1	1
Section F	13,504	73	14	6	3	2	–	–	–	–	–	–
Section G	9,559	69	14	6	3	2	2	1	1	–	–	–
Section H	9,555	73	14	6	4	3	–	–	–	–	–	–
Section I	8,495	68	14	6	4	2	2	2	2	–	–	–
Section J	8,989	70	14	6	3	2	2	2	–	–	–	–
Section K	6,959	69	14	6	4	3	2	2	–	–	–	–
Sectional Average		*68*	*14*	*6*	*3*	*2*	*2*	*1*	*1*	*1*	*1*	*1*

Table 6 Repeat-Viewing of Magazine Issues and Content Sections

Magazine & Sections	MS	Issues (Repeat-Viewing Rate, %)											
		1	2	3	4	5	6	7	8	9	10	11	Avg
Magazine		38	38	39	38	34	38	39	34	39	39	35	*37*
Section A	16	34	28	32	28	30	29	33	32	34	34	31	*31*
Section B	16	34	28	33	30	32	30	34	34	42	46	28	*32*
Section C	12		37	34	31	27	36		26	30	35	34	*32*
Section D	9	36	39	34	37	36	40	34	40	39	41	41	*38*
Section E	9	40	35	30	38	32	37	32	36	34	35	37	*35*
Section F	9			35	31	35	19	34					*31*
Section G	7			26		34	43	23	40		28	32	*32*
Section H	6		36	28	30	40							*33*
Section I	6		39	34	30	32			30		36	40	*34*
Section J	5		28	37	24	37			31	32			*32*
Section K	5					33	41	27	39		32	35	*35*
Sectional Average		*36*	*34*	*32*	*31*	*33*	*34*	*31*	*34*	*35*	*36*	*35*	*34*

MS – magazine share; Avg – average across magazine issues.

Empty cells exist because not all content sections appear in all issues of the magazine.

Table 7 Repeat-Viewing Rates and Magazine Shares

Section Groupings (by MS)	Issues (Repeat-Viewing Rate, %)											
	1	2	3	4	5	6	7	8	9	10	11	Avg
High	34	29	33	29	32	29	34	33	32	36	29	*32*
Medium	37	34	30	28	33	26	36	31	34	34	34	*32*
Low	33	30	33	21	32	31	31	21	27	42	30	*30*

MS – magazine share; Avg – average.

Table 8 Repeat-Viewing of Magazine Issues and Content Sections: Heavy Viewers

Magazine & Sections	Issues (Repeat-Viewing Rate, %)											
	1	2	3	4	5	6	7	8	9	10	11	Avg
Magazine	63	61	64	55	62	54	62	56	61	62	64	*60*
Section A	53	48	54	42	54	43	55	49	51	53	59	*51*
Section B	52	46	54	42	55	44	53	50	48	55	54	*50*
Section C		56	50	47	41	56		37	46	50	49	*48*
Section D	52	54	49	50	52	50	48	51	53	53	66	*53*
Section E	55	50	44	52	50	49	46	49	49	50	57	*50*
Section F		54	49	48	39	57						*48*
Section G		50	41	45	59							*49*
Section H			43		46	54	38	54		44	52	*47*
Section I	55	51	46	47			45		48	54		*49*
Section J		47	54	42	50			46	47			*48*
Section K					42	51	40	49		44	56	*47*
Sectional Average	*53*	*51*	*48*	*46*	*49*	*51*	*46*	*48*	*49*	*50*	*56*	*50*

Table 9 Repeat-Viewing of Magazine Issues and Content Sections: Light Viewers

Magazine & Sections	Issues (Repeat-Viewing Rate, %)											
	1	2	3	4	5	6	7	8	9	10	11	*Avg*
Magazine	12	13	10	13	10	14	12	11	12	12	8	*12*
Section A	4	3	0	2	2	2	1	1	3	3	1	*2*
Section B	2	2	0	0	1	0	1	0	2	2	0	*1*
Section C		0	3	1	1	1		0	0	3	1	*1*
Section D	0	0	0	3	2	3	0	0	2	2	0	*1*
Section E		1	0	1	1	1						*1*
Section F	2	5	4	5	1	4	2	4	6	2	2	*3*
Section G		0	0	0	1							*0*
Section H			0		7	2	0	0		1	0	*2*
Section I	1	2	2	2			1		2	1		*1*
Section J		1	2	0	4			2	1			*2*
Section K					0	0	0	0		0	0	*0*
Sectional Average	*2*	*2*	*1*	*2*	*2*	*2*	*1*	*1*	*2*	*2*	*1*	*1*

Table 10 Comparison of Magazine Issues and Average Content Section Repeat-Viewing Rates Across Readers

Heavy & Light Users	Issues (Repeat-Viewing Rate, %)											
	1	2	3	4	5	6	7	8	9	10	11	*Avg*
Magazine												
All	38	38	39	38	34	38	39	34	39	39	35	*37*
Heavy	63	61	64	55	62	54	62	56	61	62	64	*60*
Light	12	13	10	13	10	14	12	11	12	12	8	*12*
Average content section												
All	36	34	32	31	33	34	31	34	36	36	35	*34*
Heavy	53	51	48	46	49	51	46	48	49	50	56	*50*
Light	2	2	1	2	2	2	1	1	2	2	1	*1*

Avg – average across magazine issues.

repeat-viewing rates. By extension, the reach and frequency of an advertisement placed in a magazine is likely to be low, and no more than one-third of viewers of an issue are likely to see similar advertising in the next issue.

Some of these findings may be surprising, especially to those who have previously relied on gross circulation and distribution metrics, or subscriber numbers. But our conclusions with reference to precise media audience metrics are similar to those from prior studies. See, for example, the data reported in the final column of Table 2. This is despite most prior studies being concerned with traditional free-to-air TV, not subscription-based magazines or digital services.

One exception among prior studies is the analysis by Choi and Lee (2022) of VOD TV programs – they report an average repeat-viewing rate of 53% (compared to 37% in our study). A possible technical reason for the difference is that programs needed to meet a threshold of 30 viewers per week to be included in their 4-week study. A more substantive explanation is that repeat-viewing rates differ depending whether a person pays for a specific program on demand (Choi and Lee's study) or pays an upfront subscription for a magazine format (our study). Those in the latter group may simply set-and-forget their digital magazine subscription.

A DJ effect was anticipated – whereby viewing frequency and repeat-viewing rates decline with magazine share. However, this was not observed. The absence of DJ is inconsistent with many prior studies, but not all (*e.g.*, Ehrenberg and Wakshlag 1987; Webster and Wang 1992). Note, here only behavioral data are

Table 11 Summary of Research Questions and Findings

Research Question	Findings
RQ1: What is the reach of magazine issues and content sections?	Magazine reach varies from issue-to-issue. It is as high as 23% for issue four, and as low as 5% for issues 8, 9 and 11. Circulation and subscriber numbers are likely to be poor approximations for issue-by-issue reach, content section reach, and advertising audience reach.
RQ2: What is the viewing frequency of magazine issues and content sections?	Of those who viewed the magazine at least once over 11 issues, 52% viewed just one issue and only 1% viewed all 11 issues. Even for a subscription service, most people are infrequent viewers of the magazine and of the content sections within. By extension, most people will be infrequent viewers of advertisements in the magazine and content sections.
RQ3: What are the repeat-viewing rates of magazine issues and content sections?	On average, repeat-viewing is 37% for the magazine (from one issue to the next) and 34% for content sections (from one issue to the next). These percentages are similar to those observed for other media, but lower than some people might have assumed. The numbers mean that only one-third of viewers from one issue might view similar content, or similar advertising, in the next issue.
RQ4: Do viewing frequency and repeat-viewing rates vary with these sections' shares of the magazine?	Repeat-viewing rates of content sections do not vary in line with these sections' shares of the magazine, despite variation in the shares from a high of 16% (Section A) to a low of 5% (for each of Sections J and K). At least in terms of the behavioral metrics analyzed in this article, the DJ effect is not observed.
RQ5: Is there heterogeneity in repeat-viewing rates of magazine issues and content sections?	Repeat-viewing rates differ between heavy and light viewers. Compared to the magazine average of 37% (RQ3), only 12% of light viewers repeat-viewed, whereas 60% of heavy viewers repeat-viewed. These rates of repeat-viewing are in line with findings from previous media studies and highlight the importance of heavy viewers for both magazine publishers and advertisers. The content section average is 34% (RQ3), with only 1% of light viewers repeat-viewing, and 50% of heavy-viewers repeat-viewing.

Table 12 Comparison of Repeat-Viewing Rates in This Article with Previous Studies

	Repeat-Viewing Rates (%)			
Study	Average	Light	Medium	Heavy
BEG 1982		30		70
GEC 1987	60	15	30	55
SBC 2009	35	12	28	60
This article	*37*	*12*		*60*

Authors: BEG 1982 – Barwise, Ehrenberg and Goodhardt; GEC 1987 – Goodhardt, Ehrenberg and Collins; SBC 2009 – Sharp, Beal and Collins.

analyzed, therefore there still might be a DJ relationship between attitudinal ratings and magazine share. That is a question for future research.

Heterogeneity is evident, with significant differences in repeat-viewing by heavy and light viewers: magazine averages are 60% and 12% respectively. A comparison with findings from prior studies shows that repeat-viewing rates of heavy/light viewers in our case study are consistent with those reported previously (Table 12). This is despite the shift in focus from traditional TV to a digital magazine. Given the ease of digital access, and subscription service, it might have been expected that repeat-viewing rates would be higher.

The importance of heavy viewers to both magazine publishers and advertisers is apparent. But, at the other end of the spectrum, many viewers show low viewing frequencies and low levels of repeat-viewing, both of which could impact the effectiveness and efficiency of any advertising campaign that relies on magazine media. The fact this is true for subscription-based digital services may be concerning for media publishers who have come to rely on these services for a greater proportion of their revenue (WARC Best Practice 2022b). The problem is that the large number of light-viewing subscribers may reflect set-and-forget behavior or perceived lack of value, both of which could increase the risk of defection or non-renewal. However, whilst the risks are real, low repeat-viewing rates by large numbers of light viewers are reported for other media – there appears to be no unique problem facing subscription-based digital services.

CONCLUSION

Investigated is the viewing of a digital subscription magazine, such as that provided by the *Wall Street Journal* or *New Yorker*. In this final section, we describe practical and technical conclusions from our case study and mention some broader themes that deserve further investigation.

For practical purposes, we have shown the value of using granular industry data and direct metrics to understand the viewing of digital magazines and content sections by subscribers. This passively and routinely collected data can provide important behavioral insights, both to help engage and retain magazine subscribers, and inform conversations with media planners and advertisers.

Media planners gain more accurate information about the way magazines, and the contents and advertisements, are viewed. With

granular data they can calculate the actual audience size exposed to a campaign and come closer to saying whether a campaign will achieve effective reach and effective viewing frequency. This means they can shift away from using circulation rates, or other proxy metrics, to infer opportunities-to-see. Nor need they rely on subscriber numbers – that is important when so many subscribers *do not* view every issue, *do not* view all sections of an issue, and *do not* view a specific section across all issues.

Our analysis offers media planners and advertisers guidance for the placement of advertising to achieve media objectives. For reach objectives, placement will be in widely read content sections, whereas for frequency objectives the focus is sections with higher repeat-viewing. And the low repeat-viewing rates suggest an advertiser is better to advertise across issues rather than place multiple advertisements in a single issue. The analysis also informs placement expectations (*e.g.*, are the reach, viewing frequency and repeat-viewing objectives reasonable, given the way content sections are actually read?). These insights from granular-level data can assist in specifying media plans, informing expectations, and ultimately assessing whether objectives are met.

For advertisers, given the importance of content relevance, the insight that average repeat-viewing rates do not greatly vary across content sections with varying magazine shares can assist contextual advertising placement. However, the findings also reveal issue-to-issue individual variation underlying the averages. Despite reasonably constant subscriber-base and circulation figures across issues – and despite the finding that average repeat-viewing rates do not greatly vary – the individuals who view specific magazine issues, content sections and advertisements will differ. This needs to be factored into media plans – for example, by placing advertising in more issues and in more appropriate contexts.

At a technical level, site-centric data prove to be invaluable for granular analysis; sampling concerns are avoided because such data are essentially a census of behavior, collected passively. This negates the challenge of recruiting or retaining panelists, or ensuring the panelists are representative of the magazine audience. For every subscriber the digital footprint is known (Madden et al. 2007), enabling the analysis of exposure to each issue and the content within every issue. The analysis undertaken in this article also indicates how media aggregators might promote their site-centric data to advertisers (Taneja and Mamoria 2012).

In terms of research priorities, the article addresses two. First, Campbell's call (2023) to recheck assumptions and models is considered by evaluating audience behavior in the digital environment. Analysis of the granular data reveals distinct patterns of viewing in relation to reach, viewing frequency and repeat-viewing, mostly in line with previous TV studies (although not with respect to the DJ effect). Media aggregators, planners and advertisers can make use of established findings as benchmarks when analyzing fresh data for the magazine of interest, or other titles in the publisher's portfolio, or titles in other publishers' portfolios. Such findings and benchmarks can be incorporated into dashboards for data-driven decision-support (Chan and Uncles 2022).

Second, this article begins to address the call by Campbell (2023) for further understanding of attention to advertisements. The analysis of granular data should offer improvements over traditional indirect, proxy, metrics. However, this is not to say the challenge of securing and deepening the attention of subscribers is resolved – especially when there is so much competition for their eyeballs from other digital subscription services, from non-subscription services, and from social media. Other important considerations when it comes to attention include the wider media context (*e.g.*, the effectiveness of cross-platform optimization when an advertisement in a digital magazine is just one element of a broader campaign across multiple media) and the advertisement itself (notably, the persuasiveness of the message and the weight given to the most persuasive message executions) (Findley et al. 2020).

For the future, we not only encourage further studies of digital magazines, but also investigation of how other subscription-based digital services are viewed (*e.g.*, music and video streaming services such as *Spotify* and *Disney+*, and online newspapers and podcasts like *USA Today* and *The Joe Rogan Experience*). As noted in the Introduction, the outlook for advertisers using these services is decidedly mixed, but in at least in one respect there is upside: namely, the access that media and advertising managers now have to granular industry data and therefore the ability to derive precise metrics of audience viewing behavior.JAR

NOTES

1. For simplicity, throughout the paper we refer to "viewers" as shorthand for "viewers or readers".
2. To preserve confidentiality, the magazine title cannot be disclosed, and because of privacy concerns, subscriber demographics were not available to the researchers. Analysis was confined to the digital subscription service. In principle, digital magazine viewers might be able to obtain and read printed copies.

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