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5 The Technologies of Counting

The need for industry cooperation seems more important than ever as online video is becoming a larger source of revenue. Hulu recently brought attention to the problems with online measurement when they publicly criticized Nielsen for under-counting its audience: In the month of March, ComScore counted 42 million Hulu viewers while Nielsen only reported 9 million. In a business based on CPM, a difference of 33 million viewers is unacceptable, even if online viewing only makes up a fraction of television revenue. Further, large-scale projects like television Everywhere will most likely complicate audience measurement even further as publishers and MSO's make television subscription content available on multiple screens with authenticated protocols ... The data is there and it's abundant, but the industry needs to create standards and protocol to measure the quality of that data if they expect to use it as a workable basis for negotiation. Sheila Seles (Seles 2009)

SanCom's patented solution combines powerful biometric authentication and efficient neural network processing to produce the only television Rating product that enables passive gathering of the following seemingly simple but highly elusive viewer data: (a) who is actually present in the television viewing area (b) who enters and exits the viewing area, and exactly when (c) what channels are being watched (not just tuned) and at what time (d) who changes the channel (e) who turns the television on and off and (f) the presence of a guest (an unrecognized person) in the viewing area. SanCom's hypersonic facial recognition technology (<http://www.sancominc.com>)

There has been an explosion of types of measurement. SanCom's promise is that its hypersonic facial recognition system will solve problems associated with exposure, showing, with reduced error, what people do. Self-report, like people filling out diaries, has often been seen as a more error-prone way of collecting ratings data compared with physical technologies that can remove the human element altogether. As Sheila Seles points out in her blog comment, however, the primary problem is not one of measurement but one of agreement, the topic of this book. Yet this does not make technology unimportant.

This chapter places the technologies of counting within the highly charged innovation system that is the broadcast ratings. While there has always been significant public debate about the methods of data collection and their relative merits – whether meters, diaries, the face-to-face interviews, telephone incidentals or aided recall – the contemporary politicization of the ‘technologies of peplemeter counting’ has brought with it new and previously unprecedented attention from new places and new people. This makes all the more necessary careful attention to and exploration of the ratings innovation system. In this chapter we will look at how the methods of data collection and their associated technologies are changing. Particular technologies of counting have emerged and been deployed (and in some cases redeployed) to meet both contingent circumstances of listening and viewing and to address different market contexts. It will be also shown how changes in the contexts of listening and viewing directly lead to the adoption of some instruments or technologies over others; how technological advances in both the household (the receiving context) and the ‘production’ context influence the form, direction, presentation and timeliness of data collection and its analysis; and how what can be expected of respondents enters into the very organization of data collection. The combination of collection friendliness and cost effectiveness has been crucial in the adoption of particular methods of data collection.

The Diffusion of Ratings Technology

Television ratings services are now rapidly diffusing worldwide. Russia and the former Eastern Bloc countries also have syndicated ratings, although these ratings do not necessarily have full coverage of television homes. Most of Africa does not have a syndicated ratings presence. Customized studies, by companies like Telmar, tend to cover those countries with emerging markets but no ratings. Keep in mind, however, that many African countries have major problems with basic infrastructure, making radio the major medium in rural areas in particular.

Table 5.1 shows when Peplemeters were first rolled out in some of the established countries (excepting more recent Asian countries). Most panels collect data on individuals, timeshifting and guests to the home. The organizations in charge of ratings, however, can vary in structure, from joint collaborative industry committees, such as BARB in the United Kingdom, through to independent ratings company ownership of ratings, such as Nielsen in the United States.

The US Nielsen television ratings obtain data from a statistically selected sample of over 9,000 households, containing over 18,000 people. Nielsen also measures 210 local television markets in what it calls designated market areas (DMAs). The 56 largest of these DMAs are measured by Peplemeter technology. Twenty-five are measured by Local People Meters. The remaining areas are measured by paper

Table 5.1 Establishment of Peplemeter panels by country

Country	TV Homes (Million)	Start-up Organization	Meter Start Date
Australia	3.7	ACNielsen	1991
Austria	3.7	AGTT/GfK Austria	1991
Belgium	4.7	Audimétrie	1985
Bulgaria	2.6	TV Plan/TNS	1999
China	7.0	ACNielsen	1996
Croatia	1.4	AGB Nielsen Media Research	2002
Cyprus	0.3	AGB Nielsen Media Research	1998
Czech Republic	3.7	Mediaresearch	1997
Denmark	2.4	TNS Gallup	1992
Estonia	0.6	TNS Emor	2003
Finland	2.2	TV Mittaritutkimus/Finnpanel	1987
France	25.0	TRCC Médiamétrie	1989
Germany	33.9	AGF/GfK Fernsehforschung	1985
Greece	3.4	AGB	1988
Hungary	3.9	TNS	1994
Indonesia	7.34	ACNielsen	1998
Ireland	1.5	AGB Nielsen Research	1996
Italy	22.6	Auditel – AGB Italia	1986
India	135	TAM Media Research	1998
Japan	50.8	iNEX2/Videoresearch	1997
Latvia	0.8	TNS Latvia	1999
Lithuania	1.3	TNS Gallup	2000
Malaysia	3.1	ACNielsen	1995
Netherlands	7.1	Intomart/TV Times	1987
New Zealand	1.1	AGB McNair	1990
Norway	2.0	TNS Gallup	1992
Philippines	1.5	SRG	1994
Poland	13.4	AGB Polska	1996
Portugal	3.5	Marktest Audimetria	1993
Romania	6.9	AGB-TNS International	1998
Russia	50.0	TNS Gallup Media	1996
Serbia	2.4	AGB Nielsen Media Research	2002
Slovakia	1.6	TNS	2004
Slovenia	0.7	AGB Nielsen Media Research	1999

Continued

Table 5.1 Continued

Singapore	0.9	ACNielsen	1994
South Korea	2.8	MSK	1992
Spain	15.7	TNS	1988
Sweden	4.1	AGB Nielsen Media Research	1993
Switzerland	3.1	IHA-GfK Hergiswil	1985
Taiwan	5.4	ACNielsen	1994
Thailand	20.3	SRG Deemar	1990
Turkey	15.9	AGB	1990
Ukraine	16.5	GfK Ukraine (GfK-USM)	1998
UK	25.2	BARB/Ipsos RSL/RSMB/AGB	1981
USA	89.1	ACNielsen	1987

diaries. In 19 local markets Nielsen measures Hispanic audiences. In 14 of these markets diaries are used; in one market Nielsen uses meters and diaries and in four markets Local People Meters are used for measurement. Nielsen uses a special National Hispanic People Meter sample of 1,000 Hispanic households to represent the whole US Hispanic population. As discussed in the previous chapter, the change in counting technology in the transition from the Audimeter/diary system to the Local People Meter has not been without controversy, although in July 2010, the Media Ratings Council accredited all Nielsen's LPM systems in 25 markets.

In order to graphically compare television and radio ratings markets and the location of meters or diaries in a country with a geographically dispersed population, like the United States, with another, albeit one with a population less than one-tenth the size of the United States, it is worthwhile looking at Australia. OzTAM, owned by the three major free-to-air broadcasters, has appointed Nielsen to collect the television ratings data. Nielsen collects the radio metropolitan data on behalf of Commercial Radio Australia (CRA) and regional radio ratings data on an ad hoc commissioned basis. Households are recruited to OzTAM's panel from a large scale Establishment Survey that, based on the Census, defines the population to be represented and its characteristics. In 2009, there was a panel for each one of the 5 metropolitan markets, comprising a total of 3,035 homes (Sydney 765, Melbourne 705, Brisbane 615, Adelaide 475 and Perth 475). Figure 5.1 shows the distribution of meters. There is also a panel for the national subscription television market comprised of 1,200 subscription television homes drawn from the metropolitan and regional TAM services. Figure 5.2 shows the distribution of meters for this service.

The meter in the home records and stores all broadcast viewing: the time, date, whether the television set is on/off and the channel to which each television set

Figure 5.1 Television meters for the metropolitan market in Australia

is tuned. All residents and guests register their television usage using a remote control. The meter is connected to the telephone network and every night data is automatically and silently retrieved via the meter's internal modem. The production system performs the collection, processing, validation, weighting and final production of each household's data. Once the production processes have been completed, the television programme information and ratings are integrated. All data undergoes rigorous quality control both electronically and manually. All results are released the following morning and the data is made available to subscribers via a secure website.

The social stratification variables used by OzTAM below are no longer the A,B,C,D,E classifications of the past but, despite being called Occupation Groups, serve the same purpose as McNair and Anderson categories:

Occupation Group 1 (OG1): Managers, Administrators and Professionals

Legislators and Government Appointed Officials; General Managers; Specialist Managers; Farmers and Farm Managers; Managing Supervisors (Sales and

Figure 5.2 Television meters for National Subscription Panel

Service and Other Business); Natural Scientists; Building Professionals and Engineers; Health Diagnosis and Treatment Practitioners; Tertiary Teachers; Social Professionals; Business Professionals; Artists and Related Professionals.

Occupation Group 2 (OG2): Para-Professionals, Clerks, Teachers, Salespeople and Professional Service Workers

Medical and Science Technical Officers and Technicians; Engineering and Building Associates and Technicians; Air and Sea Transport Technical Workers; Registered Nurses; Stenographers and Typists; Data Processing and Business Machine Operators; Numerical Clerks; Filing, Sorting and Copying Clerks; Material Recording and Despatching Clerks; Receptionists; Telephonists and Messengers; School Teachers; Investment, Insurance and Real Estate Salespersons; Sales Representatives; Sales Assistants; Tellers; Cashiers and Ticket Salespersons; Personal Service Workers.

Occupation Group 3 (OG3): Tradespersons

Metal and Machinery Tradespersons; Electrical and Electronics Tradespersons; Building Tradespersons; Printing Tradespersons; Vehicle Tradespersons; Food Tradespersons; Amenity Horticultural Tradespersons.

Occupation Group 4 (OG4): Plant and Machine Operators, Drivers and Police

Road and Rail Transport Drivers; Mobile Plant Operators; Stationary Plant Operators; Machine Operators; Police.

Occupation Group 5 (OG5): Labourers and Related Workers

Trade Assistants and Factory Hands; Agricultural Labourers and Related Workers; Cleaners; Construction and Mining Labourers.

OzTAM can break down the audience by gender, income and a range of other variables. Table 5.2 below is an example of some of the breakdown as of 2009:

Table 5.2 OzTAM audience breakdown

Total Individuals		3,698	100.0%
Working 16+		1,720	46.5%
Not Working 16+		1,175	31.8%
Total Households		1,221	100.0%
1 Person Households		152	12.5%
2 Person Households		438	35.9%
3 Person Households		226	18.5%
4 Person Households		252	20.6%
5+ Person Households		154	12.6%
Grocery Buyers	18–39	366	30.0%
Grocery Buyers	18–54	804	65.8%
Grocery Buyers Age	25–54	765	62.7%
Grocery Buyers Age	40–54	438	35.8%
Grocery Buyers Age	55–64	227	18.6%
Grocery Buyers Age	65+	190	15.6%
1 television Households		239	19.6%
2 televisions Households		437	35.8%
3+ televisions Households		545	44.6%
Grocery Buyers		1,221	100.0%
Grocery Buyers Working		682	55.9%
Grocery Buyers Not Working		539	44.1%

In analysing audience ratings, as should have become clear in the chapter on sampling, the more the sample is broken down to analyse smaller groups, the more the sampling error changes. The samples for radio, as a result, are larger than those for the television panel. Australia has over 260 commercial radio stations. In metropolitan and major regional surveyed markets there are 53 commercial stations and all of these stations are included in the radio ratings sweeps. The balance of commercial stations is surveyed from time to time but not on a regular scheduled basis. Table 5.3 provides an overview of the radio ratings samples in 2006.

One of the obvious benefits of ratings is the same benefit that Silvey sought in his BBC research: an idea of when people used the medium. Australia, however, is experiencing, along with the United Kingdom, the United States, Canada and others, a decline in television free-to-air network audience share. Figure 5.3 shows the dramatic drop in share between 2000 and 2006 in the Canadian market.

Table 5.3 Australian radio diaries

Metropolitan Markets (53,904)
– Perth 8,829
– Adelaide 8,281
– Melbourne 11,895
– Sydney 11,454
– Brisbane 9,879
Regional Markets (15,557)

Figure 5.3 Canada's declining network audience

The decline in network viewing has had a corresponding effect on advertising and subscription television revenue, which today exceeds traditional advertising revenue in the broadcast markets of the United Kingdom and the United States. Advertising revenue has also shifted towards below-the-line advertising techniques, like direct selling.

Proliferation of Channels and Measurement

The type of measurement promised by SanCom at the start of this chapter – to closely monitor viewers’ biometrics, or to capture data on who is watching and how engaged they are without relying on viewers reporting their presence by pressing a button or punching in a code – has been around for many years. It always flounders on the difficulty of recruiting a representative panel willing to be watched in this way. The evolution of set-top boxes has led to the development of technologies that can count and monitor viewing in ways that are less obvious and much less objectionable to viewers. They can also capture information on a scale not previously possible. The availability of these technologies led to changes in ratings measurement, as Alan Wurtzel, head of research at American network NBC, observed in 2009:

A couple of years ago, Nielsen delivered a single television-rating data stream. Today, Nielsen routinely delivers more than two dozen streams (yes, we counted them) and countless more are available for any client willing to pull the data. Moreover, set-top boxes (STB), moving closer and closer to second-by-second data, will produce a staggering amount of new information. And, with internet and mobile metrics as well, it’s not the amount of data that is the problem; it’s the quality and utility. (Wurtzel 2009: 263)

Digital set-top boxes can now routinely gather and report enormous amounts of information from subscribers. However, few common standards exist, and proprietary systems dominate. An independent report commissioned by the Nielsen-funded Council for Research Excellence in February 2010 described the set-top box as the “wild west” of research’ and raised concerns about the potentially unethical motives of some of the developers, about the lack of standard practices in the field and about the ‘veil of secrecy surrounding set-top box data processing’ (Brooks, Gray and Dennison 2010: 9). With the billions of dollars that ride on ratings data, and with the value of the data collected via set-top boxes for quantifying, monetizing and targeting the audience, it is highly likely that some of the key issues – inconsistent data formats creating difficulties in cross-referencing data across systems and different methods used to determine when the television is in use, for example – will be resolved, and the set-top box frontier will be tamed.

This frontier is increasingly being populated as these boxes rapidly become normal television interfaces. And the prospects, in terms of the size of the population whose preference data can be collated and distilled, are enormous. In November 2009, TiVo agreed to provide data from its 1.6 million direct subscribers in the United States to Google, which already had secured access to data from the four million subscribers to the dish satellite service to help develop Google's television ads service. This large survey group complements the data Google derives from Nielsen's panel under the terms of a 2007 deal. Unlike panellists or diarists for Nielsen, BARB or OzTAM, TiVo subscribers are not constantly reminded that information is being collected about their viewing habits. Subscribers are largely unaware of the value of their information, or of how much information they continue to provide after they initially 'opt in', agreeing to provide certain data when the contract of service was signed or accepted with a click. Viewers consent to provide feedback, whereupon tags are attached to the return path data – viewing choices and other information – for sorting and aggregating. The tagging system is proprietary, and not subject to an industry standard. Although TiVo makes clear that viewers must specifically 'opt-in' to provide 'Personally Identifiable Viewing Information', that information must be provided to access certain features of the TiVo service. This data is then compiled and provided to TiVo's many research partners including TRA (The Right Audience).

While small panel-based research projects like the BBC's 650 panellist Cross Media Insight survey are still very much part of the landscape, the advent of the digital set-top box has allowed the numbers of participants in such studies to be dwarfed by census-level data from surveys of millions of subscribers. Frances Bonner calculated that television requires something like 250,000 ordinary people each year as contestants, interviewees and audiences (Bonner 2003). The number and variety of ordinary people providing feedback to research organizations and market researchers is many times more than this, and still the audience remains the key uncertainty affecting the economics of the media industries (Napoli 2003: 39). Napoli argues that this fragmentation increases the disparity between the predicted and the measured audience and reduces the reliability of data collected in traditional sample-based methods (Napoli 2003: 140). It certainly increases the 'research ask', and complicates the carefully calibrated equations that produce the ratings from smaller panels. While mass audiences can still be assured for certain major events, often live international sports championships, audiences in general have dispersed. Content providers, advertisers and research organizations have had to track not only timeshifting and 'catch-up television', but also migration across platforms, and even beyond the home. Audience fragmentation has precipitated proliferations of data, methods, metrics and technologies that in turn have allowed samples of a few hundred in panels or diaries to multiply into surveys of millions

of subscribers and produce competing currencies. Opportunities for advertisers to reach consumers through media and other touchpoints have proliferated, while advertisers' and content providers' desire for solid numbers and discontent with the prevailing currency and methods have opened spaces for research and analysis.

Expenditure on media advertising has been volatile around the world since the onset of the global financial crisis. And whereas in the past, changes in methods or technologies of audience measurement were often stimulated by advertisers, now advertisers like research agencies find themselves in a position of reacting and responding to a rapidly changing and uncertain audience marketplace. In an effort to provide the kind of holistic measurement that advertisers and media buyers demand, services combining media measurement databases have been developed, such as Nielsen's Anytime Anywhere Media Measurement or A2/M2 service in the United States, or the IPA's Touchpoints Initiative in the United Kingdom, modelled on the BBC's Daily Life Survey that has been conducted periodically since the 1930s.

For Touchpoints, 5,000 initial panellists, rising to 6,050 by the third survey, were given self-completion questionnaires and asked to complete an e-diary via PDA to document media use over seven days at half hourly intervals. The panellists (all adults, from across the United Kingdom) are paid a 'respondent incentive' of £20–£25. Touchpoints has to date conducted three six-month surveys, each by different research contractors, in April–November 2005, September 2007–February 2008 and September 2009–February 2010. With at least £300,000 in respondent incentives alone, this is clearly an enormously expensive exercise, and one that requires considerable cooperation and input from across the media industries. As efforts intensify to determine a new currency and new standards, Touchpoints-like initiatives are being rolled out in other countries, including the United States. The information the survey supplies supplements BARB's measurements drawn from its 5,100 panellists, and from the National Readership Survey for newspapers and magazines, the Joint Industry Committee for Regional Media Research (JICREG)'s interviews and website measurement for regional newspapers, RAJAR's diaries for radio, Poster Audience Research (Postar)'s estimates of out-of-home advertising, and Film Audience Measurement and Evaluation (FAME)'s cinema interviews.

In the United States, NBC Universal used the Summer Olympics of 2008 and Winter Olympics of 2010 to conduct large-scale research on online, mobile and television viewing and to track advertising recall across media. In NBC's case, the research push reflected dissatisfaction with Nielsen's ratings system's capacity to capture viewing and engagement patterns of newly dispersed audiences and concern about its shrinking share of the advertising market. NBC's research, and that of the BBC and other content providers, into mobile media use has significant implications for the future of programming, scheduling, online strategy and audience measurement. During

the Beijing Olympic Games in August 2008, NBC worked with a variety of research companies measuring viewing on its subscription channels, its website and its service for mobile audiences. The ultimate product was the Total Audience Measurement Index (TAMI), a combination of data from different media and different panellists. Unique browsers, video streams, page views, and time spent online at NBCOlympics.com were measured by Quantcast. An online survey was conducted by Knowledge Networks of 500 different Olympics watchers per day who kept a media diary to record how they watched the Olympics, where, when and on what media. Integrated Media Measurement Inc. (IMMI) established a panel of 40 people with cell phones equipped to record sound bytes in programme signals that allow measurement of time spent watching or interacting with Olympics coverage on all platforms throughout the day. A further 80 people in two major markets formed the Olympics Qualitative Panel for interviews and focus groups, and in partnership with the IAG, NBC conducted surveys of consumers' recall of ads, brands, marketing intent and consumer behaviour across television, internet and mobile. Nielsen measured television ratings, Rentrak monitored video-on-demand usage, and viewing through personal video recorders was also counted. Over 17 days, NBC distributed 3,600 hours of video over broadcast and cable television, via the website, and over mobile telephone networks.

At the Vancouver Winter Olympics in February 2010, NBC added to this research effort by employing up to 15,000 respondents, including 2,000 equipped with Arbitron Portable People Meters (PPMs), and 40 with IMMI's mobile technology, both of which can report out-of-home and at-home viewing. Research company Keller Fay was hired to monitor social networking sites and viral communication. But despite a research budget in the 'mid six figures', NBC foreshadowed a loss on the Vancouver Olympics of US\$250 million (Chozick 2010). Once again, the scale of the research, and the associated costs, make such ventures special rather than regular events, and it is difficult to see many individual media companies taking on such an exercise alone in the future.

Efforts to monitor audience behaviour anytime, anywhere, on any device, have been hampered by differences between media in the metrics, methods and terminology used to track audiences, as well as by the lack of broadly accepted standards in online viewing measurement. Broadcasters and traditional television providers have established online portals either independently or collaboratively through services like Hulu, or through dedicated 'channels' on YouTube to both provide for and try to profit from online video viewing. Initiatives like Time Warner's 'TV Anywhere' measurement of streams, average minutes and other user data taken from server logs can be combined with data from Nielsen's NetView panel or VideoCensus system, or comScore's Video Metrix to paint a picture of online viewing behaviour, but there are still many questions and discrepancies.

New metrics and analytical systems that have been developed to answer some of the questions raised by technological change also pose challenges to ratings providers about their capacity to deal with the explosion of raw and customized data on audience behaviour. The volume of information about audience and consumer behaviour that is available for aggregation and analysis has grown enormously, but with it has come a host of uncertainties about the direction and use of audience measurement, and of the ratings. Uncertainty has driven an extraordinary research effort, a flight to accountability, in which a proliferating number of information and research companies have tried to make sense of the accumulating data about media use, often with conflicting results. This was one of the reasons behind what Alan Wurtzel calls the 'crisis in measurement', although the wealth of data and the efforts being made to analyse it may mean that this period could be looked back on as a golden age if the industry's ideals of massive amounts of data that can be cross-tabulated and 'fused' with other data sets can be realized. This would potentially produce the advertising industry's holy grail: single source, or what the World Federation of Advertisers calls 'consumer-centric holistic measurement', although serious questions about privacy would also arise.

Despite the crisis, which is multifaceted, ratings data are still and will continue to be in demand because there will always be need and use for common currencies for buying and selling advertising and programme content. There will undoubtedly be changes in the practicalities of audience measurement, particularly given the challenges presented by the likely spread of broadband-enabled set-top boxes. Information gathered from individual set top boxes can inform the insertion of advertising tailored to viewers' interests (as determined by past preferences in programming and viewing of advertising) into programme streams. The expectation is that viewers will be more 'engaged' with tailored advertising that speaks to their interests than with the scatter-gun, un-targeted advertising typical of broadcast and pre-digital television. The emotionally engaged audience is valued extremely highly for the bond they form with a brand.

Neuroscience, Neuromarketing and New Technologies of Measurement

Cross-media ratings projects like Harris Interactive's work with MTV Networks on 'Multiscreen Engagement' have emphasized the need to study the emotional connections between audiences and content (Harris Interactive and MTV Networks 2008). The Multiscreen Engagement study surveyed 20,000 people to discern engagement with MTV programmes across media. The study found that multiplatform media campaigns are two to three times more 'effective' than

single-platform campaigns, even though television is the most important medium for brand awareness. For audiences to seek out and proliferate content about a particular programme across media and devices, the study found that a strong emotional connection or level of engagement must be present. It also found that multiplatform media campaigns are two to three times more 'effective' as single-platform campaigns, even though television is the most important medium for brand awareness. Purchase intent, or consideration, was reported to have nearly doubled when brands' advertising was recognized across platforms.

In a paper presented at the Advertising Research Foundation's annual convention in 2007, British academic Robert Heath developed definitions of attention and engagement, and outlined the distinction between them:

Active attention is primarily a rational construct, and level of attention is therefore defined as the amount of conscious 'thinking' going on when an advertisement is being processed. Engagement is a subconscious emotional construct, and level of engagement is therefore defined as the amount of 'feeling' going on when an advertisement is being processed. (Heath 2007)

Using recent research on emotions and cognition, Heath argues, following Antonio Damasio, that 'emotions and feelings are always formed pre-cognitively'. This approach turns on its head Lavidge and Steiner's influential thesis that argues that motivation is the sole influence on decision-making (Lavidge and Steiner 1961). Heath argues that emotional and subconscious processing form attitudes about decisions before conscious thought kicks in. Following from this is the finding that attitudes (towards brands, in this case) 'can be changed without active conscious processing' and so 'the level of engagement a consumer has with advertising is going to be entirely dictated by the amount of "feeling" that goes on at the start of the process'. If this is the case, then tapping into that feeling will be enormously profitable for advertisers. But how to access this subconscious feeling and trigger the elusive 'buy-button in the brain' (*Nature Neuroscience* 2004)?

Step forward neuromarketing, which has been described as 'the application of neuroscientific methods to analyse and understand human behaviour in relation to markets and marketing exchanges' (Lee, Broderick and Chamberlain 2006: 200). A variety of techniques and methods fall under this definition. First, electroencephalography or EEG, in which the viewer-subject wears a hat or helmet to which a number of sensors are attached. The sensors measure brain activity indicative of attention, emotional engagement and memory retention. Second, functional magnetic resonance (fMRI) measures brain activity by monitoring blood flows that accompany neural activity. Unlike an earlier method of generating images of brain activity, positron emission tomography or PET, fMRI is non-invasive

(not requiring injection of radioactive isotopes as in PET) and quick to perform. The disadvantages of fMRI include its cost, and the requirement that viewer-subjects must be placed in an fMRI machine (although the machines are becoming smaller and more portable). Third, other physiological measures such as galvanic skin response and heart-rate monitoring which measure stress (or emotional response) can be combined with eye-tracking and facial expression monitoring to measure attention and engagement. These methods may then be followed up through interviews.

By directly measuring brain or other bodily responses, proponents argue that neuromarketing is able to circumvent the problem of subjects' stated responses to advertising not matching their buying behaviour. Neuromarketing purports to measure 'direct responses' to advertisements, so that responses can be collected while subjects are participating in the behaviour. Unlike studies of engagement which rely on self-reporting and which, as a result, may be prone to a variety of errors, neuromarketing claims insight into responses to advertising that are unmediated by conscious thought or reflection.

Interest in neuromarketing has been stoked by a number of recent developments. In February 2008, Nielsen made a strategic investment in NeuroFocus, a company based in Berkeley, California, that uses brainwave analysis, eye-tracking and skin conductance tests to measure the effectiveness of advertising, branding, packaging, pricing and product design. In partnership, the companies became exclusive providers of neuromarketing research to film studios and television networks. Nielsen announced its intent to install NeuroFocus technology at the CBS Television City Research Center in Las Vegas, and later in the year the service was launched in Japan. NeuroFocus subsequently bought UK neuromarketing firm Neuroco, whose clients included Sky Broadcasting. In May 2008, the Walt Disney Company announced that it would build a new neuromarketing research facility in Austin, Texas, to be run in conjunction with Professor Duane Varan of Murdoch University, Western Australia. It was reported that the lab would test a range of advertising methods including 'interactivity, split screens, brand integration, sponsorships, addressable advertising, broadband video and mobile devices on a diverse group of subjects, with the results transmitted to [Murdoch University] for analysis' (Collings 2008). Each year, Sands Research releases split-screen videos showing the EEG data of the brain activity of a panel of viewers watching commercials screened during the NFL Super Bowl, traditionally the highest rating programme of the year. The EEG analysis is used to rank the commercials according to their 'Neuro Engagement Factor' or NEF. In Figure 5.4, eye-gaze analysis has been added to show which parts of the video people are looking at.

Figure 5.4 Sands Research brain maps and eye gaze for 2011 Super Bowl advertisement, 'VW Darth Vader'

Source: Used with permission, Sands Research, <http://www.sandsresearch.com/2011SBMovies.aspx>

In Australia, the Nine Network worked with Australian biometric measurement company Neuro-Insight using patented technology developed by Professor Richard Silberstein, founder of the Brain Science Institute at Swinburne University, to develop what it called the Program Engagement Power Index (PEPI). The PEPI uses a form of EEG analysis on viewers watching television programmes to gauge their popularity. Neuro-Insight is a rapidly growing company that has worked with major advertisers in Australia and from 2009 in Europe, following a deal with German media-buying agency Media Plus, who will provide neuromarketing research services under licence to advertisers and the media in Germany, Switzerland and Austria. Interestingly both Sands Research and Neuro-Insight's work has been used to argue the importance of story and narrative in producing successfully engaging content, which may be enough to ensure the survival of film and television drama.

The neuromarketing area illustrates the trends of convergence and proliferation that are shaping audience and consumer research. On one hand there is conglomeration, with Nielsen using its financial muscle to buy up competitors or start-ups it finds useful. On the other there is proliferation, as a growing number of firms are established, new metrics and technologies are developed, and existing ones modified. But neuromarketing is not an uncontested emerging technology

for ranking and rating responses to content. There have been concerns raised about the commercialization of academic research in this field, with one prestigious neuroscience journal dismissing neuromarketing as little more than a new fad, exploited by scientists and marketing consultants to blind corporate clients with science (*Nature Neuroscience* 2004), and another raising concerns about the ethics of using brain imaging techniques for marketing and market-related purposes (*Lancet Neurology* 2004). Then there is the small matter of the complex and subjective nature of human emotional experience or the individual's life context, affecting results. Neuromarketing is also a costly form of research, which limits the number of participants. It is also often conducted outside the normal or familiar viewing environment, and participants often have to wear special equipment or be subjected to various tests which will be difficult to replicate across a larger population.

Timeshifting and Technologies of Counting

Timeshifting of viewing has been possible since the introduction of the home VCR, but it has become more of an issue since the introduction of digital video recorders (DVRs) as a new technology of counting. The integration of functions for receiving and facilitating programme (information) flow, recording and storing programmes, and returning information to a service provider in set-top boxes like Sky+, Foxtel iQ, or TiVo has intensified the question of how ratings instruments accommodate timeshifted viewing. In the United States, Nielsen began reporting 'Average Commercial Minute' data in May 2007. The measure provides an average rating for the commercial minutes in each television programme, covering live viewing; live viewing plus DVR playback on the same day; and live viewing plus DVR playback for one, two, three and seven days. At the time, according to Nielsen, less than 20 per cent of US households had DVRs. The Live + 3 days or 'C3' measure quickly replaced the live programme ratings as the currency for buying and selling commercial time. At the time of the introduction of the Average Commercial Minute measure, Nielsen reported that:

Among households with DVRs, the average primetime broadcast program audience increases 40 per cent when including same day DVR playback and 73 per cent when including three days of playback. Audiences for commercial minutes within these broadcast programs increase 18 per cent and 32 per cent respectively. Both cable network and syndicated programs and commercials also show increases, although at lower rates. (Nielsen 2007)

In the United Kingdom, the Broadcasters' Audience Research Boards (BARB) introduced a service in 2010 which reports audiences for on-demand material that

has not been broadcast live within the previous week. (At present, ratings are only provided initially for programmes viewed live and recorded on the same day of transmission, with consolidated figures for all viewers capturing timeshifted viewing only up to seven days after transmission.) The BBC will also soon begin to publish consolidated data which will include content viewed on DVRs and the BBC iPlayer, which is reported to have had 350 million programme requests since the end of 2007, with an average 500,000 users requesting more than 1.2 million streams per day. According to the *Guardian*:

Timeshifting is booming ... Drama was by far the most popular timeshifted genre, with only 63 per cent of series and 68 per cent of soaps viewed live in the first two months of 2009, according to Sky's figures. The number of people who watched the first screening of the opening episode of the fifth series of Sky 1's *Lost* – 608,000 – was eclipsed by the 647,000 who chose to record it on Sky+. With repeats and on-demand included, its total audience reached 1.57 million. (Plunkett 2009)

The issue of measuring timeshifted viewing has historically been one of the main subjects of dispute between subscription television operators and OzTAM in Australia. Eventually the operators' frustrations would lead to a split, with Foxtel, Austar and MCn announcing in March 2008 that they would commission a new audience measurement system to begin reporting on 1 July 2009. There had been a row between subscription television operators and OzTAM in 2004 after the findings of a commissioned research report conflicted with data provided by OzTAM about viewing of the 'catch-up' channels (rebroadcasts of particular channels usually on a two-hour delay) (Sinclair 2004). Foxtel launched the iQ box which incorporated a DVR in February 2005, and in the same month OzTAM changed its methodology for measuring subscription television audiences, weighting data from this panel separately from the regional and metropolitan free-to-air broadcasting panels to better reflect age and demographic spreads and larger average household size of subscribers. The change in methodology was anticipated to result in an increase in ratings for subscription services (Sinclair 2005). By November 2005, more than one million digital set-top boxes were reported to have been installed in Australian homes, but according to research by OzTAM and Eureka Strategy for the Australian Communications and Media Authority, only 10 per cent were being used to pick up enhanced digital services (Douglas 2005).

In March 2006, ASTRA called for tenders for its audience measurement contract, which was due to expire at the end of 2007. ASTRA wanted the successful tenderer to deliver data on use of interactive services, timeshifted viewing and non-broadcast use of the television set, perhaps indicating dissatisfaction with the OzTAM/Eureka

Strategy findings (Schulze 2006). By December 2006, ASTRA was reported to be contemplating commissioning Taylor Nelson Sofres (TNS) to set up a new ratings system that would include out-of-home, timeshifted viewing, mobile television measurement and data on non-broadcast uses of the television set (Sinclair 2007). When in April 2007 OzTAM signed a new seven-year contract with AGB Nielsen Media Research to provide ratings data from January 2008, ASTRA declined to commit, citing concerns about OzTAM's failure to address concerns about measurement of new digital services and timeshifted viewing. Figures from the United Kingdom at this time showed over 90 per cent of Sky+ households (the equivalent of households with Foxtel iQ box) timeshifted viewing. At the time of the signing of the new deal between OzTAM and AGB Nielsen, OzTAM chair Doug Peiffer said OzTAM 'hoped' to start reporting timeshifted viewing in 2008 (Canning 2007; McIntyre 2007). Later in April 2007, the discontent between subscription television operators and OzTAM became public again when David Dale revealed in the *Sydney Morning Herald* that OzTAM was using different methods to report ratings of shows on free-to-air and subscription television that were screened more than once during the week, to the detriment of the STV programme (Dale 2007). In the same month, media buyers were reported to be pressuring OzTAM to measure and report on non-broadcast use (which includes timeshifted viewing) of television sets.

In December 2007, OzTAM announced that it would begin reporting timeshifted viewing from February 2010 following trials of a new measurement system, Unitam. Just before Christmas 2007, agreement was finally reached between ASTRA and OzTAM for an extension of the agreement over audience measurement for the period 2008–14. Despite the new agreement with OzTAM, in March 2008, Foxtel, Austar and MCn announced that they would fund a new digital television audience measurement system with a panel size of 10,000. The system was to be created by TNS and based on a similar service already operating in the United Kingdom and the United States. The system measures timeshifted viewing, and responses to interactive advertising. It was reported at the time of the announcement that the system would cost approximately US\$3 million, or 1 per cent of projected revenue of subscription television operators in 2009. The system was intended to begin reporting in July 2009 (Sinclair 2008). The current service covers: Live – viewing of television broadcast content at the actual time of broadcast (live broadcast); As Live – viewing of recorded television broadcast content that occurs within the same research day as broadcast, but at a different time to the original live broadcast time (a research day is 2 a.m. to 2 a.m.); Time Shift – viewing of recorded television broadcast content up to seven days after the live broadcast time; and, Playback – As Live + Time Shift viewing.

Ian Garland noted that the move by the television companies was necessary because media agencies had their own similar tools, and there was a need for transparency and accountability as to who is watching what, and when.

Advertisers want information not just on 30-second and linear ads, but also value-added components, such as sponsorship campaigns ... The new system provides us with a competitive advantage, not just with advertisers, but because we understand our viewers better. Seven, with their TiVo device, could do something similar to us, but it's just one small portion of the market – our business model is just very different to theirs. (Garland 2008)

Channel Seven network director of sales, James Warburton, claimed his company was 'not that far behind', and acknowledged that measurement of timeshifted viewing is a critical feature: 'Timeshift is the vital element – 70 per cent of viewing is done live, with 10–15 per cent of recorded shows shown that night. PVR (personal video recorder) users watch two hours more of television than other users, so this notion that they are avoiding ads is wrong – they are seeing more impacts than ever before' (Milman 2008).

The Increasing Technical Complexity of Audience Measurement

As the discussion above shows the challenges to audience measurement services are multiplying. Advertisers and media buyers are seeking and requesting ever more detailed and granulated data about audiences and audience behaviour. Market fragmentation and the expansion of entertainment options have further increased the difficulties for interested parties to gain a full picture of audience behaviour. As a result of these issues and developments, there has been significant growth in the number and variety of research services and technologies of counting offered around the world. Increasing technological sophistication has allowed data to be collected from significantly larger sample groups and from a variety of databases to be integrated and analysed together. The growth in sample sizes and the development of new services has been described as the 'flight to accountability' in measurement services. Some evidence of this is provided by the host of new services announced in recent years.

January 2007: TiVo's StopItWatch service, claimed by the company to be 'the first national, syndicated measurement of program and commercial-spot television viewership by digital recording households in the United States', is launched. It was the first service to provide live and timeshifted viewing data on a second-by-second basis.

February 2007: Nielsen in the United States announces DigitalPlus service to measure digital set-top box data.

July 2007: TNS Media Research develops CommercialView service, combining second-by-second data from 300,000 Charter Communications cable subscribers in Los Angeles with ad occurrence data.

September 2007: Rentrak unveils Television Essentials service. By March 2009, the service is claimed to process data from seven million set-top boxes, analysing audience flow, audience retention, day-part analysis for linear and on-demand television.

December 2007: OzTAM/AGB Nielsen announce their new Unitam service in Australia due to report on timeshifted viewing from January 2010.

January 2008: TNS Media Research launches DirectView service, using second-by-second set-top box data from 100,000 DirecTV subscribers around the United States. Nielsen launches the Nielsen On Demand Reporting & Analytics (NORA) service to aggregate and report on video on demand usage collected from set-top boxes of Comcast cable subscribers.

February 2008: Nielsen launches VideoCensus online video measurement service. In the same month Nielsen acquires Audience Analytics, provider of Audience Watch service, and makes strategic investment in NeuroFocus, a Californian neuromarketing company.

March 2008: Optimedia launches Content Power Ratings report, a quarterly index ranking reach of top 100 programmes based on number and quality of viewers across traditional and digital media. Content Power Ratings combines proprietary research, Nielsen Media Research's NTI database, comScore's Media Metrix, E-Poll's FastTrack, Keller Fay Group's TalkTrack, and Factiva.

April 2008: Nielsen buys IAG Research, a New York-based firm specializing in measuring consumer engagement with television programmes, national commercials and product placements.

May 2008: Disney-ABC launch Advertising Value Index (AVI). AVI 'allows advertisers to choose from more than 15 criteria, including factors such as income level, education, employment status, how long viewers tune in to commercials or how engaged they are with the program' (Kang and Vranica 2008). Irish firm Openet announces phase one of Advanced Advertising Solutions service. Targeted at cable television providers, it 'enables the correlation of real-time subscriber activity such as television viewing behavior and broadband mobile service usage with demographic and psychographic profiling information'.

June 2008: TNS Media Research's Return Path Data (RPD) service is launched. The service extracts data from set-top boxes to track viewing patterns and service use. The service is trialed in South Africa and in the United States through TNS's partnership with Comcast. The service claimed to 'give broadcasters and advertisers

the chance to target viewers with bespoke commercials' (Shepherd 2008). TRA and TiVo announce a deal, in which TRA will access anonymous viewing data from TiVo's 1.7 million set-top boxes across United States. TRA matches viewing data with purchase data from more than 70 million frequent-shopper cards. Partnership merges TRAnalytics service with TiVo's StopItWatch ratings service.

November 2008: TRA's announces 370,000-household, nationwide, anonymous single-source database which overlays television viewing data from 1.5 million cable and TiVo households, consumer package goods purchase data from more than 55 million households, and anonymous demographic data from more than 100 million households.

Calls for Harmonization

In the face of the proliferation of services outlined above, media buyers and advertisers have issued calls for harmonization of metrics and terminology to allow meaningful comparisons to be made across media. Back in 2005, bodies representing television, radio, magazine and newspaper owners met to devise common definitions of age and economic affluence of Australian consumers as a first step towards harmonization of demographics across all media (Lee 2005). Problems with the measurement of online audiences have also intensified calls for a unified approach. In February 2008 at a meeting of the Interactive Advertising Bureau, attendees urged internet publishers (e.g. Ninemsn, News Digital Media, Fairfax and Yahoo!) to spend up to US\$10 million to fund a new online ratings system to allow advertisers to compare online audiences with those for television, radio and other media. This followed concerns over slowing general internet ad growth (up 21 per cent in 2007 compared with 56 per cent in 2006), and feedback that ambiguity and inconsistency among audience metrics was hindering high-quality online brand advertising. In 2007, the Interactive Advertising Bureau (IAB) tried to establish ground rules and in August the organization issued a research document and invitation to companies to tender for the development of an online audience measurement system, but media agencies expressed dissatisfaction with IAB's November 2007 announcement that it favoured panel methodology rather than tagging sites.

The agencies wanted a hybrid system that takes site-centric data and uses it to calibrate panel data for accuracy. In early 2008, media agencies were reported to be working with Nielsen to develop a hybrid system called Data Integration, although there were concerns that Nielsen's NetView panel size would need to be doubled to provide more accurate data and capture traffic to niche websites. In February 2009, it was reported that Nielsen was likely to be the only provider of

the online measurement system. Roy Morgan Research, comScore and Amethon Solutions/Aimstats had also responded to the 2007 brief, but only Nielsen was prepared to let an independent auditor review its online research system. Nielsen appeared to be on track to launch an expanded panel of 5,000 by June 2009 to track internet use at home and at work (the current panel of 3,770 only tracks home use). Paul Fisher, Chief Executive of IAB, says its aims are 'to fix the panel, create numbers based on people – not unique browsers – and give advertisers and media buyers audience-reach figures that will enable them to compare the Internet with other media' (Shoebridge 2009).

In the United States, Nielsen has a panel of 30,000 for its NetView product. Web activity is tracked through interviews and meters. But some analysts argue that panels undercount online audiences by between one third and one half. Research companies like Nielsen and comScore like panels because they provide demographic data and give information about what people do when they have seen an online advertisement. Quantcast's service uses panel-like data or 'reference samples' provided by third parties including market research firms, internet service providers and toolbar companies. Quantcast uses server logs, adjusted for multiple computers, spiders and bots, and cookie deleters, and combines the 'reference samples' with these logs using a 'mass inference algorithm' developed in conjunction with Stanford University. The company claims 85,000 'publishers' including Disney-ABC, NBC, CBS, MTV, Fox and BusinessWeek use its service. Criticism of Quantcast centres on its low take-up; it won't become a new currency until more publishers elect to be counted (Pontin 2009).

Measurement of online video use presents a variety of problems, but the measures appear to be becoming more robust. Most broadcasters and traditional television providers in the United States now either have their own web portals or use the Hulu player. The BBC iPlayer has been a huge success in the United Kingdom, while ABC's iView in Australia has had limited but still impressive success. Measurement of streams, average minutes and other user data taken from the broadcaster/providers' servers combined with data from the leading audience measurement services (Nielsen's VideoCensus and comScore's Video Metrix) are showing some interesting trends, although YouTube continues to dominate the field. In data on (US) online video usage in February, Nielsen reported that YouTube is by far and away the largest online video provider, with over 5 billion videos streamed from its site by over 88 million unique viewers. Hulu is the second largest provider, with just over 300 million streams in February. And yet YouTube still struggles to attract advertising, while Hulu is attracting major brands to its service. Forrester Research's prediction that 187 billion videos would be streamed over the internet by 2009 was close to the mark.

Summary

The world is made up of countries at different levels of diffusion of audience ratings technology as well as different levels of development of media technologies. Panel technology for audience ratings is well established and each year more countries come within the syndicated fold.

As we have seen, there is now a range of different technologies competing for the measurement pie. Measuring the motivation of the audience has always been a part of audience ratings research, whether driven by Freudian theory or by some other approach. However, modern techniques provide a new dimension where eye gaze can be studied, heartbeat recorded, brains scanned and galvanic skin responses obtained. The aim with these techniques is to gain predictive advantage and to understand what audiences want now and what drives their needs into the future. As noted at the beginning of the chapter, though, there is no industry agreement on what is going to happen with biometrics or other techniques as a stable currency.

Measurement of this kind, of course, raises the problem of intrusion into people's lives, not only in terms of privacy but also, as we witnessed in the Chapter 3 on panels and surveys, issues of intrusion into the technology itself. These will be explored further in Chapter 9. The role of the ratings provider in this complex mix is what the authors will now turn to.