

Television, Digitalisation and Flow: Questioning the Promises of Viewer Control

Hallvard Moe

University of Bergen

The hype surrounding the marketing of and writing about digital television has, since its advent in the 1990s, focused extensively on freedom and control for the viewer: new technology will render channels superfluous, offer unlimited content on-demand and provide full interactivity. Everyone will be in complete control of their very own television use – their own MeTV. By looking back at television history, and scrutinizing existing services in today's advanced market, this paper offers an approach to discuss to what extent such promises prove to be true. In doing so, the paper also elaborates on the consequences for a key metaphor in television theory: based on Raymond Williams' concept of flow, and later developments of it, I discuss how services and tools that set out to give the user increased control –from the remote control of 1920s to today's digital video recorder– all exist inside the relatively stable structures of broadcasted television. Rather than just labelling the television user as 'free' and 'in charge', it is more useful to also take into consideration how these structures help shape the possibilities. This leads to, on the one hand, a critical and balanced analysis and, on the other hand, the identification of merely moderate prospects for user-participation in television.

Introduction

The discourse on digital television has, since its advent in the 1990s, focused extensively on *freedom* and *viewer control*: new digital technology will render channels superfluous, offer unlimited content on-demand and provide full interactivity. Everyone will be in complete control of their own television use, freed from the tyranny of the television networks, their schedules and offers. Such predictions concern both the organisational form, and the uses, of television. Together they are said to be changing in a fundamental way, paving the way for new forms of user-participation and true interactivity. Thus, television theory and its conceptualisations of the current and future state of the medium are also challenged.

It is important to note that the focus on freedom and control is not limited to the discourse on digital television; it permeates discussions of ICT in general. In addition, we should not be blind to the fact that some of these statements

belong to the realm of marketing. Thus, one might question taking them seriously in this context. Still, these buzzwords – as crude as they might seem – represent widespread views, and thereby fit as entry points for a more balanced discussion of the development of television, and its uses (e.g. Toscan & Jensen 1999). Furthermore, such strong beliefs or promises are not restricted to advertising and industry journals. On the contrary; they flourish in political documents as well, and to some degree also in scholarly work (cf. Moe 2003, Cox 2004 for recent example).

Historical experience should prevent us from joining such discourses, at least without some reflective hesitation. This paper offers one approach to the discussion of these promises accompanying digital television, and more specifically to what extent they prove to be true. In doing so, the paper also elaborates on the consequences for a key metaphor in television theory. The starting point is television's organisational form as broadcasting, and its traditional uses. I first employ Raymond Williams' concept of *flow* to examine the historical development of tools and services that set out to put the viewer in control. Second, applying a reworked concept of flow, I argue that these tools and their uses exist inside, and in a critical way relate to, the relatively stable structures of broadcasted television. Rather than just labelling the television user 'free' and 'in charge', it is useful to take into consideration how these structures have contributed to the shaping of past developments, and will continue to influence future possibilities. Thus, the final part of the paper consists of an attempt to relate some of the possible developments of digital television technology to the reworked concept of flow.

Broadcasted Flow Vs Control and Freedom

Television means to see from a distance, and was first thought of as 'a telephone combined with binoculars' (Stöber 2004:491). Since the Second World War, television technology has been put to use, both by the military and by a variety of industries, for surveillance purposes (Allen 1983). Simultaneity between sender and receiver is then obviously central to the technology's value. Still, in everyday language, we do not consider this television. Program formats such as *Big Brother* rely heavily on both the technology and aesthetics of surveillance. Yet, we call it television only when the pictures are edited by a producer, distributed and received at home, as part of a broadcaster's program schedule. Television is, in other words, strongly linked to broadcasting – an agricultural metaphor originally meaning to spread seeds in broad circles by hand (Gripsrud 1998:18-20). *Broadcasting* came to describe an organisational form of radio and television characterized by one-way, simultaneous distribution of content from a centre to the periphery. As broadcasting, the technology of radio and television was put to use fulfilling important demands and needs in modernizing societies: national authorities needed to distribute important information and cultural and educational content efficiently to all citizens at

the same time. Broadcasted radio, and later television, thereby became an important tool in the creation and maintenance of a common, national identity. For the users, typically nuclear families relocated through social and geographical mobility, cultural and social input directly into the living room was very much in keeping with their demands (Williams 1975:26ff, Gripsrud 2002:270).

Broadcasting has prevailed as an organisational form for almost 70 years. The promises of viewer control and freedom following the introduction of digital television challenges this form through disruption of the relationship between sender and viewer. Scrutinizing broadcasting history, we find a development that is very relevant to an understanding of the validity of this challenge: tools that set out to provide viewers with possibilities to control the program flow they receive through increased interactivity.

In critical television research, the concept of *flow* stems from Raymond Williams' experience with American television some thirty years ago: the advertising breaks and the trailers for up-coming movies which with decreasing intervals got mixed into the program Williams was trying to watch, created 'a single irresponsible flow of images and feelings' (Williams 1975:91). Consequently, for the viewer, different elements appeared 'linked to each other, across the seemingly clear divisions into different programmes and sequences' (Gripsrud 2002:212). Williams described flow as 'perhaps the defining characteristic of broadcasting' (Williams 1975:86). Furthermore, it is planned – thereby giving a sense of 'culturally specific and industrially strategic' shape or continuity to what is watched (Corner 1999:66).

Two comments to this concept of flow should be noted (Gripsrud 2002:212ff). First, the feeling of flow is not unique for television. It is typical of broadcasting, and with that also of radio. In addition, one can argue that for example newspapers and variety stage shows have a built-in flow quality. Second, the metaphor signals a passive audience with no will on their own. As various research after for example Stuart Hall ([1973] 1992) has shown, the texts of broadcasted media are decoded and interpreted by an active audience. To escape negative connotations, one alternative is to situate the viewer beyond the flow: John Ellis (1992) describes how we experience television at a glance – the flow is glanced at from a distance. With these remarks in mind, we can return to the development of tools and services designed to control this flow.

The first remote control devices (RCDs), offered for sale in the USA at the end of the 1920s, were heavy boxes connected to a motor in the radio set via a cable under the carpet. They presented the listener with possibilities both to control the sound level and change channels – without having to get up from the couch (Benjamin 1993:15ff). The tool was supposed to manipulate the broadcasted flow, and as the name indicate – give the user control. An important selling point was the prospect of avoiding unwanted commercials. With the television RCD *Blab-off*, for example, launched in the 1950s, 'the TV fan [can] select the advertising he wants to hear, and he can get away from the commer-

cial he dislikes' (Walker quoted *ibid*:17). Articles calling on viewers to take control of their television also appeared in the US mainstream and popular press during the same period (Uricchio 2004). In other words, the viewer was encouraged to organize the flow he or she wanted to experience. Today, the RCD is an almost inescapable part of the television experience. Following the enormous growth in channel output, turning off the sound is not the best way to escape annoying commercials; simply switching channels is much more efficient. However, the viewer still has no control over the schedule – no option to manage the timing or order of it. This was supposed to be taken care of by another tool.

'A slave of TV? Sony Betamax returns your long lost freedom'. In 1980, this was Sony's slogan for their brand new video cassette recorder (VCR) (priced at 1000). By recording the programs you really wanted to watch, your family would get more quality time together. The VCR was designed to basically eliminate the effects of broadcasted television (Prehn 1981:234). It would end 'the tyranny of the program scheduler, allowing for time shifting and personalised archiving' (Winston 1998:127). Manipulation of the flow using VCRs has, despite technical facilities, in practice been limited. To the extent that it is undertaken, the result is often just mounds of unwatched tapes stacked in the living room (Ellis 2000:76).

The promises given 20 years ago are still prominent in the digital market of today: 'TiVo means freedom. Now we can do everything we want to do, and still never miss our favourite shows' (TiVo 2001). This statement is ascribed to a smiling nuclear family in a brochure promoting TiVo, USA's leading provider of services for digital video recorders (DVRs). DVRs record on hard drives instead of tapes, and offer simultaneous recording of one program, while another is being watched. This makes it possible to pause live television when the phone rings, and skip commercials by fast forwarding. The DVR is yet another tool that offers viewers control of the broadcasted flow, now through time shifting and archiving. Companies like TiVo add an extra service: by connecting to a central server, and making use of what is essentially a built-in mini computer, the DVR can remember and 'learn' viewing preferences, and thereby suggest and record programs according to your taste. It essentially offers a smart Electronic Program Guide (EPG), hooked up with a recorder. This way, as competitor British Sky (2004) promises its customers, 'there's always something you'll love whenever you turn on the TV'.

This latest and most advanced tool designed to provide the viewers with control and freedom should be seen in connection with services such as *near-video-on-demand* and *playercam* – of interest due to the boost in transmission capacity following digitalisation. The first is based on the same technique that makes it feasible to divide movie channels in three and start each movie every 30 minutes. In addition, near-video-on-demand presupposes communication from receiver to sender: as a user you choose from a list of titles, and pay for access to the movies you like. All movies start at relatively short intervals. This

service is available on a small scale in several European markets, and facilitates the organisation of personal television flows. Playercam is – as the name hints at – developed principally for sports programs. During a tennis match, for example, one channel distributes the professionally edited broadcast. At the same time, the feed from cameras filming each of the two players are continuously distributed on other frequencies. As a result, the viewer can choose to scrutinize the footwork of one player, or stick to the normal, professionally cut broadcast, including slow-motion and commentators. Playercam has so far only been introduced on a limited level for special events, by broadcasters such as BBC and distributors like Canal Digital. Again; the flow can potentially be organized and controlled to a larger degree by each viewer.

Notwithstanding the extra amount of decisions and ‘work’ they bring to the television experience, there is no questioning the value of services such as these and improved recorders like DVRs. They can reduce everyday irritants – the interfering phone call or your favourite reality show and the news, both starting at nine o’clock – and offer a better viewing experience. But how important are these tools for the organization of flow? How much freedom and control do the viewers really have?

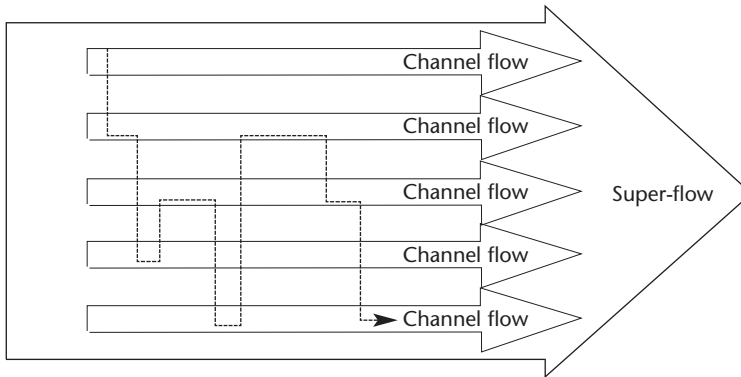
No Flow or New Flows: Reworking Williams’ Concept

When taking these tools into consideration, Williams’ description of flow seems hopelessly outdated as an analytical concept. It is quite obvious that the television experience of the mid-1970s was something very different from using the advanced services of today. The ways in which the flow can be manipulated by each individual viewer are so numerous, the technical solutions so much better, that concentrating solely on broadcasters’ program flow is inadequate and unsatisfactory. This is far from a new discovery; the concept has been revised and put to use supporting a range of different arguments over the last 30 years. John Corner (1999:60ff) provides a good overview and, pointing to the original definition as dynamic and shadowy, cautions against further attempts to rehabilitate the notion of flow. One main problem is that on a macro-level, flow has been used to depict coherence or consistency, while on the level of viewing experience, the concept has described confusion.

I will argue that the notion of flow as a matter of macro-level textual organisation, as a characteristic of television’s organisational form, still is valuable for an understanding of the changing viewer interface with the medium, and thereby the current state of television. Importantly, a continued use depends on a more nuanced notion of the concept’s meanings. By attempting to identify different parts of the notion of flow, the concept can be useful in a context considering television in a longer historical perspective. Failing to maintain and rework the concept would, in the words of William Uricchio, ‘seem to deprive our thinking about the medium of a vital element [...] and an element of discursive continuity’ (Uricchio 2004:177). Instead, the concept can act as a means

to outline developments in the organisational form of television and the relationship between sender and viewer. With this in mind, I employ a revised version of the concept to throw light on the question of how much control is in the hands of the users in today's digital television environment.

When studying television use in multi channel homes some 10 years ago, Klaus Bruhn Jensen suggested a differentiated concept of flow (Bruhn Jensen 1995:108ff). He distinguished between three types: firstly, every television network or company plans a *channel flow* to keep the viewer watching for as long as possible. This is the category closest to Williams' original concept when describing textual organisation on a macro-level. Secondly, every viewer creates her or his own *viewer flow* based on all presently available content. Here, the understanding of the subjective experience of each viewer, as also included in the original concept, is in focus. Finally, these two categories can be related to everything that is available on all channels – television's *super-flow* (figure 1).



----- Example of viewer flow

Figure 1: The three parts of flow (Jensen et al. 1993:11).

Bruhn Jensen's study of American television viewers made him put forward a preliminary critique of the notion – at the time – of a 'new, powerful viewer' (Bruhn Jensen 1995:121): the multi channel environment did not remove viewers from the super-flow's downward cultural constraints. Rather, the viewing context was different and more expansive. One might add that certain elements of the subjective viewer experience described by Williams were changed – notably the confusion he felt. As a conception, though, viewer flow still captured essential characteristics of television use. In the mid-1990s, the last television monopolies of Western Europe were gone. Thus, the reworked concept of flow was applicable also here. Bruhn Jensen emphasised that it was particularly the super-flow that had changed – expanded, that is – since the advent of multi channel television. In addition, each channel flow was more thoroughly prepared in order to keep viewers from zapping (Bruhn Jensen et al. 1993:11).

One can argue that this description to a large degree also applies to the situation today. The point is that the viewers' choices – that make up their viewer flows – the whole time is limited by the super-flow. Even though the latter has kept on expanding, and possibilities for time shifting has improved, the super-flow and its parts are carefully organized and controlled by the broadcasters. Facing viewers' growing assortment of tools facilitating manipulation, producers, advertisers and programmers seem to be intensifying their efforts to improve the channel flows (Uricchio 2004). The options available to viewers are still subject to the offers of the television networks and distributors. Advanced EPGs still only present what the distributor allows delivered through the set-top box – which is in effect an important gateway. And despite numerous niche channels and on-demand offers, the relative homogeneity of television's super-flow – the content and themes available to viewers – is still striking. Although counter-flow feedback is possible, it is in practice minimal, and far from fulfilling the prospects for user-participation. As Graham Murdock (2004:9) puts it; 'viewers are still responding to options orchestrated by programme makers. They may have an increasingly flexible menu to choose from but they are still not allowed in the kitchen'. The development of tools and services designed to increase personal control of flow, and the actual use of them, exist inside the relatively stable structures of broadcasted television. Rather than calling the viewer 'free' and 'in charge', it is useful to take into consideration how these structures have contributed to the shaping of past developments, and will continue to influence future possibilities.

One additional constraint should also be noted: even though the prices are going down, high-end equipment and services are still quite expensive. Costs and price policies are also contributing to an impression of the provider-user-relationship as top-down. In a comprehensive study of users of digital television in the UK, carried out for the British government, numerous customers expressed exactly the feeling that the distributors or providers were in control – not themselves (Counterpoint 2001). The users especially complained about the constantly changing composition of channel packages, and popular sports events getting ever more expensive. Even though they were able to pick and choose among a plentiful of offers, the viewers were fully aware of their position as customers of big media companies – they felt powerless. Their best hope was flourishing competition, facilitating a switch of providers if conditions got intolerable. Similar attitudes were also prominent in a recent small-scale Norwegian survey (Redzepi 2004).

The notion of digital television and related services as liberating for the viewers should be looked upon with a certain amount of scepticism. The viewers are not in control. While the number of choices is greater, the fundamental relations of power between broadcasters and their viewers essentially remain the same. Significantly, through reworking and differentiating the original concept, the notion of flow is still valuable to an understanding of the current state of television.

New Developments – New Challenges

This is not to say that the current situation is clarified and settled. On the contrary; the technology, the television experience and the relationship between broadcasters and viewers are constantly changing – even though they form part of a long and sometimes slow process. At least two detectable lines of ongoing developments are relevant in this context: first, the shift of power and control to an emerging industry related to new filtering services. Second, the possibilities of an opening up of television systems to networks and content associated with computer and Internet use. While these do not exhaust the field of digital television development, they represent its main trends. The processes were for obvious reasons not taken into consideration when flow was discussed in the mid-1990s. Therefore, in addition to discussing the developments per se, the question is to what extent a reworked notion of flow still is valuable for our purpose.

The scenario sketched out by these potential lines of development is not all new. It fits well with the promises of existing tools and services facilitating increased control and freedom. Furthermore, the developments we see now most definitely do not represent the final stage of the processes. I want to discuss the relevance of flow in a situation where the envisioned result is reached. Even though the two lines of development do not exclude each other – rather they overlap – I attempt to relate them one at the time to the reworked concept of flow outlined above. Based on this discussion, some preliminary conclusions can be drawn regarding the usefulness of the concept of flow, and the prospects further on for promises of freedom and viewer control accompanying digital television.

I have already described how TiVo and similar companies offer services that can ‘learn’ what you like to watch, and thereby record, store and suggest programs especially for you. Such services presuppose a large number of available channels or other forms of content, and a large capacity recorder. The crucial part, however, is some kind of filtering and categorization system, rendering possible searches for programs according to the customers’ tastes and interests. The result, according to providers like TiVo, is increased freedom and control for each viewer. The search part, as anyone who has ever used an Internet search engine can agree on, is a difficult task. Successful searches will depend on accurate metadata on program genres, content, cast, start and stop times etc in order to return a relevant list. It is apparent that whoever determines metadata protocols – deciding what will be labelled and how – and design these search engines, holds a powerful position. William Uricchio conceives the result as a new factor entering the equation: ‘neither the viewer nor the television programmer dominate[s] the notion of flow’ (2004:176). Instead a shift of agency will occur, a shift to ‘metadata programmers and adaptive agent designers’, leading to ‘rapid growth in the power and presence of as-yet unheard of industries’ (ibid.:178).

Such an outline of the development seems plausible. In connection to the promises of freedom and control, two observations can be put forward: first, from the viewer's perspective, the distinction between the television programming industry and the metadata programming industry might have less relevance. Regardless of which company does the program labelling – and that company's connection to the program makers and distributors – the viewer has no say in the process. The same applies to questions of search engines, and their design. Second, the scenario laid out above can be more directly related to the reworked concept of flow. The envisioned result of these services can be described as an automated viewer flow: the choices are to a large degree based on information from, and more or less directly undertaken by, the service rather than the viewer. It seems like a 'prime case for flow' (Uricchio 2004:177). The relation to the larger super-flow, crucially, does not change. Viewers are still picking content developed and organized inside the same structure of the industry of broadcasted television. At this level, the relationship is unchanged. On another level, to the extent that the envisioned result is achieved, the importance of the organisation of individual channel flow for each sender is again threatened. This could be presented as an argument against the continued use of the concept. However, the potential development does not mean the immediate end for television channels. Rather, the challenge is likely to force programmers to intensify their efforts. This far, Bruhn Jensen's reworked notion of flow can still serve as a useful metaphor for key elements in an understanding of the television-viewer interface.

The second identified process, convergence between the computer and the television as terminals for audio-visual content, has the potential to challenge the reworked model of flow in a more fundamental way. Television networks are closed and rigorously controlled by the distributors. To a large extent they decide who receives what. This is an important presupposition for the notion of super-flow. The totality of offers is definite and well arranged. In stark contrast to this environment we find the Internet, where control of production, distribution, copying and use of audio-visual content seems almost non-existing. The basic technical structure of the Internet, as a 'stupid' infrastructure connecting 'smart' terminals, facilitates a pattern of use drastically different from the television networks. Audio-visual content on the Internet does not follow the organisational form of broadcasting. Rather than being sent or offered simultaneously from a few to many, content is actively accessed and collected by each user on demand, potentially from many producers.

For broadcasters, such an expansion of the television environment entails a grave challenge. For users, it opens up possibilities – not least in the direction of increased user-participation. For the use of the reworked concept of flow, the envisioned result of the developments outlined here has interesting consequences: firstly, connecting the Internet to the television could facilitate use threatening to dislocate the concept of super-flow. Given that the technical possibilities and the pattern of use are transferred, the boundaries of television's flow

would be blurred. Building on Bruhn Jensen's model, we would have to add content being distributed outside the super-flow, illustrating how the viewers' choices to a smaller extent would be restricted by the television distributor's offers. If the content outside the 'old' flow increases in importance, the user might come to a point where it no longer matters where the content originated. Correspondingly, the notion of super-flow would lose much of its importance. Secondly, the same argument could be made for the notion of channel flow. The audio-visual content distributed over the Internet potentially goes both ways, and is to a large degree actively 'pulled down' or downloaded by users. In such cases both parts of the term channel flow appear less fitting. Thirdly, the viewers, for their part, will continue to construct flows. Neither a blurring of the boundaries of the super-flow nor the inclusion of content not fitting to channels and flows will mean the end of viewer flow as Bruhn Jensen described it. On the other hand, in this scenario even less is left of the irresponsible, confusing flow experienced by Williams. Thus, to the extent that viewer flow is useful in this situation, it is primary as an analytical tool when studying viewers relationship with television's organisational form, and only to a lesser degree as describing a subjective viewer-experience resembling Williams'.

As emphasised, the developments laid out here are uncertain at the best. They represent a situation where some of the most extreme visions of convergence between the computer and television are achieved. The history of the relationship between television and viewers warns against drawing premature conclusions. Scrutinizing one part of this history, I have argued that ever since the birth of the medium there have existed tools and services all promising freedom and control for the viewer. These devices stand in direct opposition to the traditional role and effect of television as broadcasting. The latest tools and services related to digital television should be studied in relation to this development: they stand out as technically improved – not revolutionary new. Their effect on the television-viewer interface is best understood with the organisational form of broadcasted television as a starting point, and taking economical as well as social and cultural processes into consideration. I have argued that despite better tools, the current broadcaster-viewer relationship is still very much top-down. Instead of labelling the television viewer 'free' and 'in charge', it is more useful to take into consideration how the structures of broadcasted television contribute to the shaping of the developments. This would call for some scepticism when discussing the prospects for an opening up of the television environment, facilitating, for one thing, increased user-participation. The road ahead is not clarified.

What does such a reservation mean for the usefulness of the concept flow? I have argued that a reworked concept – based on Bruhn Jensen's three parts – still is valuable when describing the relationship between viewers and digital television of today. The condition is that the concept is focused more on macro-level textual organisation, the characteristics of television's organisational form, than the subjective experience as described by Williams. When testing the con-

cept on the envisioned result of two incipient lines of developments – the shift of power and control to an emerging industry related to new filtering services and the possibilities of an opening up of television systems to the Internet – the parts all appear to lose some of their usefulness. However, we are not quite there yet, the results of these developments are all but clear. The need for additional research is apparent. I have argued for taking the relatively stable structures of the television system and the viewer-broadcaster relationship as a starting point for further analyses of future possibilities. This approach calls for a continued use of a reworked concept of flow in critical television studies. And it might facilitate balanced discussion of digital television and the promise of freed viewers.

References

- ALLEN, Jeanne (1983) "The social Matrix of Television: Invention in the United States" in Anne E. KAPLAN (ed.) *Regarding Television: Critical Approaches – An Anthology*, Los Angeles: The American Film Institute
- BENJAMIN, Louise (1993) "At the Touch of a Button: A Brief History of Remote Control Devices" in James R. WALKER & Robert BELLAMY Jr. (eds.) *The Remote Control in the New Age of Television*, Westport, Connecticut, London: Praeger
- BRUHN JENSEN, Klaus, K. SCHRODER, T. STAMPE, H. SONDERGAARD & J. TOPSOE-LARSEN (1993) *Når danskere ser TV – En undersøgelse af danske seeres brug og oplevelse af TV som flow*, København: Samfundslitteratur
- BRUHN JENSEN, Klaus (1995) *The Social Semiotics of Mass Communication*, London, Thousand Oaks, New Delhi: Sage Publications
- CORNER, John (1999) *Critical Ideas in Television Studies*, Oxford: Clarendon Press
- COUNTERPOINT (2001) *Digital Television – Consumers' Use and Perceptions – A Report on a Research Study, Prepared for: Oftel*, London: Counterpoint
- COX, Barry (2004) *Free for All? – Public Service Television in the Digital Age*, London: Demos
- ELLIS, John (1992) *Visible Fictions – Cinema: Television: Video, revised edition*, London, New York: Routledge
- ELLIS, John (2000) *Seeing Things – Television in the Age of Uncertainty*, London, New York: I.B. Tauris Publishers
- GRIPSRUD, Jostein (1998) "Television, Broadcasting, Flow: Key metaphors in TV Theory" in Christine GERAGHTY & David LUSTED (eds.) *The Television Studies Book*, London: Arnold
- GRIPSRUD, Jostein (2002) *Understanding Media Culture*, London: Arnold
- HALL, Stuart ([1973] 1992) "Encoding/decoding" in S. HALL, D. HOBSON, A. Lowe and P. Willis (eds.) *Culture, Media, Language*. London, New York: Routledge [Abridged version of HALL, Stuart (1973): *Encoding and Decoding in the Television Discourse*, Stencilled Occasional Paper, no. 7, CCCS, Birmingham]
- MOE, Hallvard (2003) *Digitaliseringen av fjernsyn og allmennkringkastingens skjebne*, Rapport nr. 54, Bergen: Institutt for medievitenskap, Universitetet i Bergen
- MURDOCK, Graham (2004) *Building the Digital Commons: Public Broadcasting in the Age of the Internet*, The 2004 Spry Memorial Lecture, Vancouver, 18th November/Montreal 22nd November, Online: <http://www.com.umontreal.ca/spry/spry-gm-lec.htm> [31.01.05]
- PREHN, Ole (1981) "Nyudviklinger i medie-verdenen: Videogrammer og kabler – fremtiden inde i billedet" in Frands MORTENSEN, Jørgen POULSEN & Preben SEPSTRUP (eds.) *Underholdning i TV – Dansk massekommunikasjonsforskning 1*, København: Nyt Nordisk Forlag Arnold Busck
- REDZEPI, Seila (2004) *Interactivity and Transformation of Television Audiences*, Master Thesis, Department of Information Science and Media Studies, University of Bergen
- SKY (2004) *The Amazing World of Sky+*, Website, Online: <http://www.sky.com/ordersky/equipment/skyplus> [31.01.05]
- STÖBER, Rudolf (2004) "What Media

Evolution Is – A Theoretical Approach to the History of New Media” in *European Journal of Communication*, vol. 19, issue 4, pp. 483-505

TiVo (2001) *TiVo, TV Your Way*, Advertising brochure, TiVo

TOSCAN, Cathy & Jens F. JENSEN (1999) "Introduction" in Jens F. JENSEN & CATHY Toscan (eds.) *Interactive Television – TV of the Future or the Future of TV?*, Aalborg: Aalborg University Press

URICCHIO, William (2004) "Television's Next Generation: Technology/Interface Culture/Flow" in Lynn SPIGEL & Jan OLSSON

(eds.) *Television After TV – Essays on a Medium in Transition*, Durham: Duke University Press

WILLIAMS, Raymond (1975) *Television – Technology and Cultural Form*, London: Routledge

WINSTON, Brian (1998) *Media, Technology and Society – A History: From the Telegraph to the Internet*. London, New York: Routledge