



Impact of DVRs on TV Viewing in Japan

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About This Report

- At present, DVRs* can be found in an estimated 15% of Japanese households. Benefiting from demand by people replacing their VCRs, DVRs are expected to continue proliferating in Japan. Even when all VCRs have been replaced, the onslaught of DVRs will not stop. Already many users have realized that hard-disk recording relieves them of the inconvenience of handling tapes and electronic programming guides (EPGs) make recording much easier. In the future, advances in technologies for automatically recording programs according to the user's viewing patterns may encourage people to watch more prerecorded programs. DVRs thus have the potential to change our TV viewing environment.
- Since 2000—soon after the launch of TiVo, which has pioneered the DVR market in the United States—Dentsu has conducted market research, both in Japan and overseas, into actual DVR usage patterns. We have also conducted research into the impact of DVRs on the TV advertising business. In addition to evaluating DVR functions and gaining a grasp of changing TV viewing styles, we have confirmed the effectiveness of commercials by identifying the unique traits of DVR users and analyzing commercial awareness rates.
- This report summarizes the most important results of our research to date and offers Dentsu's thoughts on how the DVR will affect TV viewing patterns.

*As used in this report, DVR is defined as a digital video recorder with a built-in hard disk.

Executive Summary

<Overview>

- **DVRs encourage live viewing and most viewing by DVR users occurs in real time*.**
 - ✓ The introduction of DVRs was expected to encourage more timeshifted** viewing, thus eroding time spent on live viewing. This has not happened. Live viewing hours actually increase among DVR users. Our analyses of TV viewing patterns show that the same household's monthly average live viewing hours for the six months after acquiring a DVR were 12% higher than the monthly average prior to acquisition.
 - ✓ Live viewing accounts for 88% of total TV viewing hours in households with DVRs, indicating that live viewing continues to occupy the bulk of TV viewing.

- **DVRs have not eroded recognition of commercials.**
 - ✓ Our analyses of commercial awareness indicate clearly that awareness rates among DVR users are generally higher than non-DVR households.
 - ✓ DVR users are sensitive to information and generally have a favorable view of commercials. DVR users therefore represent a good target group for efficient promotion of commercial messages.

- **Unlike in the United States and the United Kingdom, in Japan only live viewing is counted in the current TV audience measurement system.**
 - ✓ In Japan, only live viewing is subject to the current TV audience measurement system. Recording—including, but not limited to using a DVR while away or watching another program or viewing of recorded programs -- is not included in viewer ratings. Moreover, the panel used in Japan to measure viewer ratings includes households with DVRs. Accordingly, changes to live viewing caused by DVR usage are reflected in viewer rating trends.
 - ✓ In contrast, in the United States recorded programs are included in viewer ratings regardless of whether they are actually played back. Therefore, even programs that are never watched are reflected. Because only live viewing is subject to audience measurement in Japan, programs that are not watched in real time are not reflected in viewer ratings. Because the definitions of viewer ratings in the United States and Japan are different, it is a mistake to assume that the effects of DVRs in the two countries will be the same.

- **DVRs enable avid TV viewers to enjoy the viewing experience even more.**
 - ✓ TV has unique value as a medium, thanks to TV stations' superb content production and programming skills.
 - ✓ Accumulated research results reveal that DVRs can be seen as providing increased opportunities for TV viewing.

* "Live" viewing means watching a program as it is broadcast.

** "Timeshifted" viewing means watching a recorded program at a later time.

Executive Summary

<Main Points>

[Overseas DVR-Related Reports] ... page 10

- **Overseas research reports are not fully applicable to the Japanese market, which uses different parameters.**
 - Numerous research reports about DVRs have been published to date, primarily in overseas markets. How DVRs are supplied to users, however, as well as what product functions are emphasized in marketing them to consumers, differs considerably by market. In overseas markets, notably Europe and North America, DVR markets are driven by hard disk-equipped set-top boxes (STBs) supplied to subscribers as part of the service provided by satellite and cable broadcasters. In Japan, however, DVRs are generally sold to consumers directly by home electronic appliance manufacturers. Viewer rating measurement systems—the basic infrastructure of the advertising business—also differ by country. For this reason, views on how DVRs affect the broadcasting industry are also different in Japan versus overseas countries. Overseas reports detailing the impact of DVRs on TV viewing styles and the advertising business do not apply to the Japanese business environment, and thus should be treated with extreme caution.

[Issues for Researching Actual Viewing Patterns of DVR Users] ... page 12

- **Gaining an accurate understanding of TV viewing trends in DVR households requires quantitative analyses of the overall TV viewing patterns of these households.**
 - There are major problems inherent in research methods used to ascertain DVR usage. Qualitative research, based on interviews with DVR users about their TV viewing patterns, includes respondents' subjective opinions and thus does not provide an accurate picture. Meanwhile, quantitative research, based on analyses of viewing measurement data, tends to rely heavily on the DVR log data, making it difficult to properly quantify the TV viewing characteristics of DVR households.
 - Given this situation, Dentsu turned to viewer rating research in the United Kingdom, where figures for recorded programs watched within seven days are added to those for live viewing. Using U.K. viewer rating data obtained in this way, we conducted research into timeshifted viewing using VCRs and DVRs, and gained an insight into how VCRs are used for recording and playback purposes, as well as the effects of DVRs on live viewing.

[VCR Usage] ... pages 13–15

- **VCRs are used as playback devices, but time spent watching VCR-recorded programs accounted for a mere 3% of total TV viewing hours.**
 - According to Video Research Ltd., VCR playback time averages 189 minutes per week, greatly exceeding the average VCR recording time of 127 minutes per week. Playback time includes playback of recorded programs as well as rental/sell videos. This provides a strong indication that VCRs are used more as playback devices than as recording devices.
 - In Japan, time spent watching VCR playback, including rental/sell videos, accounts for 3.7% of total TV viewing hours.
 - According to research in the United Kingdom, programs watched within seven days of being recorded accounted for 2.6% of total TV viewing hours. This shows that live viewing represents an overwhelming share of total TV viewing, both in Japan and the United Kingdom.

Executive Summary

- **Recorded programs are usually watched within seven days. Dramas and movies are more conducive to playback viewing, whereas news and sports programs tend to be watched live.**
 - Recorded programs are usually watched almost immediately after being recorded, or at least within seven days.
 - Programs conducive to recording and playback are dramas and movies. In contrast, viewers tend to watch news and sports programs live.
 - These trends appear to be universal, irrespective of country or recording medium (VCR or DVR).

[DVR Usage]

- **Live viewing accounts for 88% of total TV viewing time in DVR households in the United Kingdom and live viewing hours increase 12% after acquisition of a DVR. ... pages 16–17**
 - Analyses of viewer ratings in the United Kingdom show that live viewing accounted for 88% of total TV viewing time in DVR households.
 - Comparisons of viewing hours before and after DVR acquisition show that, rather than causing an increase in playback viewing at the expense of live viewing, monthly live viewing actually increases 12% in the six months after acquisition of a DVR.
- **Average daily live viewing (commercial channels only) in Japanese DVR households is 93.4% that of non-DVR households on weekdays and 94.8% on weekends. ... page 18**
 - A diary survey of TV viewing patterns (commercial channels only) in DVR and non-DVR households in Japan showed live viewing in DVR households is slightly lower than non-DVR households. But the difference is not 40%–50%, as some existing reports suggest. Assuming live viewing hours between 6:00 and 24:00 of non-DVR households to be 100%, live viewing hours in DVR households was 93.4% on weekdays and 94.8% on weekends.
 - Determining the reasons for the discrepancy will require more detailed research. Does the difference in viewing hours between the two groups stem from the playback time spent by DVR households, or from the specific attributes of DVR owners? (For example, are DVR owners more apt to interact with other forms of media?)

Executive Summary

[DVR User Analysis] ... page 19

■ Sensitivity to information and commercial awareness rates are high among DVR users.

- At present, DVR users tend to be highly sensitive to information and more inclined than non-DVR owners to use other media, including newspapers and magazines. Our research clearly shows that DVR users also tend to have a more favorable attitude toward commercials in general.
- It is easy to conclude that commercial awareness among DVR owners would decline due to the use of the “commercial-skip” function when watching recorded programs. In a commercial awareness survey conducted by Dentsu, however, DVR owners surveyed had a higher commercial awareness rate than non-DVR owners in practically all cases studied.
- Based on accumulated research results, we can conclude that DVR owners acquire DVRs because of their basic love for TV, and that DVR acquisition provides increased opportunities for them to view programs and commercials they did not view before.

[Viewer Rating Survey] ... pages 20–21

■ Unlike in the United States and the United Kingdom, in Japan only live viewing is subject to the current TV audience measurement system.

- In Japan, only live viewing is subject to the current TV audience measurement system. Recording—not only using a DVR—while away or watching another program and viewing of recorded programs are not included in viewer ratings. Moreover, the panel used in Japan to measure viewing ratings includes households with DVRs. Accordingly, changes to live viewing caused by DVR usage are reflected in viewer rating trends.
- In contrast, in the United States and the United Kingdom, where VCR recording and playback are included in TV audience measurements respectively, moves are under way to redefine viewer ratings and revamp measurement systems in response to the penetration of DVRs.

[Media Consumption and the Reach of TV] ... page 22

■ TV's position as the overwhelming leader in terms of reach remains unchanged.

- TV viewing hours are trending upwards, with average daily viewing rising by 8.7 minutes between 1998 and 2004. Underpinning TV's reach are TV stations' superb content production and programming skills, which cannot be found in other media.
- If TV is regarded as a portal for delivering information to many people simultaneously, then connecting TVs with PCs and cellular phones will permit interactivity and unleash latent value.

Executive Summary

[DVRs and the TV Advertising Business] ... page 23

- **While differences exist in surveying viewer ratings in Japan, it is evident that DVRs do not have a direct effect on the TV advertising business.**
 - In Japan, only live viewing is subject to the current TV audience measurement system. Recording—not only using a DVR—while away or watching another program and viewing of recorded programs are not included in viewer ratings. Moreover, the panel used in Japan to measure viewer ratings includes households with DVRs. Accordingly, changes to live viewing caused by DVR usage are reflected in viewer rating trends.
 - In contrast, in the United States recorded programs are included in viewer ratings regardless of whether they are actually played back. Therefore, even programs that are never watched are reflected. Because only live viewing is subject to audience measurement in Japan, programs that are not watched in real time are not reflected in viewer ratings. Because the definitions of viewer ratings in the United States and Japan are different, it is a mistake to assume that the effects of DVRs in the two countries will be the same.
 - Dentsu's research* confirms that DVR acquisition leads to increases in live viewing. Moreover, commercial awareness rates are higher among DVR owners. After conducting a series of surveys, we can conclude that DVRs provide increased opportunities for TV viewing.

* Dentsu will continue its research into the effects of DVRs on TV viewing.

Overview of Surveys and Data Sources Covered in This Report

[Dentsu Surveys]

■ U.S. Survey

- TiVo acceptability survey (joint survey with Video Research)
 - Survey period: October 2000–January 2001
 - The survey focused on 12 general households (six Japanese and six American) in the eastern United States; TiVo DVRs were installed for four months, and each household was interviewed twice.
 - The survey focused on such items as changes in usage frequency, TV viewing habits and lifestyle patterns.

■ U.K. Surveys

- VCR usage survey
 - Survey period: October 2003
 - Data was extracted from VCR recording and playback logs, taken from Broadcasters' Audience Research Board Ltd.* (BARB) data.
 - The survey compared live and playback viewing and included analyses based on timing of playback of recorded programs, attribute-specific playback behavior and program genre.
- DVR Usage Survey
 - Survey period: October 2004
 - Analyzed TV viewer ratings among households with Sky+ (STB with built-in hard disk for SkyDigital satellite broadcasts), taken from BARB data.
 - For the purposes of data processing, timeshifted viewing via Sky+ is included in the "EPG usage" category. For this reason, we regard any discrepancy between Sky+ viewing time and average EPG usage for SkyDigital households as timeshifted viewing time.
 - The survey included live versus timeshifted viewing among Sky+ households, changes in viewing habits before and after Sky+ installation and analyses based on channel-specific considerations.

■ Domestic Surveys

- Joint Survey with Video Research
 - Survey period: Ongoing since February 2004
 - The survey was conducted via Internet and focused group interviews.
 - The survey analyzes the impact of DVR viewing patterns on recording and timeshifted viewing behavior, EPG usage frequency and live viewing patterns.
- Media Interaction Analysis by Dentsu Original Panel (4,621 people)
 - Survey period: March 2005
- Commercial Awareness Ratio Analysis
 - Survey period: Ongoing monthly analyses since November 2004
 - Two groupings, each of 630 people, in the Kanto region were tested each month for their awareness of 40 commercials.

[Data Sources]

- *Home VCR Recording and Playback Ratio Report*, Video Research Ltd., April 2005 (Kanto region)
- *Media Contact Report 2004*, Video Research Ltd.

* The Broadcasters' Audience Research Board (BARB) is a TV viewer rating measurement organization consisting of major U.K. broadcasters, advertising industry bodies and others. It provides viewer-related data useful for the TV media business. Currently, two types of ratings are provided for TV viewing in the United Kingdom: live viewing and VCR playback viewing within seven days of recording. There are moves to position DVR users as a new survey target group for measuring playback patterns, and BARB is aiming to commence full-scale activities in this area in 2005.

Estimate for Future DVR Penetration

DVRs will continue to proliferate, backed by replacement demand from VCR owners. Hard disk storage capacity, digital-ready and network interactivity functions are also expected to improve.

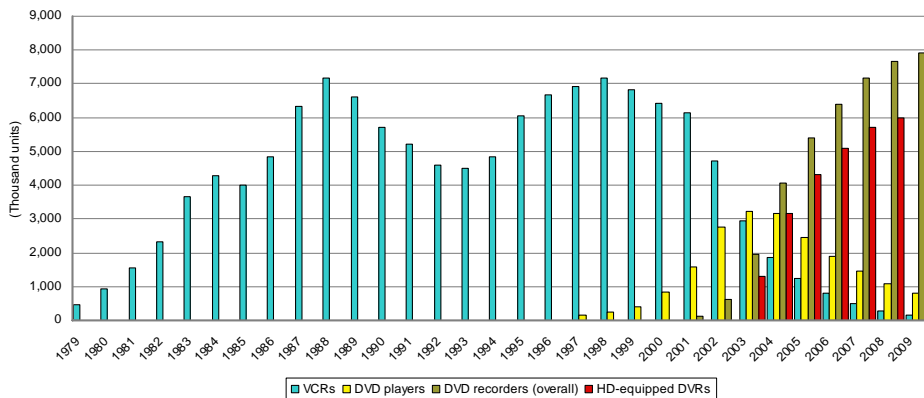
[Penetration Estimate]

- At present, the DVR diffusion rate among Japanese households is estimated at approximately 15%. Over the medium and long terms, DVRs will proliferate further, as these items have become strong sellers at home electronic appliance retailers.
- The Japan Electronics and Information Technology Industries Association (JEITA) estimates that cumulative shipments of DVRs will reach 31.9 million units by 2009. Based on past shipment statistics, VCRs have a demand cycle of just under 10 years. This cycle and the estimated upsurge in shipments of DVRs overlap almost perfectly. With VCRs currently a fixture in approximately 90% of households, replacement demand will add further momentum to the penetration of DVRs.

[Enhanced Functions]

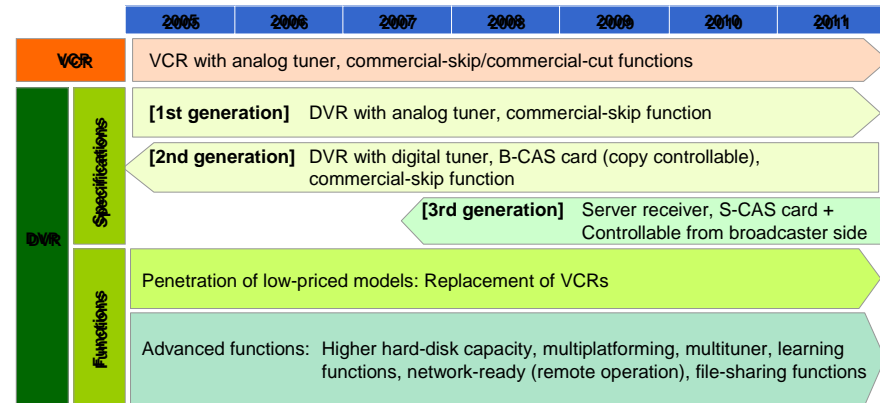
- In addition to increases in shipments, DVRs are also expected to see advances in terms of performance.
- Mainstream DVRs on the market today are equipped with analog tuners. However, 2004 brought the launch of models with digital tuners. As Japan is scheduled to shift to terrestrial digital broadcasting by 2011, digitally compatible models are expected to propel future penetration.
- Home server-type models are also likely to be released, in response to the emergence of server-based broadcasting.
- Paralleling these trends will be ongoing advances in other areas, such as hard-disk storage capacity, multiplatforming, the addition of learning functions, network connectivity and file-sharing functions. The market is thus expected to become polarized between low-priced, limited-function models and cutting-edge models.

[VCR and DVR Shipments]



* Figures from 2005 are estimates (prepared from JEITA data)

[DVR Evolution]



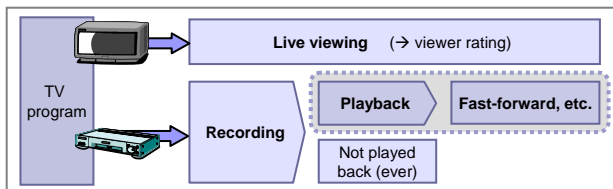
How Recording Devices Affect TV Viewing

DVRs will not cause all TV viewing to be timeshifted. The challenge is to determine the extent to which users employ the DVR's functions and to grasp changes in live viewing hours, as well as in recording and playback volume.

[Premise]

- Dentsu has conducted a series of surveys, principally to determine the extent to which DVR ownership leads to changes in live TV viewing habits.
- When considering this question, one must keep in mind that a program must be recorded before it is played back—whether the medium is a VCR or a DVR. Also, the “pause” and “fast-forward” functions can only be used when playing back recorded programs.
- This seemingly obvious point may be easy to overlook when considering the impact of DVRs. The fact is, however, that people who own DVRs will not move completely to timeshifted TV viewing. As the diagram below shows, we must gain a grasp of live viewing hours, as well as of recording and playback volume, in the context of home viewing. Then we must calculate the probability that fast-forward and other functions are used.

[TV Viewing Scenario]



- The volume of programs recorded will be determined largely by advances in DVR functions and increases in hard disk storage capacities. For example, hard disk-equipped STBs provided by cable and satellite broadcasters in overseas markets—and TiVo in the United States—have functions that automatically record programs as they are being watched live via the DVR. There is no need to turn the machine on when the user wants to record something. This means users can even pause, rewind and fast-forward programs they are watching in real time. According to TiVo acceptability research conducted by Dentsu and Video Research in the United States, these functions are highly rated by users.

- As detailed on page 17 of this report, however, use of this function accounts for only 10% of total TV viewing hours among Sky+ subscribers in the United Kingdom.

- DVRs with this function are practically nonexistent in the Japanese market, but it will be worth watching how various functions aimed at promoting recording and playback (such as the aforementioned automatic recording function) will develop to match the tastes of users in the future.

[Overseas DVR-Related Reports]

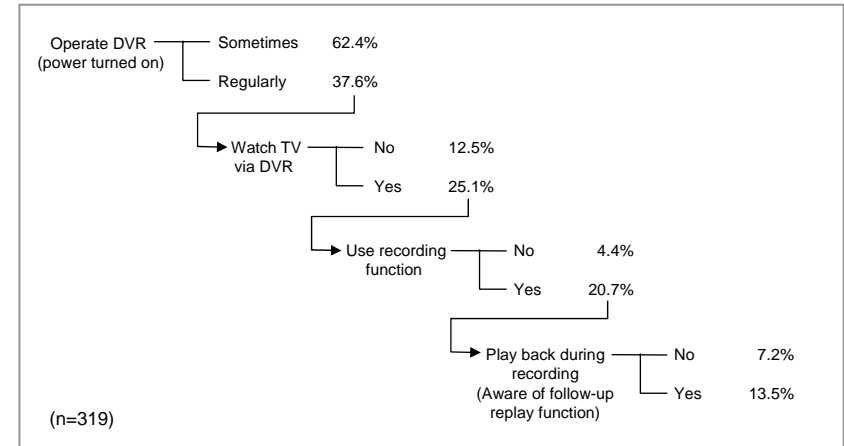
- Numerous research reports about DVRs have been published to date, primarily in overseas markets. How DVRs are supplied to users, however, as well as what product functions are emphasized in marketing them to consumers, differs considerably by market.
- In overseas markets, notably Europe and North America, DVR markets are driven by hard disk-equipped STBs supplied to subscribers as part of the service provided by satellite and cable broadcasters.
- In Japan, however, DVRs are generally sold to consumers directly by home electronic appliance manufacturers via electronics retailers. Viewer rating research methods—the basic infrastructure of the advertising business—also differ by country. For this reason, views on how DVRs affect the broadcasting industry are also different in Japan and overseas countries.
- Overseas reports detailing the impact of DVRs on TV viewing styles and the advertising business do not apply to the Japanese business environment, and thus should be treated with extreme caution.

How Recording Devices Affect TV Viewing

[Current Situation]

- To what extent has the DVR infiltrated the regular TV viewing patterns of consumers? To answer this question, in a joint survey with Video Research in 2004 Dentsu asked users how they use their DVRs.
- The simultaneous recording function, popular overseas, automatically records a program as it is viewed in real time via the DVR, allowing the user to timeshift at any time. This may have a significant effect on TV viewing patterns. At present, models with this function are practically nonexistent in Japan. Models available in Japan do, however, have a “follow-up replay” function that enables users to replay programs being recorded without have to wait until the recording is finished. Thanks to this function, a scenario similar to that provided by automatic recording should evolve in Japan.
- We selected a group of users of relatively high-spec equipment. From this group, we pinpointed those who have set up their systems to facilitate use of the follow-up replay function (constant DVR users and those who watch live programs via their DVR). As it turned out, those who use DVRs in environments conducive to use of the timeshifted viewing mode accounted for only 25% of all DVR users. Although we should be wary of generalizing, it seems only a limited number of DVR owners use all of the functions available.

[DVR Use Scenarios]



(Joint research by Dentsu and Video Research, 2004)

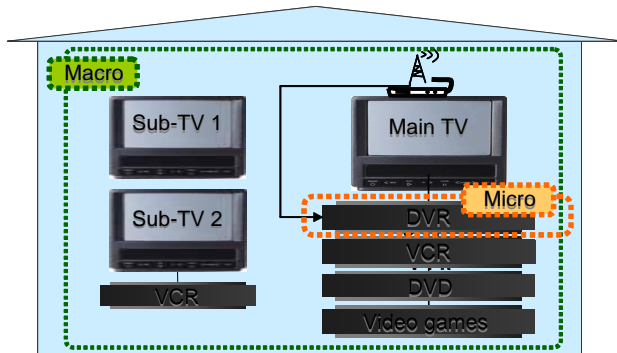
TV Viewing in DVR Households: Parameters and Research Methods

Gaining an accurate grasp of TV viewing trends in DVR households requires quantitative analysis of TV viewing patterns of entire households.

[Home TV Viewing Environment and Research]

- Most homes in Japan have more than one TV. The main TV, located in the living room, is usually connected to various peripheral devices, such as a DVR and video game console. When someone says “I watch TV at home,” it often means that they are watching one of these TVs, depending on the situation.
- DVRs are equipped with tuners that directly receive broadcast signals, but not all DVR households watch TV via the DVR unit. In the typical household, where families are busy rushing to school and work in the mornings, most people simply turn on the switch and watch via the tuner in the TV.
- In addition, “sub-TVs” located in other rooms will probably continue to be used for live viewing. The current viewer rating measurement system targets households with up to eight TV receivers, so the contribution of sub-TVs to overall household viewer ratings cannot be overlooked.
- To accurately comprehend the TV viewing scenarios of DVR households, we need to correctly define the parameters of home TV viewing. If we concentrate solely on how DVRs are used, we will not make much headway in addressing our key objective. So, what methods should be used to gain an accurate grasp of TV viewing patterns in entire households?

[Home TV Viewing Scenarios]



[Issues Related to Research Methods]

(1) Qualitative Research

- Direct questions to users via interviews or diaries.
- By asking users about their normal attitudes toward TV, we can gain a general picture of viewing habits without focusing on particular devices. The quality of responses, however, depends on how the questions are asked. It is very difficult to obtain a picture of viewing hours and patterns based on subjective and voluntary submissions.

(2) Quantitative Research

- Mechanical measurement of viewing data.
- Analysis of viewing history in a format that closely resembles normal viewer rating measurements can provide highly reliable data. In many cases, however, viewing history parameters are limited to programs viewed live via the DVR. It is impossible to account for live viewing using sub-TVs and other devices or direct viewing using the main TV tuner.

[Issues Concerning Survey Methods]

| | Macro Perspective (TV viewing of entire household) | Micro Perspective (TV viewing using DVR only) |
|---|--|--|
| Qualitative research (Questionnaires) | Reports, press coverage Underestimation of live viewing | — |
| Quantitative research (Viewer ratings, log data) | Ideal method for our research purpose → Audience measurement system in the U.K. | Only covers viewing using DVR Underestimation of live viewing |

- With all these factors in mind, Dentsu selected the U.K. viewer rating system, which enables a comprehensive and quantitative analysis of TV viewing patterns for entire households. Using this system, we analyzed TV viewing habits in VCR and DVR households in the United Kingdom.

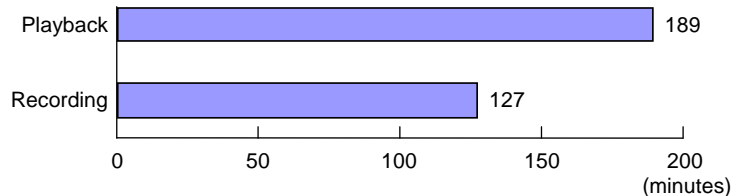
How Were VCRs Being Used?

Time spent playing back content on VCRs (whether recorded programs or rental/sell videos) is greater than that spent recording.

- VCRs are currently used in approximately 90% of Japanese households, but how are they being used? Three times a year, Video Research publishes its *Home VCR Recording and Playback Ratio Report*, which provides a valuable insight into how VCR households use their units for recording and playback purposes. Some of the findings are shown below.
- A look at VCR operating hours reveals that for every two hours spent recording programs in an average week, more than three hours are spent playing back content. This is because the latter includes recorded programs, rental videos and images captured on video cameras.
- If we also consider that many programs are recorded and never watched, it becomes clear that the use of VCRs as a device for playing back rental/sell videos accounts for a substantial proportion of total usage.

| Usage Status | Operating Status | | Data Provision | |
|--|-------------------|------------------|---------------------------|------------------------------|
| | TV | VCR | TV Data | VCR Data |
| Normal video viewing | View TV channel A | Off | Viewer rating (channel A) | |
| Timed recording while away | Off | Record channel C | | Recording rating (channel C) |
| Recording while watching other program | View TV channel A | Record channel B | Viewer rating (channel A) | Recording rating (channel B) |
| Simultaneous recording | View TV channel A | Record channel A | Viewer rating (channel A) | Recording rating (channel A) |
| Playback | Use open channel | Play back | | Playback ratio |

[VCR Recording/Playback (Average Minutes/Week)]



Home VCR Recording and Playback Ratio Report, Video Research Ltd., April 2005 (Kanto region)

[Home VCR Recording and Playback Ratio Report, Video Research]

- Territories covered by research
 - Kanto and Kansai regions
- Research targets
 - VCR households among viewer rating survey households in each region (86.6% in the Kanto region as of April 30, 2005).
- Measurement methods
 - Online system incorporating a VCR sensor that automatically records VCR recording and playback data onto a viewer rating meter.
 - Can cover up to three VCRs per household.
- Measurement units
 - Recording: Measures program recording times by broadcast channel in units of seconds.
 - Playback: Measures entire playback times (including TV programs, commercially available software and self-generated tapes) in units of seconds.

* All information in this report was extracted from the April 2005 data for the Kanto region.

How Were VCRs Being Used?

Time spent watching VCR playbacks accounts for a mere 3% of total TV viewing hours.

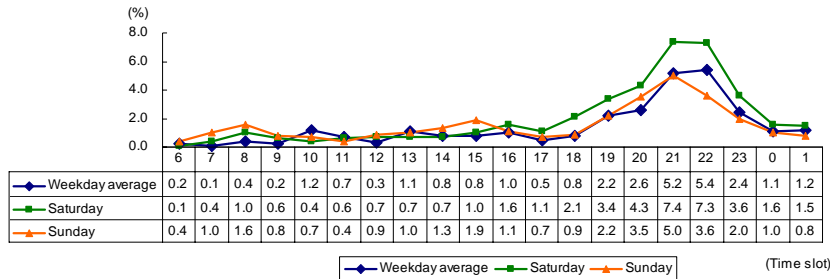
[Recording and Playback Timing]

- A comparison between recording and playback hours reveals that recording tends to be concentrated in prime time throughout the week. Playback times are less regular, although it appears that playback during daylight hours on weekends appears to be quite common.
- We can conclude, therefore, that recording is concentrated in the evening hours, when popular shows are prevalent, while playback is more likely to occur in daylight hours, which offer more flexibility.

[Comparison of Live Viewing and Playback Viewing]

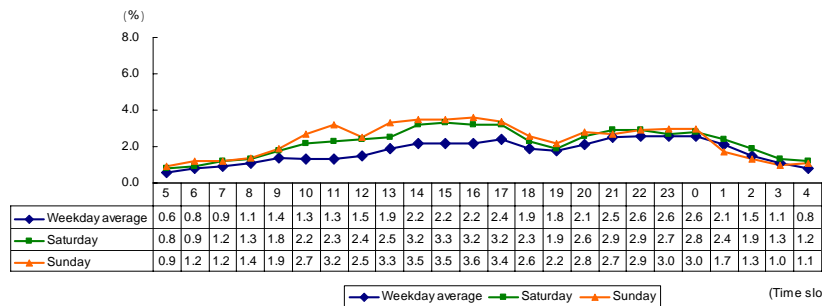
- Throughout the survey period (April 4–May 1, 2005), the average recording time as a percentage of total TV viewing time (6:00–24:00) in VCR households was 1.3%. The playback time figure was 1.7%.
- For reference purposes, according to People Meter data, households using television (HUT: the percentage of TV households with TV sets in use at one time within the survey area) for the same period was 44%. The percentage of the average playback rate to the total television viewing rate, factoring in the average playback rate to HUT, was 3.7%. Although we are unable to specify what types of content were played back, it is clear that time spent watching VCR playback as a percentage of total TV viewing time is very small.

[Average Recording Rate, by Time Slot (VCR Households)]



Home VCR Recording and Playback Ratio Report, Video Research, April 2005 (Kanto region)

[Average Playback Rate, by Time Slot (VCR Households)]

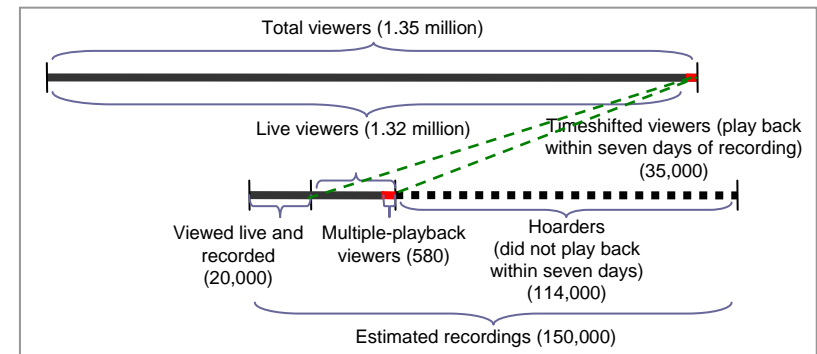


Home VCR Recording and Playback Ratio Report, Video Research, April 2005 (Kanto region)

[U.K. VCR Usage Trends]

- Dentsu’s analysis of U.K. viewer ratings shows that time spent watching playbacks accounted for only 2.6% of total TV viewing time (sum of programs watched in real time and those viewed within seven days of recording).
- Also, not all recorded programs were watched. In fact, our calculations show that only 23.6% of recorded programs are watched within seven days of recording.

[Average Viewers, All Programs (U.K.)]



(Dentsu, 2003, from analysis of BARB data)
 * Average of all programs of five terrestrial broadcasters, aired between February 3 and March 2, 2003
 * In the United Kingdom, live viewer and timeshifted viewer ratings (played back within seven days) are measured.

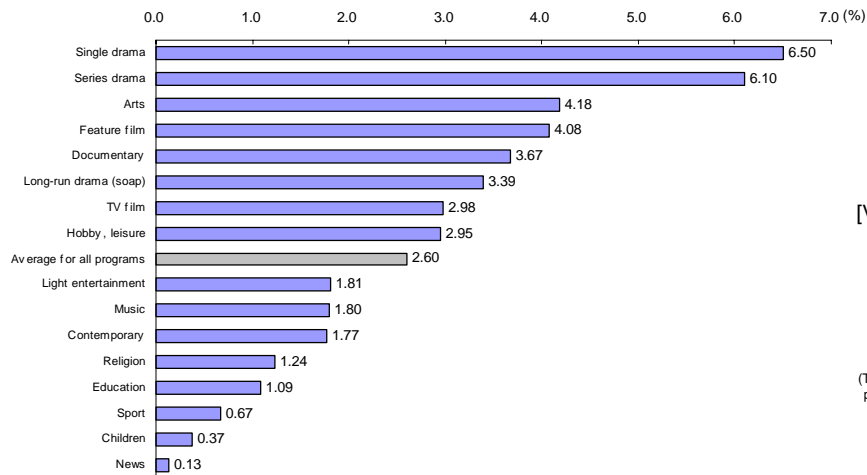
What is Being Recorded and When is it Being Played Back?

Recorded programs are usually watched within seven days. Dramas and movies are more conducive to playback viewing, whereas news and sports programs are easier to watch live.

[Playback Patterns by Program Genre]

- In the United Kingdom, VCR playback hours accounted for 2.6% of total TV viewing time. Of all programs broadcast during the survey period, dramas and movies occupied a high percentage of playback viewing.
- At the lower end of the playback scale were programs that are conducive to live viewing, such as news, children’s programs and live-broadcast sporting events.
- These trends appear to be universal, irrespective of country or recording medium (VCR or DVR). Other Dentsu research and existing reports confirm that Japan, the United States and the United Kingdom are largely identical in this regard.

[VCR Playback Viewer Ratings, by Program Genre (U.K.)]

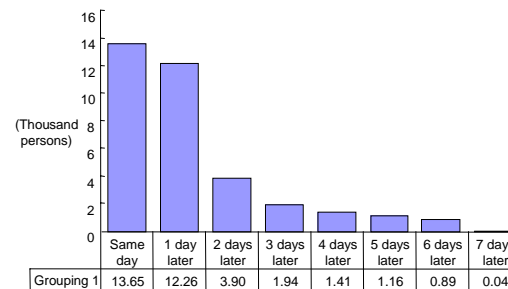


(Dentsu, 2003, from analysis of BARB viewer rating data)

[Playback Timing Patterns]

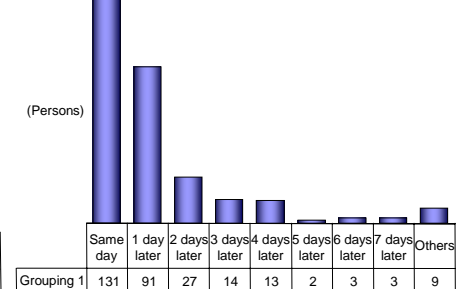
- When do people watch their recorded programs? Dentsu has analyzed VCR recording and playback data for programs broadcast during the U.K. survey period. Our findings show that recorded programs are played back mostly on the same day, or at least within seven days. The system does not contain records of programs kept for more than seven days, but it is highly likely that such programs are never watched.
- It is interesting to note that, when Japanese DVR users were asked when they played back programs recorded on DVR, their answers were almost identical to those of the U.K. respondents, as the graph below shows.
- Successive research indicates a common trend with respect to recorded content and playback timing that transcends nations and type of recording devices. This could suggest that, for example, people prefer to watch the most recent episode of a drama series before the following week’s episode is broadcast, or that they prefer to watch recorded programs on the same day before discussing them with their friends. Alternatively, it could indicate that they desire to watch all recorded programs on the weekend rather than wait for the following week. Regardless, it is clear that playback of recorded programs is concentrated in the period immediately after recording. Rather than archiving, people tend to prefer playing back recorded programs soon after the original broadcast.

[VCRs: Average Playback Pattern (All Programs) (U.K.)]



(Dentsu, 2003, from analysis of BARB viewer rating data)

[DVRs: Playback Pattern (Japan)]



(Joint research by Dentsu and Video Research, 2004)

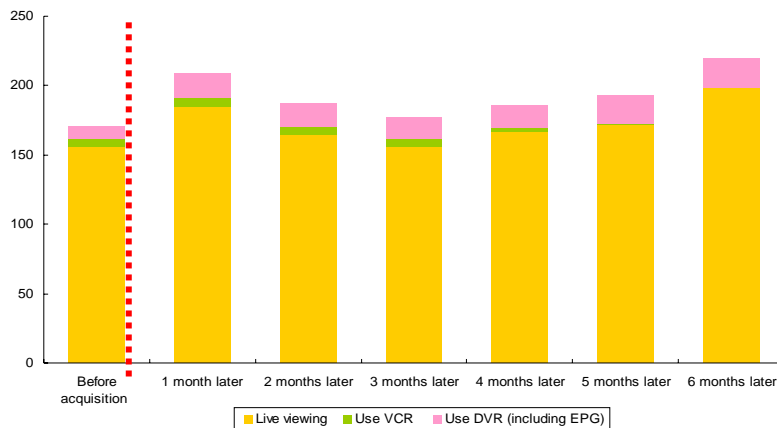
TV Viewing in DVR Households

DVR acquisition has served to boost total TV viewing, including live viewing.

[TV Interaction in U.K. DVR Households]

- To see how DVR acquisition affects TV viewing trends, we studied U.K. households that introduced Sky+, focusing on viewing time in the month prior to introduction compared with the six months following.
- The results show that timeshifted viewing of DVR-recorded programs did not erode live viewing. Rather, total average daily viewing time increased immediately after DVR acquisition, then settled down before picking up again in the fourth month after acquisition. Live viewing was up and down in the six months after DVR purchase, but there was no sharp decline from the level just prior to acquisition. In fact, our research shows that average live viewing hours six months after DVR acquisition were actually 12% higher than before.
- As the following page shows, live viewing accounted for the bulk of TV viewing time.
- Meanwhile, VCR usage hours declined over time, and it appears that the surveyed group had switched completely over to DVRs within five months.

[TV Viewing Hours Before/After DVR Acquisition]



Dentsu, 2004 (from analysis of BARB viewer rating data)

[Calculating DVR Playback Viewing Hours from BARB Data]

- The U.K. viewer rating system covers a sampling of around 5,100 households.* These include Sky+ subscribers, with hard disk-equipped STBs supplied by satellite broadcaster British Sky Broadcasting Group PLC (BSkyB). A category called “EPG usage” is included to gauge timeshifted viewing in those households. EPG usage in Sky+ households includes EPG usage for its original purpose, as well as for timeshifted viewing of programs accumulated in the hard disk.
- Average EPG usage for regular Sky subscriber households (without Sky+) is deducted from the EPG usage figure and the remainder is equivalent to timeshifted viewing time.

[Reasons Why DVR Acquisition Leads to Increased Live Viewing]

- We obtained full viewing histories for around 80 households, covering the full period from one month prior to acquisition to six months after purchase. Live viewing hours increased immediately after the acquisition. Households that introduced Sky+ at the same time as they became SkyDigital satellite subscribers had access to numerous channels for the first time, which we regard as the reason for increased TV viewing hours. However, the majority of our sample households were existing SkyDigital subscriber households, who already had access to numerous channels.
- From this, we can conclude that the DVR enables users to more effectively control viewing hours, thus increasing opportunities to watch programs in real time that they were previously unable to watch.

* As of September 2004, approximately 430,000 U.K. households had DVRs, of which approximately 350,000 were Sky+ subscribers.

Comparison between Live and Timeshifted Viewing Time in DVR Households

Live viewing accounts for 88% of total TV viewing time in DVR households.

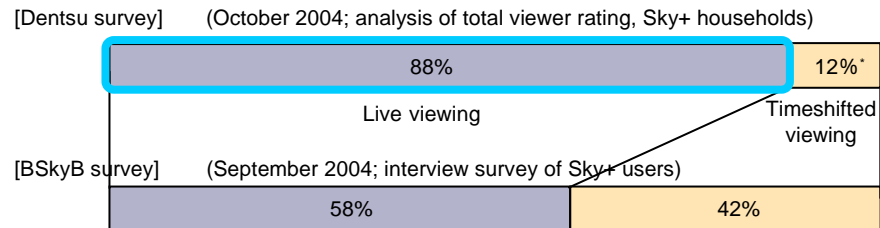
[Live Viewing Compared with Timeshifted Viewing]

- Using the same viewer rating data from the United Kingdom, we calculated the live and timeshifted viewing times of DVR households as percentages of total TV viewing hours for the month of October 2004.
- Our results show that live viewing accounted for an average of 88% of total TV viewing in DVR households, while timeshifted viewing, including EPG usage, occupied 12%. We were able to confirm that live viewing increased in the same households as a result of their DVR acquisition. In other words, rather than causing a decline in live viewing, DVRs actually encourage more live viewing.
- Even in Sky+ households, where live programs are watched via STBs equipped with an automatic recording function, we found a similarly high proportion of live viewing. In Japanese DVR households, where essentially a button must be pressed to start recording, we estimate that the level is the same, if not higher.

[Issues Related to Survey Method]

- BSkyB announced the results of a survey conducted at the time, undertaken for the same purpose. BSkyB's research showed that live viewing and timeshifted viewing accounted for 58% and 42%, respectively, of total TV viewing by Sky+ users.
- We attribute the huge discrepancy in the two sets of research results to the methods used to conduct the surveys. In the BSkyB case, face-to-face interviews were held with Sky+ users. It is natural, therefore, that subjective opinions of respondents greatly influenced the outcome. If we remember that much live viewing is deeply ingrained in people's lifestyles, when asked about their level of timeshifted viewing, respondents naturally emphasized their timeshifted viewing patterns to a certain extent.
- When reading various reports, one should be aware that different survey methods will produce different results, even if the subjects of the survey are the same.

[Breakdown of TV Viewing among DVR Owners]



* "Timeshifted viewing" figures include EPG usage.

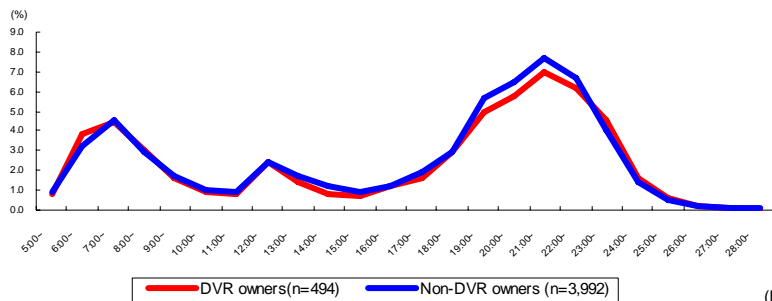
Live Viewing in Japanese DVR Households

In Japan, DVR households on average spend 93.4% of the time non-DVR households spend on live viewing on weekdays and 94.8% on weekends (commercial channels only).

["Every Hour" Live Viewing]

- We've seen the results in the United Kingdom, but what about Japan? Ideally, to gain an understanding of the impact of DVRs, we must ascertain how DVR acquisition changes same-household TV viewing patterns. For its domestic survey, however, Dentsu split its own research panel into two groups—DVR owners and non-DVR owners—and compared the TV viewing patterns of each (commercial channels only).
- The results of our research show that live TV viewing throughout the day by DVR owners is about the same level as that of non-DVR owners, although live viewing times by DVR owners tends to fall slightly during prime time. But the difference is not 40%–50%, as is widely claimed. Assuming live viewing hours between 6:00 and 24:00 in non-DVR households to be 100%, live viewing hours in DVR households was 93.4% on weekdays and 94.8% on weekends.
- Determining the reasons for the discrepancy will require more detailed research. Does the difference in live viewing hours between the two groups stem from the playback time spent by DVR households, or from the specific attributes of DVR owners? Perhaps timeshifted viewing eroded live viewing hours, or perhaps DVR owners—because, for example, they actively use other media—were not sitting in front of the TV.
- In any case, given that DVRs are found in approximately 15% of Japanese households, the aforementioned discrepancy should only have minimal effect on the TV advertising business at present.

[Live Viewing Situation (Commercial Channels Only; Weekdays)]

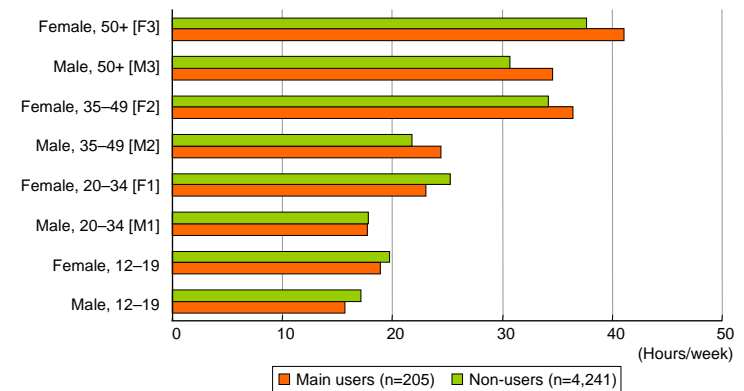


(Dentsu, 2005)

[Generation-Specific Analysis]

- We analyzed live TV viewing hours of different generations among DVR owners who claim that their DVRs are “highly relevant,” that is, those who primarily use their DVRs.
- The results show that DVR owners aged 35 and over have longer live viewing hours than non-DVR owners. In the 12–34 age group, DVR owners watch less live TV than non-DVR owners.
- Judging from these results, we may conclude that younger people are more familiar with DVRs and more amenable to timeshifting their TV programs, whereas the 35–59 age group were already TV lovers and had simply acquired a DVR before other people.
- As in the case of “every hour” live viewing patterns, however, we cannot discount the possibility that the attributes of DVR owners have had an influence, particularly on data for the younger generation. Since we cannot confirm TV viewing patterns prior to DVR acquisition, it is probably best to suppress any judgment that a decline in live viewing hours could be directly attributable to DVR use.

[Live Viewing Hours, by Age Group]



(Dentsu, 2005)

Image of DVR Users

DVR users are sensitive to information and generally have a favorable view of commercials.

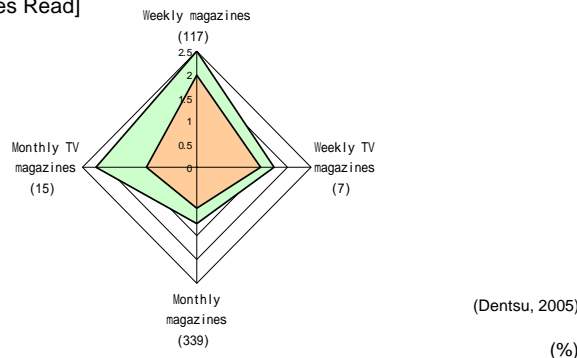
[High Sensitivity to Information]

- What kinds of people acquired DVRs before others? According to original Dentsu research, DVR users are not the typical “early adapters” (active embracers of the latest technologies), but rather people who have a high sensitivity to information.
- These people tend, for example, to view advertising in a relatively favorable light, and are heavy readers of newspapers and magazines. It is worth noting the high level of TV information magazine readership among DVR owners. This probably indicates that DVR ownership has made them more interested in TV.
- Once DVRs have proliferated widely because of people upgrading from VCRs, these user attributes may not necessarily be sustained.

[Commercial Awareness]

- It is easy to conclude that commercial awareness among DVR owners would decline because they are more inclined to record programs and fast-forward commercials as they replay. According to our commercial awareness survey, however, DVR owners have higher commercial awareness rates than non-DVR owners in practically all cases studied.
- This can be attributable to the unique characteristics of DVR users (high information sensitivity or basic love of TV, for example). At this stage, therefore, we do not believe that the DVR in its present state will cause a decline in the effectiveness of commercials. Rather, DVR users may present an efficient target group for advertisers, because they are more receptive to commercial messages.

[Average Number of Magazines Read]

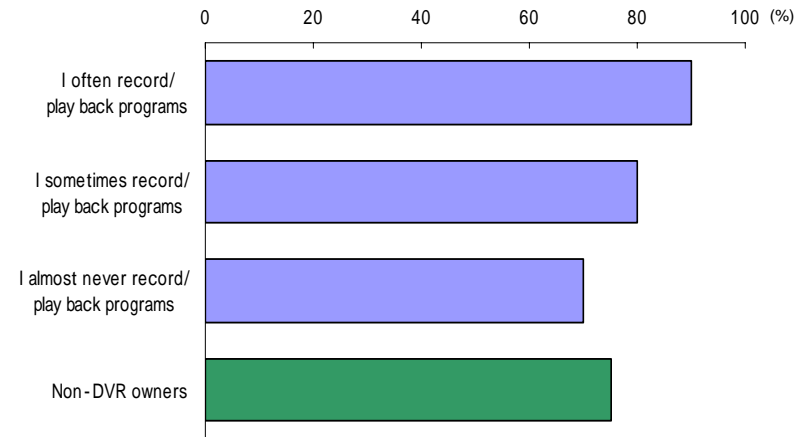


[Awareness of Advertising]

| | Homeowner (n=509) | Not Homeowner (n=4,109) |
|---|-------------------|-------------------------|
| I think ads reflect the times | 66.2 | 62.9 |
| I get useful lifestyle information from ads | 67.2 | 62.7 |
| I want to see topical TV commercials | 57.0 | 50.5 |
| I mention ads I've seen in regular conversation | 55.0 | 51.7 |
| I look out for products in ads that interest me | 76.2 | 72.4 |
| I feel familiar with products in TV commercials | 36.0 | 32.9 |

(Dentsu, 2005)

[Typical Commercial Awareness Scenario]



(Dentsu, 2005)

Relationship between Timeshifted Viewing and TV Viewer Ratings

Unlike in the United States and the United Kingdom, in Japan only live viewing is subject to the current TV audience measurement system.

- As a prerequisite to studying the impact on the present TV advertising business of changes in TV viewing patterns caused by the DVR, we must first gain an accurate understanding of viewer rating survey methods, which function as the backbone, or the currency, of the broadcasting business.

[Japan]

- Viewer ratings, which serve as the basic infrastructure of the Japanese advertising business, only measure live viewing. Because recording devices are not covered, timeshifted viewing is not taken into account.
 - According to Video Research, “viewer ratings” only cover the percentage of programs or information broadcast by TV stations that are viewed at the same time as they are broadcast, irrespective of the type of broadcast (terrestrial or satellite, cable or wireless).
- What about overseas? In the United States and the United Kingdom, the penetration of DVRs has prompted reviews of the definition of viewer ratings and TV audience measurement systems. This is because program recording and playback patterns have been included in viewer rating surveys in these countries since the VCR age. The situation in these countries, therefore, is much different from that in Japan.

[United Kingdom]

- In the United Kingdom, watching recorded programs within one week (164 hours) of broadcast is called “timeshifted viewing.” This is added to the regular “live viewing” figure to form a “consolidated viewing” figure.
- Essentially, the same principle applies to DVRs, but BARB, a research body, is promoting a new concept, called VOSDAL (viewing on the same day as live). The industry is still in the process of making necessary adjustments, but BARB hopes to provide VOSDAL data for DVRs by the end of 2005.

[United States]

- In the United States, Nielsen Media Research, Inc., has traditionally included VCR-recorded programs in its viewer rating measurements, whether or not such programs are ever played back.
- To date, Nielsen has not included DVR households in its People Meter system, although it is now starting to do so in an effort to address the impact of the increasing penetration of DVRs.
- As in the United Kingdom, Nielsen is proposing a three-way classification for defining viewership: live viewing, playback viewing within seven days and same-day playback viewing. Nielsen plans to begin submitting data in January 2006, but initial information will be inherently contradictory in terms of defining parameters (measurements of recording ratios for VCRs and playback ratios for DVRs, for example). For this reason, we expect discussions to continue within the industry about how surveys are conducted.

Relationship between Timeshifted Viewing and TV Viewer Ratings

[Viewer Rating Research (Japan, United States, United Kingdom)]

| | | Japan | United States | United Kingdom |
|------------------|-------------------------|-----------------------------|---|--|
| Research company | | Video Research | Nielsen Media Research | BARB (commissioned by AGB-NMR) |
| VCR | Recording measured? | Yes (by program unit) | Yes | Yes |
| | Playback measured? | No (only hours played back) | No | Yes (if played back within 164 hours of recording) |
| | Added to viewer rating? | Not added to viewer ratings | Added to viewer ratings even if recorded programs not played back | Programs played back (within 164 hours of recording) added to viewer ratings |



| | | | |
|---------------|---|---|--|
| DVR measured? | <ul style="list-style-type: none"> ■ DVR households included in panel ■ Only live viewers covered in viewer ratings | <ul style="list-style-type: none"> ■ At present, DVR households excluded from panel ■ Proposing three groupings for viewer rating purposes: Live, Same Day (same-day playback), and Live Plus (playback within seven days) ■ Planning to start measuring DVR playback in January 2006 ■ Many problems (discrepancy between DVR models, need for cooperation from broadcasters regarding encoding, etc.) | <ul style="list-style-type: none"> ■ DVR households included in panel ■ Proposing DVR response similar to basic VCR rule (Consolidated viewing = Live viewing + Playback within seven days) ■ Promoting VOSDAL (viewing on the same day as live) concept ■ Planning to publish data by end of 2005 |
|---------------|---|---|--|

Media Consumption and the Reach of Television

The overwhelming “reach power” of the TV medium has not changed.

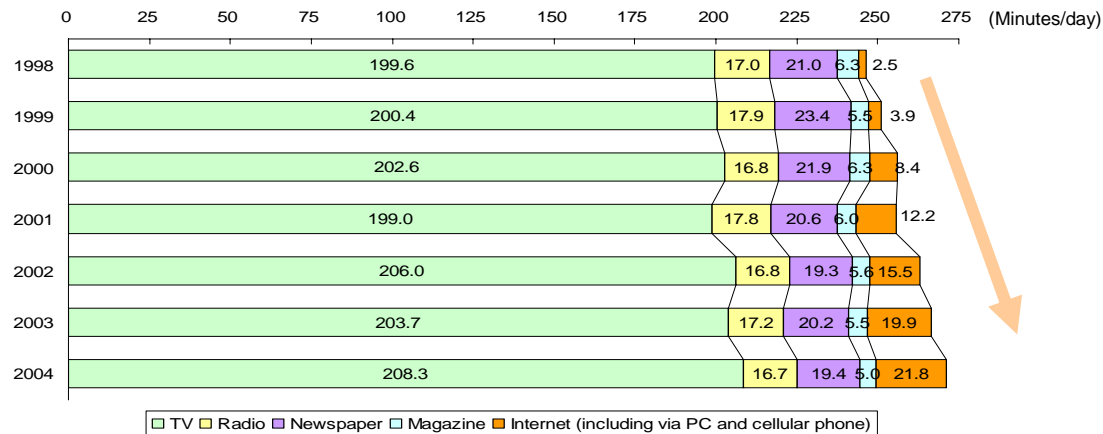
[Media Consumption]

- A look at media consumption trends in the home over the past seven years shows that, while Internet use is expanding at a tremendous rate, TV viewing has also increased over the years.
 - From 1998 to 2004, average daily TV viewing hours in Japan grew by 8.7 minutes, to 208.3 minutes (approximately 3.5 hours).
- The fact that TV viewing times are rising despite limited hours in the day indicates that “simultaneous media consumption” (using the Internet or a cellular phone while watching TV, for example) is becoming the norm.

[Overwhelming Reach of TV]

- The TV is capable of delivering information simultaneously to numerous people. The superb content production and programming skills of TV stations account for TV’s value as a medium. These features cannot be found in other media.
- The Internet and other, diverse media forms will continue to proliferate. In this context, if TV is regarded as a portal for transmitting information to many people simultaneously, then connecting TVs with PCs, the Internet and cellular phones will enhance interactivity and unleash new levels of value.
- In the future, we expect new initiatives to emerge that focus on TV’s potential as a portal device.

[Media Consumption Trends]



(Media Contact Reports, Video Research)

DVRs and the TV Advertising Business

DVRs in Japan have not had an impact on the TV advertising business, due to its different audience measurement systems.

- Numerous overseas research reports produced by market research companies and securities analysts claim that the DVR penetration will result all programs being recorded, and that people will skip the commercials while playing back the recorded programs. According to such reports, this will sharply reduce the effectiveness of commercials.
- In contrast, as mentioned earlier, the mainstream DVR format overseas comes in the form of a hard disk-equipped STB, which satellite and cable broadcasters supply to subscribers. This format encourages users who watch programs via the STB to use the follow-up replay and other recording/playback functions while watching live programs.
- Growth in the Japanese DVR market has been propelled by home electronic appliance manufacturers, who sell DVRs to consumers directly via electronics retailers. The DVRs themselves are not reliant on any particular broadcasting platform. To enhance customer convenience, DVR makers include various functions as standard on the remote control that could reduce the effectiveness of commercials. Notable among these is the commercial-skip function. This could make conditions difficult for the TV advertising industry in Japan.
- As we have stated, however, in Japan only live viewing is subject to the current TV audience measurement system. Recording—not only using a DVR—while away or watching another program and viewing of recorded programs are not included in viewer ratings. Moreover, the panel used in Japan to measure viewer ratings includes households with DVRs. Accordingly, changes to live viewing caused by DVR usage are reflected in viewer rating trends.
- In contrast, in the United States recorded programs are included in viewer ratings regardless of whether they are actually played back. Therefore, even programs that are never watched are reflected. Because only live viewing is subject to audience measurement in Japan, programs that are not watched in real time are not reflected in viewer ratings. Because the definitions of viewer ratings in the United States and Japan are different, it is a mistake to assume that the effects of DVRs in the two countries will be the same.
- Dentsu's research confirms that DVR acquisition leads to increases in live viewing. Moreover, commercial awareness rates are higher among DVR owners than non-DVR owners. After conducting a series of surveys, we can conclude that at this point in time DVRs provide increased opportunities for TV viewing.

“Impact of DVRs on TV Viewing in Japan”

July 19, 2005

Research & Development Department
Media & Contents Strategy Planning Division
Dentsu Inc.

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