Digital TV Transition and the Hard Disk Drive Revolution in Television Viewing

MIKAEL ANDERS WAHLSTRÖM[1]

ANU KANKAINEN

Helsinki Institute for Information Technology HIIT

The conversion to digital television broadcasting is taking place in various countries. The shutdown of analog transmission requires the consumer to purchase either a new television set or a conversion device. In Finland, many converter boxes are equipped with a hard disk drive (HDD). Using interview data and freely available statistics, this study explores this phenomenon and consequent changes in television viewing. Some viewers watched most programs from the HDD and hence reported nonexposure to TV advertisements. Reasons for nonpreference for post-broadcast viewing of programming from the HDD are considered, and comparisons are drawn with the practice of watching shows from a PC or DVD. Also discussed is that, regardless of the reduced communication power of conventional advertisements, the television industry might benefit from viewers' increased options.

Finland shut down analog terrestrial television transmissions nationwide in September 2007 (Finnish Ministry of Transport and Communications, 2006), taking part in a larger digital television switchover that is occurring in Europe, the Americas, Australasia, East Asia, and South Africa (Starks, 2010). The United States completed the transition in June 2009 (U.S. Department of Commerce, 2007). With the transition, the common analog television set no longer functions without a digital television converter box or something similar. As it happens, in Finland, many converter devices or boxes are equipped with a hard disk drive (HDD) that enables easy storage of transmitted broadcasts—the converter box includes a digital video recorder. This, in turn, results in changes in television viewing. To the best of our knowledge, this has not been studied in the existing communication research literature.

Mikael Anders Wahlström: mikael.wahlstrom@hiit.fi

Anu Kankainen: anu.kankainen@hiit.fi

Date submitted: 2010–11–08

The HDD provides a relatively effortless means to time-shift shows by recording them and watching them afterwards, and it allows individuals to skip over or fast-forward through broadcast advertisements. In other words, the HDDs liberate individuals to view shows at the most suitable time, and they diminish advertisers' capabilities to promote via television. Therefore, the use of this device should be considered in discussions of how new communication technologies promote individual agency and change societal communication power structures. Castells (2007) notes that we have gone through a historical shift in the ways different actors may induce social change: The Internet and cellular phones provide new opportunities to distribute and broadcast news content horizontally (that is, without the traditional gatekeepers of mass communication, government- or business-controlled media outlets). The use of HDDs in television watching points to additional types of interplay between technological change and the power to communicate: Because of nonexposure to advertisements, common people are less influenced by actors with commercial or political agendas who promote by means of television. It is therefore relevant to describe and explore the use of HDD converter boxes, which is the aim of this article.

To gain an overall sense of HDD-based television viewing and its features, one should consider why people watch shows live, since this type of broadcast has clear potential to not be subject to HDD use. It is common for programs to be marketed as live broadcasts; that is, one would suppose that watching live provides some added value for the viewers. Additionally, in this article, HDD-equipped television will be compared to other means of watching recorded shows, namely via PC or DVDs. The comparison to PCs is necessary to develop an overall understanding of the use of HDD-equipped television, because many households have a PC in addition to a television set, and previous research (Ferguson, 2000; Haridakis & Hanson, 2009) has found that the Web may function as a substitute by fulfilling similar needs as television. Although Internet use is solitary in comparison to television (Ofcom, 2008), viewing Web-browser–based videos is, like television watching, motivated by co-viewing—that is, by experiencing the videos alongside others (Haridakis & Hanson, 2009). The comparison to DVD use is relevant because, since the HDDs provide huge libraries of shows, it remains to be understood why owners of HDD recorders would rent DVDs.

In sum, the purpose of this article is to answer the following three interconnected research questions: 1) How can we describe and explain the change that the digital television conversion has wrought in individuals' television-viewing habits through the use of HDDs? 2) What are the reasons for watching shows live instead of as recordings? and 3) How does using an HDD-equipped television compare to renting DVDs or using a PC (when it comes to viewing video material)?

The inspiration to explore these questions stems from an interview-based study in which current social practices associated with broadcasting and videos in different forms were explored in general terms: The change provided by the HDD converters was a distinctive and surprising finding. In addition to the interview data, we use freely available statistical information and rely on quantitative studies of media use carried out by others for statistical assessment of the phenomena noted. Additionally, we use social psychological theoretical formulations, such as cultural scripts (Triandis, Lisansky, Marin, & Betancourt, 1984), social identity (Tajfel, 1978), and cognitive dissonance (Festinger, 1957), to provide theoretical explanations concerning the research questions.

Methods: Data Synthesis and Interviews

Methodologically, this study follows the idea of data synthesis, i.e., the combination of several data sources that individually provide incomplete findings but, when viewed together, present a convincing whole (Matusov, 2007). The study applies the data synthesis approach by examining an interview data set, collected by the first author of this article, in conjunction with public statistics and publications that rely on statistical data. In other words, phenomena and notions expressed by interviewees are assessed statistically, in order to provide supporting data that allow generalizing and evaluation of the scope of the phenomena at hand. The Finnish statistics used are from Statistics Finland's *Consumer Survey* and *TV Audience Measurement*, both conducted by Finnpanel, the company that measures television and radio use in Finland. Both sets of statistics are collected four times a year, with the former involving random samples of about 1,500 people (Statistics Finland, n.d.), while the sample size for the latter is 3,000 (Finnpanel, n.d.).

The qualitative data set was based on interviews with 30 people recruited by a commercial research company with predetermined recruitment criteria aimed at heterogeneity in terms of age, family situation, and geographical location in the Helsinki metropolitan area. The oldest interviewees had already retired from working life, and the youngest were 13-year-olds, with the mean age being 37 years. Some interviewees were from households with children (13 people, from five different households). Parents were interviewed together, and, in families with teenagers, each teenager was interviewed alone. Five of the interviewees lived with a partner in households without children. Four of these (two couples) were interviewed with their partners, and one cohabiting individual was interviewed alone. The remaining 12 interviewees lived alone or with roommates. In total, 20 households were examined. Five of the interviewees were exchange students from the United States, Iran, Poland, and (two individuals) China.

The data-collection was conducted to explore, in general terms, current social practices associated with any type of broadcasting and videos in different forms (including DVD, VHS, television broadcasting, and Internet videos, plus other broadcasts and mobile video, but not games and movie-theater visits). That is, the interviews were not conducted solely for studying use of HDD converter boxes. In this data set, all interviewees used a PC, and 15 individuals lived in a household with an HDD converter box. Seven people living alone did not have a television set at all. All families with pre-high-school-age children (four households, 10 interviewees), three cohabiting interviewees, and two individuals without a partner or spouse had an HDD converter device. We used data from those interviewees who did not have an HDD converter box to explore PC use, video rental, and the watching of live programs.

The participants were interviewed in the everyday environments where they consumed videos and/or broadcasts—usually at home and, in a few cases, in a cafeteria they regularly visit. It was assumed that the natural surroundings would help the interviewees to recall better how they use the various devices. The interviews were conducted in the fall of 2009.

The interviews were semi-structured. Interviewees were prompted to talk freely about the following issues, which were systematically covered in all interviews:

- Types of video or broadcasting content viewed with various devices
- Watching television with others and alone
- Watching video content via the Internet with others and alone
- Sharing video content with others via different devices
- Comparing different devices and Internet services

Typically, the interviews progressed so the discussion looked first at television and the HDD converter box, then the DVD player, then the Internet, and finally other possible devices. The interviewees were consistently asked to explain why and how they used a certain device in a certain manner. The interviews aimed to discover and understand different types of habits and cases; that is, the interview questions varied considerably among study participants, depending on the topics introduced by those being interviewed. The interview sessions lasted roughly from 45 minutes to two hours. Finnish people were interviewed in Finnish, while exchange students were interviewed in English. One-third of the interviews were transcribed in full, these being the interviews conducted first. The interview data analysis involved pinpointing different ways of using the previously mentioned devices and individuals' explanations regarding these practices. This annotation was done by hand for the transcriptions and with ELAN, a tool for annotating video and sound materials directly in the media files (Brugman & Russel, 2004; Language Archiving Technology, 2008).

The Prevalence of HDD Converter Boxes

The digital television conversion has changed television-viewing habits through the inclusion of HDDs in digital converter boxes. HDD devices enable easier recording of television programs than VHS tapes do. Only broadcasts of limited length may be recorded on a VHS cassette, whereas an HDD may contain several hours of programming. Also, HDD converter boxes offer more sophisticated user interfaces: lists of upcoming programs are presented on the TV screen, and a click or two selects among these for recording to the HDD. Additionally, the VHS user has to buy the cassettes, while the HDD avoids this extra expense and doesn't involve a trip to the store.

Digital video recorders were available for TV before the digital television conversion, but in Finland these have become less common than HDD converter boxes. At the end of 2006, about 12% of households had an HDD in a digital converter, presumably for recording chargeable satellite or cable TV content, whereas in 2007, at the time of the conversion, the prevalence of these devices had risen to 28%. Recording DVD players (DVD-R) may also be used for digital recording of TV programs, and at the start of 2007 17% of Finnish households had one for TV use. Their prevalence remained roughly the same in 2007 and 2008. More recent statistics do not differentiate between HDD- and DVD-R-equipped converters, which is understandable, since the same device may include both features. At the end of 2008, 38% of households had an HDD digital converter, and in mid-2010 45% had an HDD and/or DVD-R digital converter. All of these statistics are drawn from Statistics Finland's Consumer Survey (2010). Although the statistics cover a variety of devices, they do not include digital video recorders for television that are not also converter boxes. This is probably because only a few individuals have these in Finland.

Though the prevalence of digital video recorders might have increased even without the digital television conversion, it is very likely that the conversion has increased their prevalence. Because of the digital television conversion, households have been forced to buy a converter or a new television set if they wish to watch regular television broadcasts. Having to buy new entertainment equipment in any case, consumers may also have taken the opportunity to consider the different technological options the boxes offered. The conversion has most likely also stimulated the market for converter boxes, thus providing a competitively priced selection of different options.

Changes in Habits Due to HDD Converter Boxes

The HDD had considerably changed the way in which our interviewees watched television. Four families with small children were studied, and in all of these families the parents explained that almost all programs were watched from the HDD—therefore, not when they were broadcast. One couple brought time-shifting into the discussion at the very beginning of the interview:

Interviewer: I will first ask a sort of warm-up question. How would you describe yourselves as television viewers?

Man: What kind of television viewers are we? We watch quite a lot, quite selectively.

Woman: Mostly nowadays, when we watch television, we watch recorded shows. Very seldom do we watch anymore when the show comes [on].

Combining work and family, both parents in the families interviewed were paid workers and therefore had a very limited amount of leisure time. For example, in one family, the parents described having one hour of personal time per weekday, "from 9 to 10," that could be used for watching television without their children. Thus, the families had very few possibilities for adjusting their timetables to TV channels' broadcasting schedules. Among less hurried interviewees, the change was not so drastic. A pensioner couple said that the HDD was used mainly for recording broadcasts during weekend trips, and a student estimated that roughly half of the programs he watched were viewed from the HDD. This is in line with statistics that indicate that time-shifted viewing is, in proportional terms, most common among young and early middle-aged adults (persons aged 25 to 45) in households with a recording converter box (Finnpanel, 2009). In other words, the increased prevalence of time-shifting could be associated with the time management challenges that come with raising children. The increased freedom provided by the HDD converter box was emphasized by an interviewee in the following way: "A recording converter box liberates [me] from the chains of the broadcasting company."

According to Finnpanel (2009), 87% of television broadcasts in 2009 were watched live among those who owned an HDD converter. Of the 13% watched later from an HDD converter, 5% were watched on the day of broadcast and 7% within one to seven days of the original broadcast. These statistics portray somewhat fewer changes in television-watching habits than do the interview results just described. It is possible that the use of the HDD varies greatly among households and that our small sample, which is not representative of the general population, happened to include individuals who use the device very frequently.

However, the methods used by Finnpanel also hide somewhat the actual prevalence of HDD use. In Finnpanel's (n.d.) method, an individual is instructed to report being a television viewer when he or she is both (1) in the same room as a television set that is turned on and (2) able to watch the television. Therefore, even a person who is not actually watching the television should be noted as a television viewer. This type of passive mere presence with a TV set turned on is likely to be less prevalent where recorded programs are concerned, because the playing of recordings is preceded by the slight effort of choosing the shows. Thus, the 13% of viewing that is time-shifted would include more active watching than the 87% of non-time-shifted watching. Additionally, the Finnpanel measurement of watching recorded shows does not include programs viewed more than seven days after their initial broadcast. In Finnpanel's (2009) statistics, most recorded shows were watched soon after broadcast (81% within the next two days after the broadcast) and less than 0.5% of recordings were watched on the seventh day. One could presume from this that few shows are watched more than a week after broadcast; however, an alternative interpretation is that, although most of those shows that are watched within one week of broadcast are watched quite soon, there might still be a considerable number that are watched long after broadcast.

The immediate outcome of HDD-based television watching is that advertisements are no longer watched, since they may be fast-forwarded through or skipped over. One interviewee said that he had learned to estimate the length of commercial breaks, which enabled directly jumping over them with the HDD user interface. To exemplify the scope of the change for some individuals, one may refer to an interviewee, a high school teacher, who regretted no longer knowing what kinds of advertisements were being broadcast, since in her profession being familiar with them would be useful all-around knowledge.

> And one notices that one does not any longer know, does not remember advertisements, and because of my work one should know them a bit. Well, so I just notice, when I go and watch something like the best of advertisements, like from the Internet, so that I can use them in lectures, so, then I am—so, I do not know any of these advertisements that have won the Best of the Year awards.

Being able to fast-forward also allowed the practice of browsing through television programs. Two interviewees, hurried mothers of small children, stated that at times they watched subtitled programs at double speed. Apparently they, two well-educated professionals, were able to follow the shows by reading the subtitles, even at that speed. Additionally, some interviewees fast-forwarded through past sporting events by checking out the goals or points, because, since they knew the results, watching the whole game did not seem reasonable or entertaining. Though this type of fast-forwarding is, of course, also possible with a VHS device, it has become more prevalent because the HDD brings forth a routine habit of saving television programs. Watching programs quickly was also mentioned as a way to efficiently increase storage space: the viewers could delete the program from the HDD after watching it at double speed.

Indeed, other behavioral changes prompted by the HDD converter box were associated with choosing upcoming programs to be saved and deleting existing ones. Social practices typically associated with television include watching alongside family and friends (e.g., Haridakis, 2002; Rubin, 1983) and

post-viewing discussions of the shows (Levy & Windahl, 1984). The HDD adds new elements to social interactions, as family members discuss saving upcoming shows. For example, for some couples the use of the HDD converter box was the responsibility of the husband—that is, the wife demanded that the husband save the shows according to her preference. This gendered use of a recording device is in line with findings suggesting that VHS recorders have been used somewhat more commonly by men than by women (Hellman, 1996), but it is in slight contrast to results that indicate that the proportion of women watching time-shifted content from an HDD converter box is slightly higher than that of men (14% and 11%, respectively) (Finnpanel, 2009). However, family members also recorded upcoming shows for each other without any negotiation, since they were aware of what kind of shows would be of interest. For example, parents routinely saved children's shows. Additionally, there were negotiations about deletion of shows. For example, one family had the practice of deleting the oldest shows from the HDD as it filled up, but at times this method was subject to compromise, as family members indicated certain shows that ought not to be deleted. A male interviewee assumed that the question of deleting shows is a common one among his friends and relatives.

> This is, like, extremely amusing in these converter boxes that when I have compared friends' and relatives' recording converter boxes, irrespective of the size of the hard disk drive, the free space, the leeway is the same. It is some 20 megs or whatever it might be, or with what information they go. And even if they had bought a bigger converter box than this here.

In a certain sense, the digital TV transition has changed very little in terms of technology: digital recording of broadcast programs did exist before the transition, and the very common VHS system enabled the saving of shows just as the digital systems do. So why has the digital transition induced changes in television-watching habits despite the seeming superficiality of the change in technology? Three points may be noted. First, prior research indicates that people watch television both to gain information and for entertainment, but mainly for the latter reason (Rubin, 1984). Second, it may be postulated that the notion of entertainment including a burden is an oxymoron—at least if great enthusiasm is not associated with that entertainment. Third, as a consequence of these two factors, habits associated with television watching have to be easy and should not include a burden if they are to become widely and commonly practiced. Thus, it is *effortlessness* that explains why the digital television conversion changes habits of television watching. This is in line with much-studied technology acceptance models, in which perceived ease of use has been a central variable in statistically predicting whether or not an individual uses an innovation (Venkatesh, Morris, Davis, & Davis, 2003). The importance of effortlessness in television-watching habits is also very concretely illustrated by the practices of one of the interviewees. He did not use the converter box for saving particular children's shows, because those shows were presented and differentiated as a long list of five-minute sequences. Selecting shows from this long list was too much of an effort:

> So, mostly, the children's shows are like five-minute clips, such that there are an awful lot of them, so, then, you do not want to have the effort of, that is, browsing.

Overall, regarding the changes brought about by the digital transition, it may be concluded that since the conversion required viewers to purchase a converter box, it was not much additional effort to consider a technological option that provides digital recording. Because HDD converter boxes have greater usability than the VHS system, it is relatively easy to save upcoming programming routinely and very frequently.

Watching Programs Live

Some program types were generally watched at the time of broadcast. In Finnpanel's statistics, the proportions by genre for time-shifted watching were as follows:

Foreign fiction series	24%
Domestic fiction series	18%
Movies	18%
Children's television series	16%
Educational and scientific TV series	15%
Entertainment and reality shows	13%
Documentaries, journalistic TV series, culture/lifestyle programming	11%
Sports	3%
Current affairs	2%
News	1%

(Sandell & Lamberg, 2010)

It is understandable that news and current affairs series are seldom time-shifted, since they do not formulate a continuous narrative from one viewing episode to the next as fiction series or sports do, and, hence, time-shifting for the purpose of following a continuing storyline is not necessary. News is obviously also no longer news if watched very much later. By contrast, children's shows are time-shifted quite commonly, perhaps because the capability of pacifying children with TV flexibly, as necessary, can be valuable in everyday life.

In the interviews, roughly in line with the statistics just noted, interviewees mentioned sports, song contests, popular reality TV shows, and national celebrations (which fall into the category of "current affairs series" in the statistics) as programs that it was not ideal to watch afterward from the HDD. It may be postulated that any type of event that has collective cultural significance might be preferably watched live. These events may be long-established traditions (such as major sports events) or fairly new phenomena hyped in the media (such as popular reality shows). The interviewees provided some explanations. First, for sporting events, viewers lost the excitement of the event if they knew the results beforehand. Second, watching an important event simultaneously with others, even when the others weren't physically present, produced an experience that could be interpreted as a kind of feeling of togetherness. One middle-aged man explained this in the following way:

It happens right now and you are taking part in it. [. . .] Well, in that atmosphere, now moment, you are taking part in it and you know that millions of others are also, so it is somehow a nice feeling.

Similarly, some interviewees noted that they preferred to view sports live even if they did not know the result of the game. This preference can be explained by considering connections between emotions and social identity. The term "social identity" refers to the part of an individual's self-concept deriving from the individual's knowledge of his or her social group membership (Tajfel, 1978, p. 63). Social identity has been associated with television program viewing choices, because people like to choose shows featuring members of their in-groups (Harwood, 1999). Implications concerning the group an individual identifies with may affect emotions. For example, it has been found that emotional response to losses and wins when one is viewing sports events depends on the viewer's level of identification with the in-group—that is, with the supported team in question (Crisp, Heuston, Farr, & Turner, 2007). When one watches a game afterwards, the other members of the in-group have already experienced a win or a loss and the feelings associated with it. Therefore, when one watches an event from the HDD, its implications are less significant for the in-group, because past experiences are likely to have less emotional importance than current ones do. This, in turn, means that the events are also less important for the individual who identifies with the in-group. Thus, watching a game later inhibits experiencing emotions that may be associated with the event. In other words, to be able to experience emotions with the in-group fully, one would have to watch the event live.

In general, the intergroup emotion theory argues that when people define themselves as group members, emotions associated with the implications for the group (such as sadness due to losing) dictate people's tendency or desire to take action relevant for the group (Mackie, Silver, & Smith, 2004). These types of actions are also to some extent inhibited if the shows are watched later. Though commenting or cheering while one is watching a game on television does not actually influence the athletes' performance, these actions are nevertheless in support of the athletes. It makes little sense to express support for athletes when viewing events that have already been actualized, and these actions may constitute part of the viewing experience.

It should also be noted that a supporter of a team who watches that team's game live is actually adhering to in-group norms: this is what the fans do and, hence, are supposed to do. Typically a supporter witnesses this very concretely, as images of cheering fans are portrayed in the broadcasts. Not watching a game or national celebration live would be inconsistent with the behavior of other in-group members. It has been noted that people infer group norms from the behavior of typical group members, and therefore it is understandable why large masses of people may behave in a consistent manner, such as watching the game live—even without explicit guidelines (Reicher, 1984).

Watching from DVDs

Because of the ease of saving programs broadcast continuously on several TV channels, the HDD actually provides households with a huge library of shows to be viewed, at no cost, whenever one wishes.

Some families actually had difficulty watching all of the saved shows. Despite the abundance of shows saved on the HDD, interviewees in some households with a digital video recorder continued to rent DVDs.

Interviewees explained that DVD rentals were planned occasions that involved inviting friends over and buying beverages and food. One interviewee, a teenage girl, also explained that selecting films with friends in a video store was part of the DVD rental experience:

> Well, so there is a movie night and we are going to get the movie and we swarm around there and try to choose the one that pleases all who are going to watch the movie, and then we come home and watch it. But if I turn on, say, a computer, so, it is just—it is not the same thing.

Additionally, one interviewee explicitly said that he watched DVDs acquired from friends with more attention and often more fully than he did movies saved to the HDD. He was unsure why this was so.

Obviously, video stores offer more recent movies than regular TV channels do, but we also may consider other explanations for these reported practices associated with DVD-based watching. Renting or loaning DVDs might be seen as an established script, of the sort defined by Schank and Abelson (1977, p. 41): knowledge of predetermined, stereotyped actions that define a well-known situation. Additionally, a cultural script has been defined as a pattern of social interaction that is characteristic of a particular group (Triandis et al., 1984). The argument goes that there is not, at least not yet, a cultural script for watching films collectively from an HDD converter box or computer, but renting a movie with friends is a tradition of sorts, with a script.

It may also be that the slight effort and money involved in the rental process might elevate the movie experience positively. Paying for a bad film should arouse negative feelings, since it represents money not spent well. According to the well-confirmed theory of cognitive dissonance, individuals are prone to avoid dissonance of this type (Festinger, 1957; Egan, Santos, & Bloom, 2007; Van Veen, Krug, Schooler, & Carter, 2009) and thus should be persuaded to perceive paid movies positively. The more effort and money expended in the acquisition of a film, the better the film experience should be.

Just as effort might accentuate positive feelings associated with rented DVDs, it might also reinforce and uphold cultural scripts—for example, for consumption of food and drinks, and for collective decision making associated with the use of DVDs, as explained by the interviewees—and hence maintain use of this technology despite the very useful HDD converter boxes. HDD-based watching may be routine and not as festive as a DVD viewing, which may be a more positive, special occasion, irrespective of the quality of the film.

Comparison of Digital Television and PC Use

In a study conducted in 1997—that is, before the abundance of video-viewing services ,such as YouTube—it had already been found that Web surfing served as a functional alternative to television, as it was used for the same reasons as television: for entertainment, to pass time, as relaxation, and for

finding information (Ferguson & Perse, 2000). However, Web surfing was found likely to be less relaxing. In a more recent study (Haridakis & Hanson, 2009), similarities between television and YouTube watching were identified, as both were used for information seeking, entertainment, and co-viewing (e.g., watching together and talking with others), and YouTube was also used for social networking. Our findings are consistent with these conclusions, which are based on statistical correlations and questionnaire instruments. In our interviews, participants' reasons for using Web services were consistent with the reasons for watching television: entertainment, relieving boredom, co-viewing, information seeking, providing content for face-to-face interaction, and giving background stimulus (one interviewee said that at times shows weren't actively followed but "noise" aided in concentration on study activities). Along with television, YouTube was also used for pacifying children. However, when YouTube was utilized for this purpose, it was deemed more important to monitor the content being viewed. For example, the parents in one family that was interviewed were uncertain that the YouTube clips would contain what they were supposed to contain:

Man: One has to be a little more careful anyway so that—

Woman: As you said, as you turn it on it might say that it is something, but when you watch it, it is not what was expected, someone speaking instead, not the cartoon.

The Internet was also used for watching shows live. An exchange student who did not have a television set used specific software for viewing a certain football match live. Chinese exchange students viewed live broadcasts of nationally significant celebrations, such as a key Chinese New Year party, over the Internet.

Overall, a PC with Internet access may be used to meet the same needs as television. Because of the digital television transition, television and the PC have become even more similar, with many television sets now also equipped with HDDs, and both devices now often able to hold huge amounts of digital video content. The saving of shows is so effortless with HDD converters that, as already noted, some individuals were unable to watch all of the shows they saved. In practice, as various shows are constantly broadcast on several TV channels, an HDD in a converter box offers a great degree of liberty to watch "whatever" one wants "whenever" one wants. The Internet provides similar liberties through the RapidShare service and use of the BitTorrent protocol, though this content is usually illegal.

Despite these similarities, television and PC use actually are still applied in socially dissimilar manners. Several students without television sets were interviewed; among them, the PC had in fact replaced the television—it was put to all of the same uses as television—but among families the PC was outside the center of social interaction. The television set had a central place in the household (that is, in the living room), whereas the PC was placed in an office. "Office" here refers to any room outside the main bustle of familial life that includes the desk where the PC is placed. In some cases, this was the master bedroom of the house. Arranging furnishings in this way probably reflects the fact that the PC is also used for study and for work—that is, for activity that demands quiet—and for personal communication that demands privacy. Thus, the PC was not in a place where several family members spent time

simultaneously; it seemed that it was generally used by one person alone, except when watching content on the PC with very small children. However, some interviewees said that other family members were invited to view content on the computer; that is, co-viewing of television would occur partly because the set was in the space where people coexist simultaneously, whereas co-viewing on the computer happens when the viewer specifically points out content to another. This extract provides an example:

> Woman: In my opinion, watching a television series is associated with evening and on the sofa or in the armchair and somehow it is—it feels funny because we do not have the kind of laptop from which one could watch. So then it might be the same, so it could be there by the sofa and it could be similar, the situation. But since it is on the work desk, then it is like that. [. . .] Well, sometimes it has been that kind of situation, but those [cases] too are perhaps more with YouTube than Areena [an online service provided by the Finnish Broadcasting Company] when someone is there and he or she asks for coming and watching and then something is quickly watched.

A Swedish study indicated that more than half of the time spent watching television was social viewing in multiperson families (Bjur, 2009, p. 247). In a British study, among 12- to 15-year-olds 61% reported that, most of the time, when they use the Internet, they use it alone, whereas for television viewing the figure was 39% (Ofcom, 2008). The British study also indicated that television was mostly watched in the living room; 70% of 12- to 15-year-olds reported this. For Internet use, the figure was 44%.

Discussion

This article notes that the conversion to digital television persuades individuals to purchase easy to use digital recording devices that inspire the habit of watching many—sometimes almost all—shows from an HDD. When watching from an HDD, advertisements are skipped over and a TV viewer may completely avoid conventional television advertisements. Because HDDs thus diminish advertisers' capability to influence potential consumers, our findings have relevance for the discussion of how technological change can affect existing power structures. Additionally, considering a sociological interpretation put forth by one of the interviewees—"if everyone had a recording converter box, this is what I think; commercial channels would die out"— we contemplate the losses and benefits to the television industry that result from the digital conversion and HDD converter boxes.

Castells (2007) has argued that, because of new communication channels provided by new communication technologies, social movements and grassroots politics have better opportunities to spread their arguments and points of view. He has noted the following three trends that illustrate this. First, the Internet has provided new possibilities for political campaigning. For example, instead of a few large donations from the wealthy, myriad small donations can be collected over the Internet from the general population. Second, the Internet offers a means of widespread broadcasting and distribution for independent journalists who do not work for government- or business-controlled mainstream media. Internet-based pirate radio and TV stations, as well as the Indymedia movement (a network of independent journalists reporting on political and social issues), are concrete examples of this. Third, the

prevalence of cell phones makes it increasingly difficult for governments to manipulate or hide information, since people may distribute their perspective on an event in a spontaneous manner horizontally for each other. For example, the Spanish government tried to promote the perception that the Madrid train bombings were executed by Basque terrorists. This would have ensured reelection, but widespread campaigning via text messaging by young people in Spain spread the view that Al-Qaida was behind the attacks (which made the attacks a consequence of the government's support for the war in Iraq), and eventually the largest opposition party won the elections (Castells, Fernandez-Ardevol, Qiu, & Sey, 2004).

We provide an alternative angle to this discussion. In Castells' (2007) observations, grassroots political actors and social movements may more decisively take part in social change as new communication technologies are appropriated by independent journalists, political campaigners, concerned youth, and other activists. The present study describes shifts in communication power that may also come about as a result of better usability of new technologies and the consequent changes in the habits of average people (nonactivists) when using these technologies. In other words, people's search for comfort through the use of new technologies may manifest itself in changes in the underlying structures determining who is able to communicate what to whom. Political or ideological motives are not necessary: it is simply less effort to skip over the advertisements than to watch them with the HDD.

It profits advertisers and commercial television channels that viewers did not prefer the HDD for watching events or programs that had collective cultural significance. Those purchasing television advertisements gain more value for their money and greater influence for their message if their advertisements are aired during programs that viewers prefer to watch at the time of broadcast, rather than afterward from the HDD. As previously discussed, because of a preference for experiencing emotions with the group one identifies with and adherence to group norms, viewers do not prefer the HDD converter box for watching content such as major sporting events or national celebrations.

Similarly, it benefits the motion picture and video industries if the renting of videos remains a festive and ritualistic planned occasion in contrast to habitual watching from the HDD. Video rental can involve a cultural script or a custom that includes established practices, such as going to a video store with friends and consuming food and beverages; hence, people have incentive to continue using DVDs in spite of HDD libraries.

One may also infer that, in the long run, HDD converters may also serve the television industry. It is not out of the question that eventually people will replace television sets with PCs altogether, since the two are used for similar purposes (Ferguson & Perse, 2000; Haridakis & Hanson, 2009)—as found in our study, even to pacify children. We found some specific differences in practices: the television, located in the living room, is regularly viewed by several family members, whereas the PC, in the office area of the household, is co-viewed upon invitation—that is, when the user of the PC finds something so interesting on the Internet that he or she judges it worth sharing with another family member. However, as new software strives for effortless usability and a "lean back"–type viewing experience similar to what is seen with television, differences of this type may progressively dissolve. For example, Boxee is a service that allows use of an iPhone as a remote control for viewing video content on the Internet and from a PC's HDD.

Free content provided on the Internet has already caused a huge decline in the newspaper industry (Meyer, 2004). The HDD converter might serve as a buffer preventing a similar fate for the television industry. Statistics Finland (2010) reported that 19% of those surveyed indicate that they use a computer as a television set. As HDDs allows people the freedom to watch shows easily when they wish, it seems a sensible view that this technology would reduce willingness to watch shows only from the PC.

The digitalization in general has also amplified people's freedom of choice and hence television channels' competitive position vis-à-vis PC-based viewing. Hellman (2010) has found that in Finland the licensing process involved with digitalization has resulted in a surge of commercial TV channels providing programming that attracts mainstream market segments; that is, more options, although among limited popular genres, are offered for the people. Actually, this proliferation of shows might have increased the need for time-shifting and use of HDDs because of overlapping broadcast times. However, according to Finnpanel's (2009) statistics, the channels that date back to the pre-digitalization era are far more popular than the newer ones; hence, the new channels can be assumed to have only a limited effect on viewing habits.

Media companies do not hesitate to attempt to influence governmental actors and take legal actions as they try to ensure continuation of their profits: despite questionable benefit to the public, companies have lobbied for extension of copyrights (Landes & Posner, 2004), and in Finland they have been challenging a service for distributing Finnish television channels via the Internet (Nieminen, 2010). It is therefore almost surprising that, at least to the best of our knowledge, commercial television channels have not opposed the digitalization process. Perhaps they have not anticipated the ability of the HDD converter box to reduce exposure to advertisements. However, since legislative means can restrict people's appropriation of technological change only to a certain degree—for example, illegal file sharing has been considered to have caused a decline in music sales (Liebowitz, 2006)—it is understandable that other means are necessary. The conversion has offered television channels a way to jump on the bandwagon of digitalization of communication technologies: digital conversion seems to have strengthened the position of television as a feasible option among entertainment and communication technologies far into the future.

Limitations and Avenues for Future Study

This article has explored various aspects of how digital conversion and HDD converter boxes affect individuals' behavior. Survey methods and statistical analysis would be needed to examine the generalizability of the results. For example, the following questions remain unanswered: (1) How common is the habit of watching almost all shows from the HDD? (2) How does the prevalence of use of HDDs vs. watching live television vary among show types and how is this is mediated by individuals' identities and preferences?; and (3) In how many families are the television and PC used differently, as described earlier in this article (the former for habitual and common co-viewing and the latter for co-viewing selected content with others)? This study also includes inferential and theory-based explanations of connections between (1) the experience of effortlessness and the habit of watching most shows from the HDD, (2) social identity and emotions associated with live viewing of sports and other culturally important events,

and (3) cultural scripts and the continuing use of DVDs. These interpretations could be confirmed by operationalizing the theoretical constructs and statistically testing correlation levels.

This study has emphasized the positive, liberating aspects of HDD-based television watching, but in principle the increased freedom of choice might also hinder television's capability to disseminate knowledge and shared values and opinions widely. Freedom to choose does not necessarily encourage individuals to broaden their viewing habits from their normal fields of interest: those interested in sports might watch more sports shows, and those interested in politics might watch more programs on politics. Watching television without recording encourages compromises: some shows may get watched simply because they are broadcast at convenient times. It is quite likely that, for a majority, this is not a concern given that people rely on multiple sources of information and are interested in a variety of issues, but for some, HDD television might lead to a more "tunneled" habit of media use. Then again, the Internet too provides control over exposure to messages, as HDD converters do, yet studies on browsing political news online do not suggest that the Internet creates "echo chambers" or "cyber-Balkanization"—that is, users cutting themselves off from dissenting opinions (Garrett, 2009; Kobayashi & Ikeda, 2009). However, it is hard to say how this issue may unfold in entertainment-driven television use. It is also noteworthy that, although digital communication technologies might not induce chambered or tunneled media use habits *in general*, they might do so for a few individuals; therefore, the quantitative methods used should not rely solely on pinpointing averages but would have to aim to explore how many individuals, if any, exclude themselves from mainstream messaging and instead adopt solely alternative or subcultural points of view.

Additional studies would also be needed to explore how the use of digital video recorders develops when digital television conversion occurs in countries that differ economically and culturally and also in government actions related to the conversion. Finland is a country with relatively low income differences (U.S. Central Intelligence Agency, 2009) and one in which the government did not subsidize the converters. In contrast, some countries' governments may subsidize inexpensive, nonrecording converters for the poor, while the rich might purchase a digital video recorder irrespective of the conversion to digital television. It might be that in countries with less purchasing power and larger income differences, the prevalence of HDD converters would remain lower than in Finland, where, according to Statistics Finland's Consumer Survey (2010), almost half of the households currently have one. It is worth noting that the U.S. government launched a program enabling consumers to acquire converter boxes with government-subsidized coupons, but the coupons could be used only for "a stand-alone device that does not contain features or functions except those necessary to enable a consumer to convert" (U.S. Department of Commerce, 2007); in other words, converter boxes with HDDs were excluded from the program, to the benefit of commercial TV channels. Some countries also have well-known brands of digital video recorders, such as the TiVo. Therefore, some of the interpretations and findings presented in this article might not predict the outcomes of conversion in all countries.

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