FROM VIEWER TO DECISION-MAKER:

THE IMPACT OF DIGITAL VIDEO RECORDERS ON HOUSEHOLD MEDIA CONSUMPTION

by

SARAH MARGARET SMITH

(Under the Direction of Dean M. Krugman)

ABSTRACT

The purpose of this study is to assess the role of digital video recorders (DVRs) in the home and to examine whether and how the DVR has impacted household media consumption. Research questions covered three broad areas related to DVR use. The first area involved how owners conceptualize the DVR in terms of how they define it, how they compare it to other media technologies, and whether they think it is interactive. The second area involved categorizing DVR homes based on whether the DVR is continuous or discontinuous in terms of its impact on household media use; use orientation based on variety and rate of use; and perceived innovative characteristics including relative advantage, compatibility, observability, trialability, and complexity. Third, media consumption issues included the perceived role of the DVR in the home, specific media consumption behaviors, and social aspects of media use. Interviews and in-home observations were conducted with participants in 21 households in which a DVR was present. The key finding of this research is that DVR owners perceive that their media use has been transformed from simply viewing television to participating in media decisions. The DVR gives users expanded options for selecting, recording, scheduling, and manipulating content. This allows the user greater freedom to override decisions made by media organizations.

INDEX WORDS: Digital video recorder, DVR, Television, New media technology, Media consumption, Continuous/discontinuous innovations

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CHAPTER 1

INTRODUCTION

This study uses a qualitative approach to examine the potential impact of digital video recorders (DVRs) on household media consumption. For the purposes of research, a DVR is defined as an electronic device that uses a computer hard drive to (1) record and store television programs and (2) allow a customized viewing experience for recorded and live programming.

The DVR records television programs in a digital format, as opposed to the magnetic tape used for VCR recordings (Holloway 2004). Viewers can search for programs to record through a number of options, such as scrolling through a program guide, typing the names of shows, actors, or topics of interest into a search engine, or browsing through categories such as movies or sports. Both the program guide and the searchable menu system can be displayed on the television screen using the DVR's remote control. Besides these recording features, DVR users can also manipulate programming through the ability to pause, rewind, or fast-forward live or recorded television programs (Giblin 2004).

Growth of DVR Usage

The DVR is currently owned by approximately 10 percent of American households (Buetow 2005), and an additional 7 percent of survey respondents say they plan to purchase one during the last six months of 2005 (One-third of Americans… 2005). Estimates predict that as many as 33.5 million homes will have a DVR by the end of 2008 (Hargreaves 2004). Reports suggest a high level of owner satisfaction with the DVR (Giblin 2004), and that current users perceive the DVR's recording features to be easier to use than a VCR (Holloway 2004). In a recent survey, 98 percent of DVR owners responded that they could not live without the DVR, and most thought that the DVR had improved their overall television experience (Giblin 2004).

Some observers think DVR usage has the potential to alter media consumption at the household level. For example, will the DVR lead people to spend more time with television because they can search

for a larger number of television programs that meet their specific interests? What, if any, are the implications of time shifting? Reports suggest that DVR owners are more likely to record fictional and reality programs to watch later, but still prefer to watch news and sporting events live. Does this have ramifications for the value of advertising in these program genres? Nielsen has already begun the process of including DVR usage data in its ratings reports. If at all, should DVR homes be measured differently than non-DVR homes, and if so, how? What about the social aspects of media consumption? For example, if people are time shifting the programs they watch at a higher rate than with the VCR, will this impact so-called "water-cooler" conversation the day after a major televised event, because some individuals will have recorded the program for later viewing (Holloway 2004)?

The Need for Research

Krugman (1985) called for an increased focus on how viewers consume media within the home, especially with respect to emerging media technologies. Along those lines, the present study explores whether and how the DVR impacts media usage at the household level. The primary objective of this study is to develop a theoretical model for DVR use within the home using qualitative research methods. This model will serve as the basis for future research to gain a better sense of the DVR's role within the home, to explain whether and how viewing patterns changed after DVR adoption, and to anticipate emerging trends in media consumption as ownership of the DVR and other new media technology increases. The insights gained from an in-depth look at the lives of DVR users will have implications for researchers, media organizations, the consumer electronics industry, and marketers.

Three Areas Examined

Three broad areas are explored with respect to DVR usage within the home. First, the research seeks to conceptualize the DVR from the standpoint of its users. Second, the DVR is classified according to three different models for studying new innovations: (1) its impact on preexisting consumption patterns (Robertson 1971; Krugman 1985); (2) its implementation by adopters (Shih and Venkatesh 2004); and (3) its innovative characteristics as perceived by adopters (Rogers 1995). Third, this research examines whether and how DVR use impacts the perceived role of television in the home, media consumption

activity, and the social aspects of media use. Each of these three areas is further explained in the following paragraphs.

Conceptual Issues

As noted above, the DVR records programs similar to the way a VCR does, except that it uses a computer hard drive to store programs. It also contains features not found in a VCR, including a searchable menu system for finding and scheduling programs and content manipulation features such as pausing and rewinding live television. Previous authors have suggested defining new media concepts such as interactivity from the perspective of the consumer (McMillan and Hwang 2002; Steuer 1992). Accordingly, the present study seeks to clarify the DVR concept from the standpoint of DVR users.

Examination of how owners conceptualize the DVR will begin by asking what DVR users think the concept means, how familiar they are with the concept, and whether they know the device by another name. The research will seek to further clarify the DVR concept by asking how users perceive the DVR in relation to other media technologies, such as VCRs, DVD players, and personal computers. Finally, DVR owners will be asked whether and to what extent they consider the DVR to be interactive.

Classifying the DVR as an Innovation

Three models have been used to characterize innovations. First, the Robertson (1971) model classifies innovations based on the degree of change to existing consumption patterns that result from adoption, and Krugman (1985) applied this model to new technology and media services. Innovations that lead to little or no change are classified as continuous, while those that create radical change or establish new patterns are called discontinuous. This study explores whether and how DVR use has impacted television viewing, time spent with television, use of other media, and non-media activities, to get a sense of whether and how the DVR has impacted behavior patterns.

Second, the use-diffusion model proposed by Shih and Venkatesh (2004) provides a useful framework for examining how innovations are implemented after the decision to adopt has been made. Using the dimensions of variety and rate of use, the authors propose a four-fold typology of use-diffusion orientations: intense, specialized, non-specialized, and limited. DVR users in the present research are

studied in terms of the number of different applications they have for the DVR (variety) and how often they use it, especially in relation to their overall television consumption (rate).

Rogers' (1995) five innovation characteristics serve as the third framework for characterizing the DVR from the perspective of adopters. First, relative advantage represents the degree to which an innovation is perceived as superior to the ideas that preceded it, such as whether the DVR is thought to be better than a VCR or whether it improves the overall television experience. Second, compatibility represents whether an innovation represents a good "fit" with the existing values, interests, lifestyles, and needs of potential adopters, such as consumers who have a general interest in technology, or those who are attracted to the potential benefit of more convenient television use. Observability represents the degree that an innovation can be observed, such as whether a non-owner has seen a DVR at a friend's house, and trialability is determined by whether a non-owner has the opportunity to use the innovation on a limited basis before deciding whether to adopt. Finally, complexity is the degree to which an innovation is perceived as difficult to use, and has the potential to hinder adoption and use of an innovation.

Media Consumption

The final broad area of consideration for this study is the DVR's potential impact on media consumption habits within the home. This will begin with an examination of whether and how the DVR has altered the perceived role of the television cluster within the home (see Morrison 1996). Second, DVR users will be studied with respect to media consumption activities including selectivity, preparation to watch television, competing and complimentary activities during television use, and attention to the set. Finally, the social aspects of media use in a DVR environment will be explored. Social aspects that will be studied include group versus individual media consumption, who is the primary user of the DVR in the home, who makes media use decisions in the home, rules for using media, the existence of a technology expert (see Morrison 1996), and internal and external social utilities for media use.

Overview of the Study

The second chapter of this study provides a detailed review of the literature that serve as the basis for 13 research questions that will guide the study. The literature review includes a synthesis of secondary

definitions for the DVR, interactivity, and interactive television, along with research questions addressing what DVR owners think these concepts mean. Next, literature on innovations is reviewed, with respect to impact on consumption habits, implementation orientation, and perceived characteristics. Finally, literature on the role of media clusters in the home, media use activities, and social aspects of media consumption are reviewed.

The third chapter outlines an exploratory, qualitative study using two data gathering techniques for examining DVR use in the home. Twenty-one DVR households were recruited for the study and participated in in-depth interviews on their media consumption habits and in-home observations of their DVR usage. The grounded theory approach to data analysis will be explained in the method chapter. Grounded theory is used to organize the data into categories for the purpose of developing a theoretical model for DVR use in the home (Glaser and Strauss 1999). The fourth chapter discusses the findings of the interviews and observations as they relate to the research questions posed in the literature review. Finally, the discussion chapter organizes the research findings into broader categories and proposes a model on whether and how DVR use changes the perceived media decision-making roles of its users. Implications of the findings for scholars, media, advertising, and other fields are discussed, along with limitations of the study and directions for future research on DVRs and other new media technologies.

CHAPTER 2

LITERATURE REVIEW

Conceptual Issues

The present study explores owner perceptions of what the phrase "digital video recorder" means and whether owners perceive the DVR to be interactive. This section reviews secondary definitions for DVRs, interactivity, and interactive television and poses research questions on how DVR owners define these concepts.

Digital Video Recorders

Based on a review of secondary definitions, a digital video recorder, or DVR, can be conceptualized as an electronic device that uses a computer hard drive to (1) record and store television programs and (2) allow a customized viewing experience for both recorded and live programming. Live programming in the present context refers to watching a program during its scheduled time as opposed to playing back a recorded version of the program at a later time. DVRs can be purchased as stand-alone units at consumer electronics and other retail outlets (Replay TV 2004a; TiVo 2004a), included in a cable or satellite television subscription (Adelphia Communications 2003a; Charter Communications 2004; Comcast Corporation 2004a; Cox Communications 2004; EchoStar, LLC 2004a; Insight 2004; TimeWarner Cable 2004), or built at home using special software installed on a personal computer (Kahney 2003). The present research focuses on those DVRs that were purchased for household use, either as a stand-alone unit or as part of a cable or satellite television subscription.

Table 2.1 summarizes DVR definitions given by different sources. Many definitions refer to the DVR's recording and customization capabilities. It is also useful to compare the DVR to other media technologies. Ten of the eleven definitions in Table 2.1 allude to the use of a computer hard drive when describing the DVR function of recording and storing television programming for later viewing (Adelphia Communications 2003a; Dell, Incorporated 2004; DigitalVideoRecorder.net 2003; Echo Star LLC 2004a;

Ferguson and Perse 2004; Fraser 2003; Spy Gadgets 2004; Time Warner Cable-Rochester 2004; TiVo UK 2004; Video Master 2004). Four of the definitions in Table 2.1 compare the DVR to a personal computer (Adelphia Communications 2003a; DigitalVideoRecorder.net 2003; Spy Gadgets 2004; Video Master 2004) and four compare it to a VCR (Dell Incorporated 2004; Echo Star LLC 2004; Roxio 2004; TiVo UK 2004).

Recording Features. The DVR contains both television recording and customization capabilities. Table 2.2a highlights the primary recording functions of the DVR. Recording functions include features related to selecting content and managing programs already recorded and stored on the hard drive. The DVRs sold by TiVo and Replay TV and those provided to cable and satellite subscribers generally include some sort of recording timer. DVR models vary in the number of program hours they are able to store, ranging from 30 (Comcast Corporation 2004b) to 320 hours (Replay TV 2004a).

DVR users may select programming from an on-screen program guide or from a search engine. The program guide is a grid-based schedule of television content that the user can view by pressing a button on the DVR remote control and allows the viewer to select programs to watch in real time or for future recording (Adelphia Communications 2003b; Comcast Corporation 2004a; EchoStar LLC 2004b; Replay TV 2004a; TiVo 2004a). Program information is downloaded by phone line (TiVo 2004a) or through the cable connection (Comcast Corporation 2004a).

The DVR search engine allows the user to browse categories such as movies or sports, or enter keywords such as titles, actor names, or topics in order to find programs that match the viewer's interests (Charter Communications 2004; Insight 2004; Replay TV 2004a; TiVo 2004a). This ability to match search terms to specific television programs is similar to the artificial intelligence capability of performing tasks based on pattern recognition (AI Depot 2002; McCarthy 2004; Artificial Intelligence 2005).

Users record programs by pressing a button on the remote control, and the DVR can automatically record every episode of a television program with the option of eliminating reruns (Adelphia Communications 2003b; Charter Communications 2004; Comcast Corporation 2004a; Replay

TV 2004a; Time Warner Cable 2004; TiVo 2004a). Some DVR models allow users to go online to schedule programs for recording from outside the home (Replay TV 2004a; TiVo 2004a). TiVo uses the artificial intelligence function of machine learning (McCarthy 2004; Artificial Intelligence 2005) to recommend programs based on the viewer's selection history (TiVo 2004a). For example , if a viewer frequently selects comedy programming for recording, the DVR will produce a list, which can be accessed by remote control, recommending other comedy programs.

The user manages recorded material through an on-screen menu that can be accessed through the remote control. Some DVR brands can detect program schedule changes (Replay TV 2004a). Other models have a dual tuner, which can record more than one show at the same time or allow the viewer to watch one live program while another is being recorded (Adelphia Communications 2003b; Charter Communications 2004; EchoStar LLC 2004c; Insight 2004; Replay TV 2004a; Time Warner Cable 2004; TiVo 2004a; TiVo 2004b). Finally, the viewer can delete prerecorded programming from the DVR in order to create free space on the hard drive for storing future recordings.

Customization Features. Besides advanced recording capabilities, the DVR includes various customizable features, such as the ability to pause, fast-forward, and rewind recorded or live programming (See Table 2.2b). DVR users can pause live television, which involves pressing a remote control button to freeze the screen during a real-time television broadcast. After the pause, the user has the option of resuming the program from the pause or fast-forwarding to catch up to real time. The length of the pause allowed varies by brand and model (Adelphia Communications 2003b; Charter Communications 2004; Comcast Corporation 2004a; Cox Communications 2004; EchoStar LLC 2004b; Insight 2004; Replay TV 2004a; Time Warner Cable 2004; TiVo 2004a).

DVR fast-forward capabilities take two forms. The first method is similar to the fast-forward feature on a VCR, in which the user can move through recorded material at a faster-than-normal speed (Cox Communications 2004; EchoStar LLC 2004c; Replay TV 2004a; TiVo 2004a). A second form of fast-forwarding available in some DVR models allows the user to skip approximately 30 seconds of prerecorded material at a time, which enables more substantial commercial avoidance than a traditional

fast-forward can offer (EchoStar LLC 2004c, Replay TV 2004a). DVR users can also watch live or prerecorded programming in slow motion (Comcast Corporation 2004a; Replay TV 2004a; TiVo 2004a).

The rewind feature on a DVR also generally takes two forms. The first is similar to the rewind function on a traditional VCR, except that users can rewind live or prerecorded programming to watch segments that they miss or misunderstand (Charter Communications 2004; Comcast Corporation 2004a; Cox Communications 2004; EchoStar LLC 2004c; Insight 2004; Replay TV 2004a; Time Warner Cable 2004; TiVo 2004a). A similar feature, instant replay, will automatically play approximately the last ten seconds of program material by pressing a remote control button (Charter Communications 2004; Comcast Corporation 2004a; EchoStar LLC 2004c; Insight 2004; Replay TV 2004a; Time Warner Cable 2004; TiVo 2004a).

DVRs may also include parental controls, which allow users to block or restrict access to certain channels by requiring the viewer to enter a code in order to see or record programs on that channel (EchoStar LLC 2004c; Insight 2004; Time Warner Cable 2004; TiVo 2004a). Other DVR models offer home networking options that allow communication between multiple DVR units of the same brand within a household. This setup allows viewers to record a program on one television set and watch the same program in another room. A user with this option could also begin watching a previously recorded program in one room, stop, and resume watching in another room (Replay TV 2004a; TiVo 2004a).

Two issues are crucial in conceptualizing the DVR from the user's perspective. First is the collection of features available through the DVR. DVR owners may focus on the ability to save programs on a hard drive instead of magnetic tape. Others may define the DVR in terms of program manipulation features such as the ability to pause or rewind live television. Consumers may also know the DVR by another term, such as the brand name TiVo. A second issue is how consumers think of the DVR in relation to other media. Many secondary definitions for the DVR mention VCRs and computers. Understanding how owners compare the DVR to other media technologies will further enhance our understanding of how users define the DVR concept.

RQ1a: What do DVR owners think the concept of "digital video recorder" means?

RQ1b: Do DVR owners know what a DVR is?

RQ1c: Do DVR owners know the device by another name?

RQ2a: Do DVR owners perceive the DVR to be similar or dissimilar to other media technologies?

RQ2b: In what sense do they perceive it as similar or different?

Are DVRs Interactive?

It is unclear whether DVRs represent an instance of interactivity from the perspective of DVR users. This paper explores DVR owners' perceptions of the concepts of interactivity and interactive television and whether DVR owners consider the DVR to be interactive. Whether the DVR is perceived as interactive will help in understanding interactivity in the in-home viewing environment, as perceived by the audience. Responses here could add to our discussion of how we define mediated interactivity.

Interactivity. Interactivity in a media environment can be characterized as either media-facilitated communication between persons (Ghose and Dou 1998; Ha and James 1998; Hoffman and Novak 1996; Liu and Shrum 2002; McMillan and Hwang 2002; Stewart and Pavlou 2002) or manipulation of the medium itself (Coyle and Thorson 2001; Ghose and Dou 1998; Hoffman and Novak 1996; Liu and Shrum 2002; McMillan and Hwang 2002; Steuer 1992; Stewart and Pavlou 2002). In addition, interactivity can be defined from the perspective of a firm that wishes to communicate with customers or other constituencies (source-oriented interactivity) or from the perspective of the individual consumer or audience member (audience-oriented interactivity) (Ha and James 1998). Hoffman and Novak (1996) also made a distinction between person interactivity, which occurs between people, and machine interactivity between a person and the medium.

Interactivity from the consumer perspective may include the elements of communication, audience control over the medium, and time. Communication in an interactive environment, as noted above, can be between persons and organizations or between persons and the medium itself. Ha and

James (1998) describe audience-oriented interactivity as possessing the characteristic of connectedness, or the sense of being linked to the outside world through a medium.

Audience control describes the ability of audience members to manipulate the mediated environment; the greater the number of options, the more consumers will perceive the medium to be interactive. Liu and Shrum (2002) describe this dimension of interactivity as "voluntary and instrumental action that directly influences the controller's experience" (p. 54). This sense of control can be enhanced by the presence of search engines and other features that allow the user to seek out interesting content as opposed to passively receiving a predetermined schedule of programming or editorial matter (McMillan and Hwang 2002).

Time relates to how quickly the medium responds to audience commands and can be synchronous or asynchronous. Steuer (1992) describes this dimension as speed, or "the rate at which input can be assimilated into the mediated environment" (p. 85). Other studies raise the issue of "whether information occurs in real time" (Hoffman and Novak 1996, p. 54) and the "degree to which…input…and the response…are simultaneous" (Liu and Shrum 2002, p. 55). Presumably, the more quickly the medium responds to user commands, the more interactive the medium will be perceived.

RQ3: What do DVR owners think "interactivity" means?

Interactive Television. Interactive television can consist of either two-way communication through the television set or expanded viewer options in terms of content or functions. Two-way interactive television can allow the viewer to perform a variety of tasks through the television set, such as request information, make purchases (Freed 2000), vote in online polls (Wisconsin Public Television 2000), or play games (BBC 2004). Expanded choices associated with interactive television may include control over the content and timing of television through so-called "video-on-demand" (Freed 2000).

Like the definitions provided in Table 2.1 for digital video recorders, definitions for interactive television often mention the convergence of television and computer technology into a single device (What is interactive television? 1999). Some interactive television definitions mention DVR-like functions including the ability to save programs on a hard drive (Swedlow 2000) and program

manipulation functions such as pausing live television programs (Burke n.d.). Interactive television can also provide enhanced program selection features (Bell Canada 1998) such as the ability to record programs by title, time, rating, actors, or theme (Freed 2000), similar to the DVR keyword search feature, or the availability of a program guide for selecting programs. Interactive television can also include the ability for television service providers and programmers to collect data as viewers make remote control selections (Burke n.d.).

RQ4: What do DVR owners think "interactive television" means?

Whether a person perceives the DVR as interactive may relate to how that individual defines interactivity and whether DVR features are perceived as an instance of interactivity.

RQ5a: Do DVR owners perceive the DVR as interactive?

RQ5b: In what sense do they perceive it as interactive or not interactive?

Categorizing Households Based on Technology Ownership, Use, and Perceptions

Various research traditions have enhanced our understanding of new technologies by focusing on their implications for consumer behavior and perceptions. Robertson's (1971) framework for classifying innovations based on their impact on consumption patterns has been used to study advanced media technologies such as VCRs, cable television, and computers (Krugman 1985; Morrison 1996). The use-diffusion model proposed by Shih and Venkatesh (2004) is useful for characterizing specific technology consumption patterns within the home and understanding the implementation of an innovation after adoption. Rogers' (1995) five innovation characteristics help in clarifying consumer attitudes toward innovations and explaining the decision of whether to adopt and how to use an innovation. These three research traditions collectively form a basis for further conceptualizing the DVR and developing an understanding of whether and how it impacts household media consumption.

Categorizing Households Based on Media Technology Ownership

Robertson (1971) gives three possible levels of behavioral change that an innovation may portend. A **continuous innovation** is one that requires only minimal change in existing habits. Switching from a VCR to a DVD recorder might be thought of as a continuous change. Although the two machines

differ in that one plays tapes and the other uses disks containing additional features, the basic behavior of recording and playing back programming remains the same. Krugman (1985) proposed that basic cable services represented a continuous innovation during the 1980s, with the expansion of viewing options and an increase in viewing.

A **dynamically continuous innovation** causes a moderate level of change, but it is similar enough to prior technologies that the effect is more along the lines of altering existing behavior than inventing new behavior (Robertson, 1971). Pay cable television in the 1980s can be classified as a dynamically continuous innovation because it offered more specialized viewing options for a premium price and introduced a non-commercial format into American television households that had been accustomed to free, advertiser-sponsored, over-the-air broadcasting (Krugman, 1985).

Discontinuous innovations bring radical changes in behavior, often creating completely new behaviors or dramatically changing the nature of prior activities (Robertson, 1971). The videocassette recorder has been classified as a discontinuous innovation because it transformed the television set into a device that could perform new functions of recording and movie rentals (Krugman, 1985). Television, when first introduced, was a discontinuous innovation because it introduced a previously unknown behavior into households, especially in developed nations.

It may be possible for different consumer segments to have different perceptions of where an innovation falls along this continuum of continuous, dynamically continuous, or discontinuous innovations. In the case of digital video recorders, consumers who are highly technology-savvy may be accustomed to using advanced media devices and therefore perceive little difference between DVRs and other electronic "gadgets" that they use. Other consumers may similarly perceive that the DVR is just a few steps removed from prior technologies such as VCRs, cable television, and the Internet. Individuals who are already comfortable with these technologies may not perceive DVRs as difficult to understand and use. On the other extreme, many consumers who are unfamiliar, or uncomfortable, with electronic technologies may find DVRs to be discontinuous.

RQ6a: How should we classify DVR homes?

RQ6b: Do the notions of continuous, dynamically continuous, or discontinuous hold for DVR homes?

Categorizing Households Based on Media Technology Use

There has been a focus in the literature on the implementation of innovations after adoption (Lewis and Seibold 1993; Rogers 1986; Rogers 1995; Shih and Venkatesh 2004). The adoption of an innovation is not merely a binary decision of accept or reject (Lewis and Seibold 1993). Rather, it is an ongoing process of decisions that continues through the implementation phase. Adopters often alter an innovation to meet individual wants and needs (Rogers 1995). This phenomenon has been studied at the organizational (Lewis and Seibold 1993) and household levels (Shih and Venkatesh 2004).

Rogers (1995) describes re-invention as "the degree to which an innovation is changed…by a user in the process of its adoption and implementation" (p. 174). Re-invention occurs frequently with new media products and services (Rogers 1986) and can include modification of the product or outright rejection of some components or functions. Users engage in re-invention as a way to simplify a product that is perceived as complex or to multiply the possible applications of the innovation to include a wider range of problems. The outcomes of this process can include fewer mistakes by the adopter and customization of the product to specific wants and needs. Adopters in this process are treated as active decision-makers, "struggling to give their own unique meaning to the innovation" (Rogers 1995, p. 179). For example, many individuals have experienced frustration upon adopting a personal computer for the first time, but eventually develop a satisfactory level of comfort and enjoyment from using the product as time passes (Rogers 1986).

Lewis and Seibold (1993) have studied implementation of innovations in an organizational setting. They identified two outcomes of the implementation process. Fidelity was described as a "match between design [or] intended use and actual use" (p. 323), and uniformity was defined as the "similarity across users" (p. 323), or the degree to which different users within an organization applied the innovation in the same manner and for the same purpose. Their findings suggested that innovation implementation is

a "œontinuous, dynamic process" (Lewis and Seibold 1993, p. 350) that occurs over time, that innovations are modified by adopters, and that implementation outcomes are influenced by organizational structure, implementation activities, and user characteristics. DVR adopters may similarly modify the innovation in different ways depending on household roles, individual personality traits, and unique uses for the DVR.

The use-diffusion model developed by Shih and Venkatesh (2004), in a study funded by a grant from the National Science Foundation, provides a useful framework for studying the implementation of new media technologies in the household (Table 2.3). The use-diffusion model proposes two dimensions of product consumption within the home. Variety of use is defined as the "different ways a product is used" (Shih and Venkatesh 2004, p. 60) and rate of use as the "time a person spends using the product during a designated period" (p. 60). These dimensions yield a four-fold typology of use-diffusion orientations. **Intense** use describes adopters who use the innovation in many different ways (high variety of use) and who use the product frequently (high rate of use). **Specialized** use involves frequent use of a product (high rate) but for only one or a few dedicated purposes (low variety). **Non-specialized** use involves highly varied but infrequent use (low rate), and **limited** users are individuals who use the product infrequently and for few purposes (Shih and Venkatesh 2004).

In their study, Shih and Venkatesh (2004) operationalized variety of use as a checklist of computer uses and rate of use as the number of hours spent with computers by family members in a given week. One of their key findings was that use-diffusion orientation was related to an individual's relationship with technology. Intense users, for example, expressed greater satisfaction with the personal computer, held a stronger belief that the technology had impacted their family life, and were more likely to view the computer as a necessity.

The use-diffusion model can be adapted to the study of different new media technologies (Shih and Venkatesh 2004). DVR use, like computer use, can be studied in terms of the number of applications adopters have for the device (variety of use) and the frequency with which they use it (rate of use), especially in relation to overall television use. In terms of use variety, some users may watch a large number of programs and employ multiple program selection features (program guide, menus, and

keyword searches) to find and set recordings, in addition to multiple program manipulation features like pausing and rewinding. Others may have only a few shows that they watch or only use one of the selection features to set recordings, which would indicate a lower variety of use. Rate of use might be indicated by both how much time a user spends with the DVR and how much of his or her time with television overall is spent using the DVR specifically. An understanding of how the DVR fits into the use-diffusion model will shed light on how adopters implement this particular new media innovation.

RQ7a: Can DVR use within the home be classified as intense, specialized, non-specialized, or limited?

RQ7b: How can DVR homes be characterized in terms of variety of use?

RQ7c: How can DVR homes be characterized in terms of rate of use?

RQ7d: Where does time spent with the DVR come from?

Perceived Innovation Characteristics of the DVR

Rogers (1995) discusses characteristics of innovations that tend to indicate the likelihood of ultimate acceptance by individuals or other adopting units. These key characteristics are perceived relative advantage, compatibility, trialability, observability, and complexity.

Relative Advantage is the "degree to which an innovation is perceived as being better than the idea it supersedes" (Rogers 1995, p. 212). With respect to the DVR, some consumers may perceive deficiencies in current television programming and technologies such as VCRs and cable or satellite services. These individuals may accept the DVR as an improvement over these current offerings. Others may be perfectly happy with traditional television or with the standard VCR-cable set up that has been common since the 1980s and not perceive the DVR as offering any meaningful enhancement.

Compatibility represents the "degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" (Rogers 1995, p. 224). Consumers who are avid users of technologies such as the Internet, wireless devices, and video gaming equipment may find DVRs to be compatible with their existing values and lifestyles. On the other hand, viewers who

consider television to be a relaxing, "lean-back" medium or those who feel anxious with respect to new technologies may be wary of using a DVR.

Observability and Trialability. Observability is "the degree to which the results of an innovation are visible to others" (Rogers 1995, p. 244). This could be a question of whether an individual has visited the home of a friend or relative who owns a DVR and has had the opportunity to observe the device in use. Learning about the DVR through second-hand sources including word-of-mouth, media articles, in-store promotions, and advertising may also provide another form of observability. Trialability is "the degree to which an innovation may be experimented with on a limited basis" (Rogers 1995, p. 243). An example would be whether a potential adopter has the opportunity to use a DVR at the home of another person.

Complexity is the "degree to which an innovation is perceived as relatively difficult to understand and use" (Rogers 1995, p. 242). Complexity is the one innovation characteristic that typically has a negative effect on the decision to adopt and use a new product, particularly with new media technologies. As noted, many viewers think of television as a relaxing medium, and the DVR's menu system and control functions may violate that expectation. This may lead to negative perceptions that the DVR could interfere with a pleasant viewing experience.

RQ8: What are user perceptions of the DVR in terms of (a) relative advantage, (b) compatibility, (c) observability, (d) trialability, and (e) complexity?

Media Consumption

Role of Media Clusters in the Home

Prior studies have recognized the existence of media clusters within the home (Morrison 1996; Morrison and Krugman 2001). Media clusters consist of an anchor technology, such as the television or computer, attached to one or more dependent technologies, such as a DVD player or printer. Like DVD players and printers, the DVR is a dependent technology that cannot be used as intended unless attached to the anchor technology within the media cluster. Media clusters are perceived as having both technological and social symbolism for individuals within the home. The television cluster, for instance,

often serves as a gathering area for family members and is described by adjectives such as "warm and cozy" (Morrison and Krugman 2001, p. 142). Users perceive the computer cluster as a work environment characterized by a small office space for use by one person at a time (Morrison and Krugman 2001).

It is unclear whether or how the DVR influences the perceived role of the television cluster. Viewers may perceive the DVR as merely an enhanced VCR that gives them the ability to select and record programs through an on-screen menu instead of using VHS tapes. Others might perceive the on-screen menu as being similar to a point-and-click environment commonly found on the Internet, and the ability to pause and rewind live programming could also create a perception of computer-like qualities being added to television. However, the impact of DVRs on the role of the television cluster may be limited, given the traditionally separate perceptions of television as a relaxing medium and the computer as a work tool (Morrison 1996; Morrison and Krugman 2001).

RQ9a: What is the perceived role of the television cluster in DVR homes?

RQ9b: Does the perceived role of the television cluster in the home change with the addition of a DVR?

Media Consumption Activities

Selectivity. Selectivity can be conceptualized as an individual's decision-making process with regard to media consumption, or "the degree to which a person intentionally sought to enter the communication setting" (Levy and Windahl 1984, p. 62). Lin (1993) defined viewing selectivity as selection planning on the part of the television viewer and suggested that selectivity plays a role in viewing involvement and gratifications obtained from media consumption. Kim and Rubin (1997) further cast selectivity, or selective exposure, as the "intentional choice of messages" (p. 108).

Prior studies on media technologies such as VCRs and cable television indicate a potential relationship to selectivity. Levy (1987) found that over two-thirds of respondents indicated a high or medium-high level of planning in advance of deciding which TV programs to record on the VCR. Another study suggested that heavy VCR users tended to watch a greater diversity of television genres (Van den Bulck 1999). In the case of cable television, Lin (1994) found that adopters of premium cable

channels such as HBO were more likely to consult programming guides such as *TV Guide* than their non-cable counterparts, indicating greater involvement in the selection of what to watch. However, the same study indicated no difference between premium and basic cable subscribers in terms of program guide use, and no difference between cable and non-cable households in terms of planning viewing ahead of time (Lin 1994).

The digital video recorder has the potential to alter program selection behaviors, in light of DVR features such as searching for programs using a "wish list" and the ability to select programs for recording from an on-screen list of titles rather than by looking at a printed program schedule. On the other hand, these DVR features may simply be a complement or substitute for more traditional program information sources such as *TV Guide* or newspaper television schedules, and therefore have little effect on selectivity.

RQ10a: How can DVR households be characterized in terms of selectivity?

Preparation before Media Use. In a study comparing consumption of traditional television to VCR movie rental viewing, Krugman and Johnson (1991) found an indication that viewers engage in more preparation activities before watching movie rentals. Preparatory activities include such behaviors as preparing meals or snacks, finishing chores or other work-related tasks, or making sure other household members are present for the beginning of the viewing activity. In the case of DVRs, viewers typically have prerecorded programs stored on a computer hard drive. This allows the viewer to begin, pause, and resume watching a prerecorded program at any time, in addition to the ability to pause and rewind live programming. Because of this, the viewer has the option of engaging in other activities as long as needed or desired, without having to be in front of the set at a certain time, and therefore may engage in more preparatory activities prior to viewing. On the other hand, because many of the prerecorded programs are typically standard television programs and not movies, DVR owners may not feel any need to engage in special preparatory activities prior to viewing. The present study considers whether or not DVR users are inclined to engage in preparatory activities prior to viewing programs using the DVR and whether this activity has changed since getting a DVR.

RQ10b: How can DVR households be characterized in terms of preparation before media use?

Competitive and Complementary Activities. Viewers often engage in other activities while consuming media content. These activities can be classified as either competitive or complementary. Competitive activities are those which take a person's attention away from focusing on media content, such as talking on the telephone, reading, or doing chores. Complementary activities are those that do not necessarily take the viewer's attention away from the medium. Eating while watching television and talking back to the set are examples of complementary activities.

Prior studies indicate different levels of competitive and complementary activities associated with different media consumption contexts and that viewer perceptions of a media environment may influence the level of activity during viewing. Activities while viewing also have implications for the level of attention that viewers pay to programming, with attention measured as the percent of time that an individual's eyes are directed toward the screen. Competitive activities such as reading, chores, or performing hobbies are more common when viewing traditional broadcast television than when watching movie rentals, while complementary activities are unrelated to whether the viewer is watching a movie rental or traditional program (Krugman and Johnson 1991). Preparing meals, talking on the telephone, and performing hobbies while watching VCR movie rentals are more common among viewers who perceive movie rentals to be similar to traditional broadcast television than with viewers who perceive movie rentals to be like a cinema environment (Krugman, Shamp, and Johnson 1991). Krugman, Cameron, and McKearney White (1995) found that competitive activities were negatively correlated with the amount of time that a viewer's eyes are directed towards the television screen, while complementary activities have no effect on eyes-on-screen measures.

The ability to pause or rewind live television may give DVR users the freedom to interrupt their viewing to engage in activities that traditionally have been considered competitive to media use. For example, if the telephone rings while the viewer is watching a live television program, she can simply press the pause button and take the call without missing the program. In such a situation, talking on the

telephone loses its competitive characteristics, because the viewer can resume watching where she left off, after she hangs up the phone. In addition, the ability to select programs by title and record programs that fit specific categories of interest may encourage more attentive viewing with fewer competitive or complementary activities.

RQ10c: How can DVR households be characterized in terms of competing and complementary activities?

Attention to the Set. The amount of attention that viewers pay to the television set, measured as the percent of time that the person's eyes are directed toward the screen during a program, has been shown to vary based on different television viewing situations. While eyes-on-screen time for traditional television viewing has been measured at about 60 percent (Allen 1965; Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991), a rate of 81.7 percent has been found for VCR movie rental viewing (Krugman and Johnson 1991). Attention to the set drops to about 33 percent during commercial breaks (Krugman, Cameron, and McKearney White 1995).

The fast-forward or commercial skip button may have an impact on audience attention to advertising messages in a DVR environment. Because DVRs allow viewers to record specific titles and program genres of interest, higher eyes-on-screen times may be observed during television program viewing. However, the ability to pause and rewind programs allows the viewer to stop the program for interruptions such as phone calls or to repeat program material that is missed or not understood clearly. This may give the DVR viewer the freedom to pay less attention to the set, because she can either stop the program or go back and watch a misunderstood portion again.

RQ10d: How can DVR households be characterized in terms of attention to the set during commercial breaks and television programming?

Social Aspects of Media Use

Media consumption can be treated as a social activity with implications both inside and outside of a person's household (Lull 1990). To further understand the potential impact of the DVR in the home, the present research considers three areas related to social aspects of media use. First, social roles that can

relate to media use include group versus individual viewing, whether one household member is the primary media user, who decides what content to consume, and whether any rules exist for media use. Second, this study considers whether a technology expert exists within the home, and finally, the internal and external social utilities associated with media use.

Social Roles within the Home. Social roles within the home that relate to media use include whether household members consume media alone or together and who is the primary media user. Television in particular is viewed as having a social role within the home. In terms of family relations, television can be used for either affiliation with other family members through sharing a program together, or avoidance through going into one's room and watching alone. This dual role as a facilitator of family togetherness or separation relates to using television for physical contact or neglect, family solidarity, or companionship (Lull 1990). Different media clusters can assume different social roles within the home. Morrison and Krugman (2001) report that while the television cluster is largely perceived as a gathering area for use by more than one person, the computer cluster is typically perceived and arranged for use by only one person at a time. Television is thus seen as a more communal medium, while the computer is seen as providing an opportunity for solitary activity.

Different media contexts and household characteristics can influence who uses television and whether programs are watched alone or with others. In terms of different media contexts, Krugman, Shamp, and Johnson (1991) found that respondents who perceive VCR movie-rentals to be like going to a theater are more likely to watch the movie with others than those who perceive the movie rental to be like traditional television. Morrison (1996) reported that different program genres lend themselves to solitary or communal viewing. Narrowly targeted programs such as documentaries or special events are more likely to be viewed by one person, whereas sitcoms and television movies tended to be viewed with a group.

Household factors that can influence social television use include family communication orientation and architecture of the home. Lull (1990) suggests that in so-called socio-oriented families, where children are encouraged to get along with others and give in on arguments, television is more likely

to be used as an agenda for talk and for family solidarity. In concept-oriented families, children are encouraged to express their own ideas and challenge others' opinions. These households are less likely to use the television as a basis for conversation. Pardun and Krugman (1994) report that in homes with traditional architecture, which focuses on privacy, family members are more likely to use television alone. In transitional homes, which emphasize communal living space, families are more likely to watch television as a group.

On one hand, the DVR has the potential to encourage group viewing within the household because of the ability to select specific shows that appeal to everyone and to time shift the viewing so that it is convenient for all household members. On the other hand, individuals may find themselves selecting programs on narrow topics of interest that do not appeal to others within the home, and therefore end up watching more television alone. A related issue is whether one family member tends to use the DVR more than others or if DVR use is spread evenly among different household members.

Through in-home observations, Lull (1990) found that the father controlled viewing decisions in most family viewing contexts. During interviews conducted for the same study, fathers perceived that the mother or children controlled the viewing decisions. This indicates that the perception of "who controls the remote" can differ from reality. Furthermore, in concept-oriented homes, family members were more likely to be sensitive to others' opinions in selecting programs, making the choice of what to watch more of a joint decision between household members. In these households, an individual was less likely to watch a program that she did not select than in socio-oriented homes, which exhibited less sensitivity toward other family members when deciding what to watch (Lull 1990).

The DVR may serve as a basis for more individual control over program selection because family members can find and record programs of specific interest to them, rather than having the decision made by one person. Another possibility is that family members make a joint decision to select programs that they can watch together, or adults within the home may use features such as parental control to restrict the viewing choices of their children.

Setting rules for media use can be a way for household members, particularly adults, to serve as decision makers for the home. Setting rules can be related to the role of competence or dominance, whereby the head of household engages in exercising authority and gatekeeping for the rest of the family, children in particular. This serves to reinforce social roles within the home (Lull 1990).

Morrison and Krugman (2001) found that rules vary among media clusters and household technology levels. Rules for using television typically concern the types of content that can be selected, the amount of time children are allowed to watch, and the specific days and times for watching. Computer rules are more related to protecting the technology from damage, and include restricting food near the computer. Furthermore, homes with a higher level of technology were more likely to employ rules to protect the computer and had more rules for television use, including chores before watching, having to ask permission to watch, and specific days for viewing.

Because the DVR incorporates a hard drive and a menu driven search interface, owners may perceive the technology to be like a computer and set rules to protect it from damage, similar to the computer usage rules in high-technology homes (Morrison and Krugman 2001). However, because it is part of the television cluster, viewers may only set rules for content and specific times allowed for viewing. DVR owners may also set rules specific to the technology, such as courtesies for deleting recordings and avoidance of filling up the hard drive space.

RQ11: How can DVR households be characterized in terms of (a) group versus individual viewing, (b) who uses television, (c) who decides what to watch, and (d) rules for using television with the DVR?

Existence of a Technology Expert. Morrison (1996) reports that advanced media technologies "facilitate the emergence of a perceived technology expert in the home" (p. 191). This person is not necessarily the most technology-proficient person, but is rather the individual who is most knowledgeable about a specific technology, such as the personal computer. The role of expert also tends to fall to whoever happens to be present whenever questions arise about how to perform a function or fix a

problem. In addition, the expert tends to be a "visionary" (Morrison 1996, p. 195) who conceives of a higher level of uses for a technology than non-experts do. The expert can be male or female.

The expert generally serves in the role of technology teacher, who helps other household members learn to use a newly acquired technology. Another job of the expert is the maintenance of the technology, such as responsibility for upgrades and fixing problems. One outcome of the presence of the expert is that usage of a particular technology within a household tends not to advance beyond the level of knowledge of the expert (Morrison 1996). Because the DVR incorporates some computer elements in a television peripheral device, there may be one person in the home who is more adept at using computers who emerges as the DVR expert within the home. If other household members perceive the DVR as complex, this person's role may be of some importance. If the DVR were perceived as easy to use, however, the role of the expert would be limited.

RQ12: In DVR homes, is there an individual within the family who is considered the expert for the DVR?

Internal and External Social Utilities. The social aspects of media use also include the concepts of internal and external social utilities. Lull (1990) suggests that using television presents the opportunity for conversational entrance and verbal contact with other persons through discussions about content and other media-related topics. Internal social utility relates to interaction among household members with respect to media use, and external social utility represents interactions about media-related topics with persons outside the household (Morrison and Krugman 2001).

The literature suggests that television facilitates socialization more than the computer does. Television viewing often occurs with other family members in the room, and the act of spending time together often outweighs interest in watching a specific program. Watching VCR recordings or movie rentals tends to be even more strongly related to group viewing. The computer, by contrast, tends to be used by one person at a time for work purposes and is generally arranged in a setting appropriate for solitary use as opposed to group activity (Morrison 1996). Because the DVR is a television-related technology, it has the potential to enhance internal social utility through discussions about what to record

and family viewing of programs. An alternative outcome would be that each household member crafts his or her own customized viewing schedule, lessening the opportunity for interpersonal interaction during media consumption.

External social utility involves two aspects. The first would be having visitors to the home, such as relatives and friends, watch television with household members. The second would be discussions about television viewing with associates outside the home, such as Monday-morning conversations about the previous weekend's football games (Morrison 1996; Morrison and Krugman 2001). Children tend to be more concerned with external social utility than are adults, as they fear being ostracized by their peers for not being familiar with the "right" programs. An example of external social utility with the computer would be sending e-mail to persons outside the home (Morrison 1996).

It seems intuitive that relatives and friends visiting the home would have the opportunity to observe or perhaps use the DVR for themselves. This may depend on factors such as the willingness of the owner to allow others to "tinker" with the DVR, concerns about whether an unfamiliar guest would "mess up" the DVR settings, and the comfort level of the visitor in trying the technology. As for discussions outside the home, DVR owners who save programs for later viewing may find themselves less up-to-date than their peers on what happened on a television program. It is also possible that members of DVR households may find themselves discussing their use of the technology with fellow owners, or answering questions about the technology from non-owners.

RQ13: What is the perceived internal and external social utility of the DVR?

Table 2.1: What is a DVR?

Definition	Source	Link
"A DVR is a digital cable set top box with a built-in hard drive, similar to that found in a personal computer, that digitally records video broadcasts."	Adelphia Communications, 2003a.	http://www.adelphia.net/cable_entertainment/dvr_faqs.cfm
"A digital video recorder is like a VCR, but with a hard drive and without the hassles of videotapes or timers"	Dell Incorporated, 2004.	http://www1.us.dell.com/content/topics/segtopic.aspx/tivo_main?c=us&cs=19&l=en&s=dhs
"A hard drive built into your digital converter box lets you record, pause, rewind and instant replay live programming"	Time Warner Cable-Rochester, New York, 2004.	http://www.twrochester.com/products/dvr.cfm
"This advanced receiver contains a huge internal hard drive that can record up to 100 hours without videotape"	Echo Star LLC, 2004a	http://www.dishnetwork.com/content/getdish/what_is/index.shtml
"A digital video recorder (DVR) is a computerized system that records video pictures digitally [onto a] hard disk drive"	Spy Gadgets 2004	http://www.spygadgets.com/dvrfaqs.htm
"Digital V ideo Recorders (DVR) compress and store images to a computer hard drive using various compression techniques"	DigitalVideoRecorder.net, 2003	http://www.digitalvideorecorder.net
"Also known as a 'digital video recorder' (DVR) or 'hard disk recorder,' a PVR is a consumer device that digitizes broadcast TV onto a hard disk and plays it back immediately, allowing the viewer to pause at any time and return later"	Fraser, 2003.	http://www.bsu.edu/web/MAFRASER/techno.html
"A…dgital video recorder is a set-top box, about the size of a VCR, which uses a hard disk drive instead of videotape to record programmes"	TiVo UK, 2004.	http://www.tivo.co.uk/3.2.asp
"DVRs are basically hard disk drives, like the one in your PC, with a video capture device."	Video Master 2004.	http://www.videomaster.net/Products_Services/Digital_FAQs/digital_faqs.html
"A Digital Video Recorder (DVR) is just like a video cassette recorder (VCR) that doesn't need tapes."	Roxio, 2004.	http://www.roxio.com/en/products/eyetv/faq.jhtml

Table 2.1: What is a DVR? (Continued)

Definition	Source	Link
"Uses a hard disk to store compressed video, thus allowing simultaneous recording and playback of the same program without regard to linear time"	Ferguson and Perse, 2004.	http://www.jiad.org/vol4/no2/ferguson/index.htm

Table 2.2a: Summary of DVR Recording Features

Feature	**Description/Variations**	**Brands/Sources**
Program guide	On-screen schedule of television content from which the user selects a program for recording.	Replay TV, 2004a. TiVo, 2004a. EchoStar LLC, 2004b. Comcast Corporation, 2004a. Adelphia Communications, 2003b.
Search engine	Feature which allows the user to enter various words, using the DVR remote control, to seek program of interest Replay TV—search by actor, director, title, subject TiVo—actor, director, sports team, topic Charter—title or genre Insight—title	Replay TV, 2004a. TiVo, 2004a. Charter Communications, 2004. Insight, 2004.
Record every episode	Option for the viewer to command the DVR to automatically record every episode of a program. Some DVRs allow the further option of recording only first-run episodes and skipping reruns.	Replay TV, 2004a. TiVo, 2004a. Time Warner Cable, 2004. Comcast Corporation, 2004a. Charter Communications, 2004. Adelphia Communications, 2003b.
Online Scheduling	Ability for the user to log onto a Web site from outside the home where the DVR is located and select programs for recording	Replay TV, 2004a. TiVo, 2004a.
Program Recommendations	Button on the DVR remote that allows the DVR to search for and create a list of programs based on a viewer's past selections.	TiVo, 2004a.
Dual Tuner	Includes one or both of two features: 1. Record more than one show at the same time (Replay TV, DirecTV with TiVo, Dish, Time Warner, Charter) 2. Watch one program while the DVR is recording one or more others (TiVo, Dish, Time Warner, Charter, Insight, Adelphia)	Replay TV, 2004a. TiVo, 2004b. TiVo, 2004a. EchoStar LLC, 2004c. Time Warner Cable, 2004. Charter Communications, 2004. Insight, 2004. Adelphia Communications, 2003b.
Detect Program Schedule Changes	Ability for the DVR to automatically adjust recording time for a selected program due to network scheduling changes	Replay TV, 2004b.
Storage capacity	The number of hours of programming that can be stored on the DVR hard drive. Varies by brand and model Replay TV—40, 80, 160, or 320 hours TiVo—40, 80, 140 hours Dish—60, 90, 100, 180 hours Comcast—30 hours Charter—60 hours Insight—40 hours	Replay TV, 2004a. TiVo, 2004c. EchoStar LLC, 2004d. Comcast Corporation, 2004b. Charter Communications, 2004. Insight, 2004.

Table 2.2a: Summary of DVR Recording Features (Continued)

Feature	**Description/Variations**	**Brands/Sources**
Buffer	Feature in which the DVR saves program material that occurred before the television set is turned on, so that the user can rewind and watch material she may have missed. This feature typically only works on the channel the set first tunes to when it is turned on. Changing the channel after turning on the set usually cancels the buffer. The length of the buffer varies. Replay TV—2 hours Dish—2 hours Insight—10 minutes	Replay TV, 2004a. EchoStar LLC, 2004c. Insight, 2004.

Table 2.2b: DVR Customization Features

Feature	Description/Variations	Brands/Sources
Pause Live Television	The user may press a button on the DVR remote control to freeze the screen during a real-time television broadcast. After the pause, the user has the option of resuming the program from the pause or fast-forwarding to real time. DVR brands vary in the length of pause allowed.	Replay TV, 2004a. TiVo, 2004a. EchoStar LLC, 2004b. Time Warner Cable, 2004. Comcast Corporation, 2004a. Cox Communications, 2004. Charter Communications, 2004. Insight, 2004. Adelphia Communications, 2003b.
Fast-forward	Ability for the user to skip forward in one or both of two ways: 1. The first method is similar to the fast-forward on a VCR in which the user moves through recorded material at a faster-than normal rate (TiVo) 2. The second method allows the user to skip an entire block of seconds at a time (Replay TV, Dish)	TiVo, 2004a. Replay TV, 2004a. EchoStar LLC, 2004c. Cox Communications, 2004.
Rewind	Allows the user to move backward at a high rate of speed to rewatch recorded material or real-time broadcast.	Replay TV, 2004a. TiVo, 2004a. EchoStar LLC, 2004c. Time Warner Cable, 2004. Comcast Corporation, 2004a. Cox Communications, 2004. Charter Communications, 2004. Insight, 2004.
Instant replay	A form of rewind in which the DVR automatically plays approximately the last 10 seconds of a real-time broadcast or recorded material.	Replay TV, 2004a. TiVo, 2004a. EchoStar LLC, 2004c. Time Warner Cable, 2004. Comcast Corporation, 2004a. Charter Communications, 2004. Insight, 2004.
Slow Motion	Allows the viewer to watch recorded material at a reduced rate of speed	Replay TV, 2004a. TiVo, 2004a. Comcast Corporation, 2004a.
Parental Controls	Allows the user to block or restrict access to shows or channels, requiring a code to view.	TiVo, 2004a. EchoStar LLC, 2004c. Time Warner Cable, 2004. Insight, 2004.

Table 2.3: Use-Diffusion Orientations for New Media Technologies

		Variety of Use	
		High	**Low**
Rate of Use	**High**	Intense	Specialized
	Low	Non-Specialized	Limited

Source: Shih and Venkatesh (2004).

CHAPTER 3

METHOD

This study combined two qualitative methods to examine the role of digital video recorders in the home. More specifically, the present exploratory research used depth interviews and in-home observations to learn about the activities and perceptions of DVR owners. Depth interviews are useful tools in addressing many of the research questions that were posed in the literature review. In-home observations complement interview questions related to media behavior and household viewing patterns. This chapter includes a discussion of the qualitative methods used, participant selection and recruitment, and data gathering and analysis procedures. All data gathering activities were performed by the sole researcher, who authored the present study.

Explanation of Qualitative Methods

Qualitative methods are useful to the present research for three key reasons. First, qualitative approaches have proven fruitful in prior studies on emerging phenomena such as VCRs (Krugman and Johnson 1991) and other advanced media technologies including video game consoles, computers, and online services (Morrison 1996). Rogers (1986) has proposed that the emergence of new media technologies requires scholars to re-examine prior communication theories at a minimum, and further, to look for new perspectives that may be more appropriate. The introduction of new media technologies into the home has been associated with changes in media consumption patterns, and as these patterns change, "our existing knowledge of television programming and advertising becomes less relevant" (Krugm an 1985, p. 24). Technologies such as the DVR present such a need for development and extension of theories of audience behavior. Qualitative methods are well suited for allowing theoretical models to emerge from the data (Glaser and Strauss 1967).

Second, the current study seeks to examine a phenomenon with little prior research on which to build. Pardun (1992) similarly found qualitative interviews to be useful in studying the relationship

between the architecture of the home and television use within the family. Her in-depth interviews revealed different perceptions of the role of television and family viewing styles based on whether the family lived in a transitional or traditional home. This was an issue that had been neglected in prior studies. Similarly, there is currently a lack of literature on the role of the DVR in shaping television viewing in the home, and the findings of the current study will serve as a basis for future research and theory-building with respect to new media technologies in the home.

Third, qualitative methods have been used extensively in research on media consumption, especially with regard to electronic media technologies (Anderson, Lorch, Field, Collins, and Nathan 1986; Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991; Krugman, Shamp, and Johnson 1991; Lindlof, Shatzer, and Wilkinson 1988; Lull 1990; Morrison and Krugman 2001; Pardun and Krugman 1994). Studies combining qualitative and quantitative methods have been used to examine activities during television consumption (Krugman, Cameron, and McKearney White 1995) and VCR movie rental viewing (Krugman and Johnson 1991). Interviews and in-home observations have produced findings on VCR use (Lindlof et al., 1988) and social roles of television within the family (Lull 1990), as well as previously cited studies by Morrison (1996) and Pardun (1992).

Depth Interviews

Depth interviews have been used extensively in examining media consumption in the home (Lull 1990; Morrison 1996; Pardun 1992). Through the use of interviews, Lull (1990) identified various social uses of television within the home, different family communication orientations, and how such communication orientations influence the social uses of media that are important in different families. Socio-oriented families, the study found, place an emphasis on getting along with others and avoiding controversy; such families tend to use television to facilitate family solidarity, to reinforce social roles in the home, and as an agenda for conversation. Concept-oriented families, by contrast, encourage individuals to express themselves and challenge others' opinions; television in such families serves as a means for transmitting values to children, exercising authority in the home, and facilitating arguments.

Morrison (1996) examined different media consumption and perceptual patterns in households based on the level of advanced media technologies present in the home. Depth interviews revealed that families differed in their conceptions of "interactivity" based on whether they owned continuous/dynamically continuous (C/DC) or discontinuous technologies. C/DC family members defined interactivity to include such functions as virtual reality and many television-related features, while persons living in discontinuous homes had a more narrow conception of interactivity, focusing mainly on the features of online services. The present research addresses how DVR owners define the concepts of digital video recorders, interactivity, and interactive television.

Similarly, Pardun (1992) used interviews to uncover different orientations toward television based on whether a family lives in a transitional or traditional home. Families in transitional homes, which place an emphasis on large communal areas within the house, tended to watch television together more often and viewed the device as a magnet for drawing individuals toward the hub of the home. Families in traditional homes, which contain more enclosed rooms for an emphasis on individual privacy, watched television alone more often and used the medium as a way to maintain calmness in the home.

In-Home Observations

In-home observations have been used to study age differences in family television viewing (Anderson, et al. 1986), attention to the set, activities during media consumption (Krugman, Cameron, and McKearney White 1995), and VCR use (Krugman and Johnson 1991). Anderson et al. (1986) employed video cameras in the living rooms of participating families to record the television-related behavior of different family members, and found, for example, that children gradually watch more television as they grow through their elementary years, with use tapering off as they become teenagers.

Krugman, Cameron, and McKearney White (1995) used the presence of a covert observer to record attention to the set and activities that take place while household members watch television. Student observers entered the homes of family or friends, pretended to do homework while others in the room watched television, and discretely recorded the relevant data onto coding sheets. Subjects were debriefed following the recording of data. Among the study's findings were that viewers' eyes were

directed toward the screen about two-thirds of the time during programming but only one-third of the time during advertising.

In an earlier study on VCR movie rental activities, Krugman and Johnson (1991) used in-home observations and found that eyes-on-screen increased to over 80 percent when family members are viewing a rented movie. The same study also found that movie rental viewers engage in fewer competing activities such as housework while viewing rented movies than they do while watching regular television programs. As noted in the research questions in the previous chapter, the present research examines similar eyes-on-screen and activities-while-viewing data for DVR users. These attention measures recorded in previous studies were compared with the findings of the present research as a possible indicator of the impact of the DVR on media use.

Study Participants

Unit of Analysis

The unit of analysis for the present study was defined as individuals who are members of households in which a DVR is present. The researcher recruited a primary participant from each household contacted. The primary participant was identified as the household member with the greatest affinity toward the DVR and who was at least 18 years of age. Three criteria were used to identify the person with the greatest affinity for the DVR, in order of greatest priority. The first priority was given to the adult who was the primary DVR user within the home. All primary users were at least 18, but had the primary DVR user been underage, then the researcher would have asked for the purchaser of the DVR or the primary influencer in the purchase decision. Participating households had to contain a DVR that had been purchased as a stand-alone unit or included as part of a cable or satellite subscription service. Home-built digital recording systems using a personal computer adapted to receive television signals were not included in the present study.

In her study on the role of advanced media technologies in the home, Morrison (1996) selected individuals who were members of either continuous/dynamically continuous or discontinuous homes in terms of the level of technology present. She explained that media use occurs primarily in the home,

within a family context, and so it is important to examine both (1) individual behavior within the family and (2) how family members influence each other in terms of media consumption. Pardun (1992) included both individual family members and the family as a whole as her units of analysis. In her study, the family was treated as a system of interrelated parts, with primary emphasis on married couples with children.

Criteria for Selecting Participants and Recruitment Procedures

To qualify for selection as the primary participant within a household, recruits had to be at least 18 years of age and be considered the head of a household in which a DVR is present. They also had to be identified as having the most affinity for the DVR within the home, based on being the primary user, purchaser, or influencer of the purchase decision. Once contact was established and two research sessions scheduled with the primary participant, other members of the household were invited to participate if they were present for the study. To locate potential participants, the researcher contacted organizations whose members were deemed likely to fit the selection criteria, such as PTA groups and religious organizations. In some cases, personal acquaintances of the researcher provided names of potential recruits. Secondary methods employed to gather a sufficient pool of potential recruits included flyers posted on organization or community bulletin boards, or messages on organization listservs or on-line bulletin boards. Appendix A contains the text of the message on the flyers and listserv postings.

Names and contact information for potential study participants were included on an initial list compiled during the recruiting process. For recruiting through organizations, the researcher identified a contact person within the organization who already had a rapport with members (Pardun 1992). This person either made the initial contact to verify whether a qualifying member was interested in participating or gave the researcher permission to post a flyer or listserv message, or to have an announcement included in a newsletter. As potential participants were identified, the researcher called or e-mailed these individuals to verify interest and to identify the adult household member with the greatest affinity for the DVR. The researcher explained that she would be visiting the participant's home over two days, at the participant's convenience, to collect data. If the potential recruit was still interested, an

attempt was made to schedule a tentative date for the researcher to visit the participant's home. Participants were offered an $80 honorarium for their efforts in the study. Because the study involved making visits to the homes of strangers, the researcher notified acquaintances of the times and locations of scheduled research sessions.

Morrison (1996) recruited participants based on a typology of advanced media technologies developed for the study. To qualify as a member of a C/DC home, the participant had to own at least three technologies classified as continuous or dynamically continuous, and likewise, ownership of at least three technologies classified as discontinuous would qualify participants for inclusion in the discontinuous sample. To identify potential participants, Morrison used flyers at apartment complexes, classified advertising, postings on Internet discussion groups, local meetings of Apple or PC users, and personal contact. The final sample included 21 families, 11 of which were classified as discontinuous and 10 as C/DC.

In Pardun's (1992) study of architecture and television behavior, participants had to live in detached single-family houses that could be classified as either transitional or traditional. Potential participant names were gathered from neighbors and co-workers of the researcher and from local PTA members. Twenty families participated in the final study, with 10 living in traditional and 10 living in transitional homes.

For the present study, the researcher called each participant one to three days prior to scheduled visits to confirm the meetings and to get directions to the home. During this call, the researcher asked a series of screening questions to help prepare for the interview and to save time during the actual visit. Screening questions asked the participant to identify other members of the household and who would take part in the research sessions, and what media technologies and subscriptions were present in the household. Appendix B contains the screening questions.

The participant recruitment efforts yielded 21 households in which a stand-alone or subscription-based DVR was present and in which the primary DVR user was 18 or older (see Tables 3.1 and 3.2). This sample size is comparable to samples used in similar qualitative studies (Morrison 1996; Pardun

1992). As in these studies, the present researcher stopped recruiting participants when the findings became redundant and each new participant failed to produce new findings. Thirteen of the households consisted of a male-female couple. Children were present in three of these homes and participated in two households, yielding four participants under 18. In the households where children participated, the child's parent signed a parental permission form, and the researcher obtained consent from child participants in an age-appropriate manner. In all, 39 individual persons took part in the study, including four children (See Table 3.1).

One female participant, Cindy Oliver in Household 10, was unavailable during the interview session with her husband Jeremy, leaving 38 total interview participants. Joseph Smith (Household 4) and his two sons, ages 4 and 6, lived in a home with a stand-alone TiVo DVR in the master bedroom and a home-built digital video recording system in the living room, which consisted of a television set connected to a personal computer. Following the interview in this home, it was determined that an observation involving the stand-alone DVR in the bedroom would not be feasible and that an observation of television viewing on the home-built system would be inconsistent with other observation data on DVRs that had been purchased outside the home. For these reasons, this household was kept in the interview sample, but no observation was completed. Finally, Brian Hall (age 15, in Household 1), participated in the interview along with his father Richard and his brother Brett (age 13), but was not present for the observation. This leaves 35 observation participants.

Data Gathering Instruments

Interview Guide

The interview guide addressed all research questions posed in the literature review (see Appendix C). Participants were asked about DVR use and electronic media consumption, social aspects of media use, perceptions of the DVR and television, how they conceptualized the DVR, and internal and external social utilities for DVRs and television. As noted earlier, the order in which research questions were addressed in the interviews was different from the order in which the questions were originally posed in order to facilitate a natural flow for the conversation between the researcher and participants.

Introductory Questions. The first two interview items were designed to establish a rapport between the researcher and participants and to partially address Research Question 1, which asks what DVR owners think the concept means and if they know the device by another name. The interview began by asking participants what they typically called their DVR when referring to it in conversation. Next, the researcher asked participants to describe their DVR as if they were talking to someone who did not know what it was.

DVR Use and Electronic Media Consumption. The interviews continued with questions about participants' DVR use and electronic media consumption overall. Questions about what types of content participants watched and which DVR functions they used were designed to address Research Question 6 on whether DVR homes are continuous or discontinuous and Research Question 7a on variety of use. Questions about the time participants spend with media were designed to answer research questions 6, 7b, and 7c. Research Question 7b asks about the rate of use for DVRs and 7c addresses the overall amount of media use in DVR homes and where DVR use comes from. Initial questions asked participants about the amount of time they spent with television and DVRs and whether the amount of time spent has changed since the DVR was adopted. Participants were asked about the time they spent with computers, VCRs, DVD players, video games, radio, and print media, as well as non-media activities such as work and hobbies. Participants were asked whether the time they spent with these activities had changed since getting a DVR.

The second set of media behavior questions dealt with selectivity (Research Question 10a) and preparation before media use (Research Question 10b). Selectivity questions related to how participants typically chose what to watch, whether they tended to decide what to watch before or after turning on the set, whether this pattern was different since getting the DVR, and whether this pattern was different for sets not connected to the DVR. To address preparation to view, the researcher asked what, if any, activities participants engaged in before watching television with and without the DVR and whether these activities had changed since getting the DVR.

Social Aspects of Viewing. The third section of the interview guide covered the social aspects of television viewing. These items were meant to address research questions 11 and 12. Research Question 11 dealt with issues of group versus individual viewing, who primarily used television and the DVR, who decided what to watch, and rules for using the DVR and/or television. Research Question 12 covered whether one member of the household was considered to be the DVR expert. This section began by asking participants whether they typically watched television with the DVR alone or with others and how this was different from sets not connected to the DVR. Next, participants were asked to identify who typically chose which programs to watch on sets that were and were not connected to the DVR, and who typically chose material for recording and playback on the DVR. Participants were asked whether the home had any rules for using the DVR, what those rules were, who set those rules, whether the rules applied to everyone, and whether there were any unspoken or implicit rules for DVR use.

Next, the researcher identified who was considered to be the primary user of the DVR and television in the home and who in the home was considered to be the most proficient at using the DVR. The researcher asked whether there was one family member to whom others turned for advice in using the DVR, who this person was, what types of questions were asked of this person, and how often this person was consulted.

Perceptions of DVRs and Media. The next major section of the interview guide covered perceptions of media. Participants were asked about the role of the DVR and television within the home and whether they thought the role of television had changed since getting the DVR (Research Question 9). Questions included what role participants thought television played in their homes and what it would mean not to have it, followed by the same questions about the DVR. Next, the researcher asked whether and how the role of television had changed since the adoption of the DVR, both for the sets connected to DVRs and sets not connected.

Research Question 8 dealt with participants' perceptions of whether the DVR has the characteristics of relative advantage, compatibility, observability, trialability, and complexity. Participants were asked why they purchased the DVR, who initiated the purchase, who made the purchase, their

expectations when they first acquired the DVR, and whether those expectations had been met. To assess whether the DVR had improved the overall television experience, participants were asked their overall opinion of television content and of television as a medium, impressions of content viewed using a DVR, including information and entertainment specifically, and impressions of the DVR itself. The researcher asked whether the DVR was considered easy or difficult to use and what participants would change about the device if they could.

Conceptual Issues. The next set of interview items asked participants what the concepts of digital video recorders, interactivity, and interactive television meant to them, as well as whether they thought the DVR was interactive in any respect. These items were designed to address research questions 1 through 5. Research Question 1a asked what DVR owners thought the phrase "digital video recorder" meant, and 1b asked whether owners knew what a DVR is. Participants were asked whether they were familiar with the phrase "digital video recorder" and what they thought it meant. Items covering research questions 2a and 2b addressed whether DVR owners perceived the device to be similar or dissimilar to other media technologies, and in what sense it was perceived as similar or different.

Research questions 3 and 4 covered the perceived meanings of interactivity and interactive television, respectively. Participants were asked what came to mind when they heard the words "interactivity" and "interactive television" and what they thought those concepts meant. Research Question 5a dealt with whether DVR owners perceived the device to be interactive and 5b asked in what sense they perceived it as interactive. The researcher asked participants whether they thought the DVR was interactive in any respect, and why. Participants were asked to rate the DVR on a scale of one to ten, with one being not at all interactive and ten being fully interactive.

External Social Utility. Research Question 13 addressed whether the DVR served any external social role for its owners. The last set of interview items in the present study were designed to answer this question. Participants were asked if visitors from outside the household ever watched television with participants, whether visitors had ever used the DVR, who these visitors were, and what their experience with the DVR had been like. Finally, the researcher asked participants if they ever discussed their DVR in

conversations outside the home, and if so, when the DVR had been mentioned and what kinds of things the participants had said about the DVR in these discussions.

Observation Coding Sheets

The in-home observations compliment the data uncovered in the interviews. Multiple methods have been used in prior studies to enhance the validity of the findings. Krugman and Johnson (1991) combined focus groups and mail surveys with observations to uncover differences between the viewing process for VCR movie rentals and the process for traditional television viewing. Krugman, Cameron, and McKearney White (1995) also used observations to compare attention to the set during television programs and commercials, and to measure competing and complementary activities that take place while the set is turned on. In-home observations in the present study addressed research questions related to media consumption behavior and the social aspects of television use. Appendix D presents the observation coding items.

Preparation to View. The first section of the coding sheet covered preparation to view (Research Question 10b). The researcher arrived at participants' homes approximately 10 minutes prior to the start of the scheduled observation period. Coding items included getting the viewing room quiet, cleaning, preparing drinks or snacks, mentioning chores performed prior to the researcher's arrival, turning off or lowering lights, taking the telephone off of the hook, making sure everyone was settled down, or putting children to bed.

Start of Viewing. The second section of the coding sheet contained items addressing who was in the room at the beginning of the observation period. The researcher noted the total number of persons in the room and the number of adults and children. This addressed research questions 11a and 11b, which concerned group versus individual viewing and who uses the television connected to the DVR, respectively. The second item in this section coded whether anyone in the room held the remote control, who held the remote, and whether the remote changed hands during the observation. This addressed Research Question 11c dealing with who decides what to watch.

Activities during DVR and Television Use. The third section of the coding sheet addressed activities that took place during the observation period. The researcher coded which programs were watched, media-related activities during the observation, complementary and competing activities, conversations, and attention to the set. The items on programs watched included who selected the program (if the researcher could tell) and whether there was any discussion or disagreement related to the selection. These items addressed Research Question 10a on selectivity and 11c on who decides what to watch in DVR homes.

Media-related activities included any use of the remote control, such as fast-forwarding, rewinding, pausing live or recorded television, and selecting programs from the menu of recorded programs, the on-screen guide, or search features. If the DVR search feature was used, the researcher noted, if possible, whether the search was by actor name, title, keyword, or other criteria, what program was selected, and whether there was any discussion among viewers related to what would be selected. Other items included whether commercials were skipped using the fast-forward feature and which ads were skipped if the researcher was able to tell, use of volume controls and the mute function. These items supplemented interview data on Research Question 7a, which dealt with the variety of use of the DVR and Research Question 11c on who decides what to watch using the DVR.

Research Question 10c asked what competing and complementary activities take place during DVR use. Complementary items coded in the present study included eating, drinking, alcohol, and tobacco use. Competing activities included household chores, reading, writing, interacting with children, performing hobbies, leaving the room, and answering the telephone. The researcher also coded conversations between participants on any subject, conversations about the program, discussions related to rules for using media, and asking for advice on how to use the DVR. Comments or questions directed toward the researcher were not coded, and individual conversations had to be at least one minute apart to be coded as separate conversations.

Eyes-on-Screen Measurement. Attention to the set (Research Question 10d) was assessed by measuring the percent of time a viewer's eyes were directed toward the screen during three five-minute

segments of programming and three commercial breaks. Only the principle participant was coded for this measure. These measures were taken using a digital clock attached to the top of the clipboard and a small stopwatch that fit into the palm of the researcher's hand and could be operated discreetly using only her thumb. During the eyes-on-screen (EOS) measures, the researcher allowed the stopwatch to run whenever the primary participant's eyes were looking at the set, and stopped the timer when he or she looked away from the screen.

For the three program segments, the researcher noted the start and end times for each five-minute measurement period, along with the amount of time within that period that the participant's eyes were directed toward the screen. The researcher noted any competing or complimentary activities that occurred during the measurement periods. Commercial viewing was measured during three separate commercial breaks in programming. The researcher noted start and end times for the segments, the eyes-on-screen time, and zapping and zipping. If the participant changed the channel, fast-forwarded, or left the room during a commercial break, the break was not coded.

Past studies have measured attention to the set using the EOS method during overt (Krugman and Johnson 1991) and covert (Krugman, Cameron, and McKearney White 1995) in-home observations. With overt observations, study participants know that a researcher is present to observe their media consumption. Covert observations involve a researcher visiting the home of a family member, friend, or other acquaintance without telling the participants that a study is taking place until after the observation is complete. Both of these methods in past studies found that viewers look at the screen about 60 percent of the time while watching television programming (Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991). Because overt and covert observation methods have produced similar EOS findings, we can be confident that the EOS measure reported in the present research is a true finding.

Follow-Up. After the observation period concluded, the researcher asked the principal participant in each household a set of follow-up questions as an assessment of validity. If applicable, participants were asked if other household members were using sets in other rooms, and if the participant knew what those individuals were watching. Participants were asked how their typical viewing behavior might have

been different had the researcher not been present. Most participants said their viewing behavior was no different with the researcher present, except that some may have watched television in bed, worn their pajamas, or used the computer at some point.

Data Gathering Procedures

Depth Interviews

For the interview portion of the study, the researcher arrived about 10 minutes prior to the scheduled start time. The researcher made sure that the primary participant and other participating household members were present in order to explain the purpose of the study and to answer any questions that participants had. Participants were encouraged to give their honest experiences and opinions, as there were no right or wrong answers to any of the questions. Next, participants were asked to review and sign two copies of a consent form explaining the nature and purpose of the research, the potential risks involved (none were expected), and other pertinent information. The participants kept one copy of the consent form and the researcher kept the other. In the two households in which children participated, the primary adult participant signed two copies of a parental permission form, and each child participant signed an age-appropriate consent form. Two tape recorders were set up and tested to make sure the recorders could pick up each participant's voice. The researcher took very few notes during the interviews to preserve a comfortable atmosphere for the participants (Morrison 1996; Pardun 1992).

In-Home Observations with Digital Video Recorder Owners

In-home observations, either through the physical presence of a researcher (Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991) or by use of a video camera in participants' homes (Anderson et al. 1986), have been a useful tool for studying audience behavior. This research technique provides a highly detailed account of what people are actually doing with media and other activities that individuals engage in while consuming media. Observational data can be compared with self-reported responses from interviews or surveys. This adds a richer, subtler element to our understanding of audience activity. In the present research, observations were especially helpful in understanding the role of DVR technology in the homes of adopters.

At the conclusion of each interview, the researcher scheduled a one- to two-hour session to visit the participant's home to observe viewing behavior during times when the primary participant normally watched television using the DVR. Any other household members present during the observation were also noted. Participants were carefully told not to do anything out of the ordinary during the researcher's visit, but to behave as they normally would when they watch television using the DVR. As mentioned earlier, one participant, Joseph Smith, did not participate in the observation portion of the study because his stand-alone TiVo DVR was located in the master bedroom of his home, and it was determined that an observation in that part of the house would not be feasible.

Follow-Up with Research Participants

After the two-day research visit, the researcher compiled a brief summary of the data gathered from each household. This summary was e-mailed to study participants, along with a letter thanking them for contributing to the study. The primary participant was invited to contact the researcher with any comments, corrections, or additions. The letter stated that, if the participant did not reply within five days of receiving the e-mail, the researcher would assume that the participant had no comments or suggestions. Two participants responded, and both said the summaries looked accurate. Allowing research participants to review the researcher's interpretation of the data gathered is useful for improving the validity of qualitative data (Morrison 1996; Pardun 1992).

Data Analysis

Grounded Theory Approach

Data gathered through interviews and observations were analyzed according to the grounded theory proposed by Glaser and Strauss (1967). Grounded theory is based on the goal of letting theoretical models and implications emerge from the data, rather than trying to force the data into a pre-existing perspective. This approach to data analysis was especially helpful in the current study on the role of DVRs in the home, as this is a relatively new phenomenon (Glaser and Strauss 1967; Morrison 1996) with little or no prior research (Pardun 1992). In keeping with this suggestion, it was advisable to approach the DVR in this manner. Instead of assuming that DVR behavior can be studied under the same

paradigms that have guided prior studies of television behavior, this study proposes a theoretical model of household media decision-making in a DVR environment based on the data gathered from interviews and observations.

Data analysis using the grounded theory approach involved three steps: open coding, axial coding, and selective coding. Open coding is the identification of initial categories that emerge from the data, and these findings are discussed in the results chapter. Axial coding is the collapsing, or condensing, of the categories identified through open coding into broader, more conceptually abstract categories. In the discussion chapter, the initial findings are collapsed into one broad category for each of the three areas covered in this study: conceptual issues, categorizing the DVR as an innovation, and media consumption.

Finally, selective coding involves the identification of a core category, or the "central phenomenon around which all other categories are integrated and forms the heart of the integration process" (Morrison 1996, p. 267; see also Pardun 1992). The core category identified through selective coding, which is covered in the discussion chapter, led to the development of a theoretical model of media decision making in DVR households that can help in understanding and explaining the impact of this technology on media consumption, anticipating trends in household viewing, and providing a basis for future research.

Data Analysis

To begin identifying categories for the present study, the researcher first examined each interview transcript and observation coding sheet and made an initial listing of categories that emerged (Morrison 1996; Pardun 1992). Next, all transcripts were examined line-by-line and coded until all data specimens had been placed into tables based on their corresponding research questions. Observation data were coded into tables corresponding to the correct research questions, to allow the researcher to compare findings across participants. The copy-and-paste function of Microsoft Word was used to sort data specimens by the research questions they addressed. All data specimens from interviews and observations were copied and pasted into tables to create coding sheets for each research question.

In reviewing the coding sheets, the researcher wrote code notes, or memos. The code notes identified themes, or categories, running through the specimens for each research question. Code notes were first noted in the margins of the coding sheets during the initial line-by-line examination of data. Then, the notes were organized into an outline for further analysis on each research question. The findings of this initial coding procedure are discussed in the results chapter.

Axial Coding

After initial categories were identified and all interview data coded, axial coding was used to condense the findings into broader categories for the identification of more abstract themes (Morrison 1996; Pardun 1992). The researcher reviewed the categories for each of the three broad areas covered in the study—conceptual issues, categorization of innovations, and media consumption—and looked for common themes and links between data specimens in different categories. These three areas were helpful in identifying the axial coding categories (Morrison 1996). The axial categories are explained in the discussion chapter.

Selective coding

Finally, the researcher reviewed the axial categories identified during earlier analysis of interviews and observations to identify the core category that appears to offer the best explanation and understanding of the findings that emerged. This core category, as noted, will serve as the basis for a proposed model of the impact of DVRs on media decision-making in the households of its users, and will also serve as the basis for generating hypotheses to be tested in future studies (Morrison 1996; Pardun 1992).

Table 3.1: Household Characteristics of Study Participants

N	**Primary Participant[a] (Age)**	**Other Participants (Relation to Primary)**	**Non-Participants (Relation to Primary)**
1	Richard Hall (49)	Brian Hall (son, age 15)[b] Brett Hall (son, age 13)	Betty Hall (wife) Robert Hall (son, age 19)
2	Bob Johnson (25)	Beth Johnson (wife)	None
3	Mark Mitchell (23)	None	None
4	Joseph Smith (32)[b]	Jake Smith (son, age 6)[b] Peter Smith (son, age 4)[b]	Mindy Smith (wife)
5	Henry Jackson (29)	Teresa Jackson (wife)	None
6	Dan Wilson (40)	Debbie Wilson (wife)	None
7	William Franklin (27)	Helen Franklin (wife)	None
8	Evan McClure (27)	Paula McClure (wife)	None
9	Tyler Martin (50)	None	Jane Preston (girlfriend)
10	Jeremy Oliver (34)	Cindy Oliver[c]	None
11	David Edwards (33)	Barbara Ellis (girlfriend)	None
12	Stacey Hooper (27)	None	John Hooper (husband) Joey Hooper (son, age 2)
13	Charlotte Ball (31)	None	None
14	Susan Rose (21)	Angela Jones (roommate) Lisa Spencer (roommate)	Melissa Roberts (roommate)
15	Shelley Bolton (22)	Carrie Bowman (roommate)	Samantha Mills (roommate)
16	George Grant (22)	Ellis Lamar (roommate)	None
17	Stephen Bailey (22)	None	Bill Black (roommate) Mike Devine (roommate) Greg Zimmer (roommate)
18	Anthony Williams (37)	Roger Perry (roommate)	None
19	Andrew Phillips (38)	Gina Phillips (wife)	None
20	Alan Davis (38)	Phyllis Davis (wife)	None
21	David Gunter (33)	None	None

a=All names used are pseudonyms.
b=Participated in interview but not observation.
c=participated in observation but not interview.

Table 3.2: Media Characteristics of Participating Households

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
1	Richard Hall	Television sets (4) DVRs (2) Satellite subscription VCRs (2) DVD players (3) Video game console (1) Radios (3) Satellite radio (1) Computers (3) Digital cameras (2) Personal digital assistant (1) Cell phone with camera (1)
2	Bob Johnson	Television sets (2) DVRs (1) Satellite subscription VCR (1) DVD player (1) Video game console (1) Radio (1) Computers (3) Digital camera (1) Personal digital assistant (1)
3	Mark Mitchell	Television sets (2) DVRs (1) Cable subscription VCR (1) DVD player (1) Radios (2) Computers (2)
4	Joseph Smith	Television sets (2) DVRs (2)[a] Cable subscription VCR (1) DVD player (1) Radios (2) Computers (6) Digital camera (1)

Table 3.2: Media Characteristics of Participating Households (Continued)

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
5	Henry Jackson	Television sets (3) DVRs (2) Satellite subscription VCRs (1) DVD players (2) Video game console (1) Radios (4) Satellite radios (1) Computers (3) Digital camera (1) Personal digital assistant (2) Cell phone with camera (2)
6	Dan Wilson	Television sets (2) DVRs (1) Satellite subscription Premium channel subscription Pay-per-view sometimes VCR (1) DVD player (1) Video game consoles (2) Radios (3) Computers (4) Digital camera (1) Personal digital assistant (1) Cell phones with cameras (2)
7	William Franklin	Television set (1) DVR (1) Satellite subscription Premium channel subscription DVD player (1) Video game console (1) Radios (3) Computers (2) Digital camera (1) Cell phone with camera (1)

Table 3.2: Media Characteristics of Participating Households (Continued)

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
8	Evan McClure	Television sets (3) DVR (1) Satellite subscription Pay-per-view movies VCRs (2) DVD players (2) Video game console (1) Radios (5) Computers (5) Digital camera (1) Personal digital assistants (3) Cell phones with cameras (2)
9	Tyler Martin	Television sets (3) DVRs (3) Satellite subscription Premium channels VCRs (2) DVD players (3) Radios (3) Computers (5) Digital camera (1) Personal digital assistant (2)
10	Jeremy Oliver	Television sets (2) DVR (1) Satellite subscription VCR (1) DVD player (1) Video game console (1) Radios (6) Computers (8) Digital camera (1) Personal digital assistant (2)
11	David Edwards	Television sets (3) DVR (1) Cable subscription VCRs (2) DVD player (1) Radios (3) Computers (3) Digital camera (1) Personal digital assistant (1)

Table 3.2: Media Characteristics of Participating Households (Continued)

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
12	Stacey Hooper	Television sets (2) DVR (1) Satellite subscription VCR (1) DVD Player (1) Video game console (1) Radios (3) Computer (1) Digital camera (1)
13	Charlotte Ball	Television sets (2) DVR (1) Satellite subscription Pay-per-view sometimes VCR (1) Radio (1) Computer (1)
14	Susan Rose	Television sets (3) DVR (1) Cable subscription VCRs (3) DVD players (2) Radios (4) Computers (2) Digital camera (1)
15	Shelley Bolton	Television sets (5) DVR (1) Cable subscription Premium channels VCR (1) DVD players (9) Radios (2) Computers (4) Digital camera (1) Personal digital assistant (1) Cell phone with camera (1)

Table 3.2: Media Characteristics of Participating Households (Continued)

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
16	George Grant	Television sets (3) DVR (1) Cable subscription Premium channel VCRs (3) DVD players (3) Video game consoles (4) Radios (2) Computers (2) Digital camera (1)
17	Stephen Bailey	Television sets (7) DVR (1) Cable subscription Premium channel Pay-per-view for football VCR (1) DVD players (4) Video game consoles (5) Radios (4) Computers (4) Digital camera (1)
18	Anthony Williams	Television set (1) DVR (1) Satellite subscription VCR (1) DVD player (1) Video game console (1) Computer (1) Digital camera (1) Personal digital assistant (1) Cell phone with camera (1)
19	Andrew Phillips	Television sets (2) DVR (1) Satellite subscription VCRs (2) DVD player (1) Radios (3) Computers (2) Digital camera (1)

Table 3.2: Media Characteristics of Participating Households (Continued)

N	Primary Participant	Media Technologies in Home (Number, if Applicable)
20	Alan Davis	Television sets (2) DVRs (2) Satellite subscription Premium channels VCR (1) DVD players (2) Video game console (1) Radios (2) Computers (2) Digital camera (1) Personal digital assistant (1)
21	David Gunter	Television sets (2) DVRs (2) Satellite subscription VCR (1) DVD players (5) Video game consoles (9) Radios (8) Satellite radio (1) Computers (10) Digital camera (1) Personal digital assistant (1) Cell phone with camera (1)

a=One DVR is a stand-alone TiVo. The second is a home-built model.

CHAPTER 4

RESULTS

Conceptual Issues

Research Question 1a asked what DVR owners think the concept "digital video recorder" means. Research Question 1b asked whether DVR owners know what a DVR is, and Research Question 1c asked whether owners know the DVR by another name. During the interview phase of the study, participants grounded their definitions of the phrase "digital video recorder" in prior experience with new media, particularly the VCR and computer. In stating what they thought the phrase "digital video recorder" meant, they anchored their conceptions in past experience with other video products. All participant names used in this research are pseudonyms.

Anchor in past experience: VCR on Steroids

The VCR served as a launching pad for describing the DVR and was the most common technology compared to the DVR (see Table 4.1). The phrase "like a VCR" was common throughout the responses.

> Alan Davis: A VCR on steroids…because…it's just smarter than a VCR…
>
> Beth Johnson: In my mind…it's a VHS recorder on a hard drive.
>
> Paula McClure: …to me, I think of it as a digital VCR…
>
> David Gunter: Digital VCR.

However, participants clearly do not believe that the DVR is the same as a VCR. Rather, they see the DVR as an enhancement over a prior media technology with similar, but more primitive, functions.

> Debbie Wilson: It just means more highly technologically advanced VCR.
>
> Gina Phillips: It's a VCR that actually operates (laughs).
>
> David Edwards: I've been telling people that it's like a VCR except that it's smart enough to record programs proactively…

Phyllis Davis: Like a VCR, only much, much better.

Two specific differences were noted between the DVR and the VCR. One was the perception that the DVR is much easier to use than a VCR. Another was the DVR's ability to manipulate real time television through pause and rewind features.

> Shelley Bolton: …it's just like a VCR without the tape, and it's so much easier to record stuff, because you just go to the menu, find your show and press record…it's just so much easier than going through and setting the time.
>
> Jeremy Oliver: I would probably describe it as something like a supped up VCR…I would describe some of the functions, you can pause live TV, you can rewind…all the different things that you can do with it…

"More like a computer." A third key difference noted between the DVR and VCR was that the DVR uses a computer hard drive to store programming in digital format. The computer thus became a secondary anchor for participants in conceptualizing the DVR.

> Jake Smith (age 6): I would say more like a computer…
>
> Ellis Lamar: I would say it's a computer that records…live television…
>
> Stephen Bailey: …kind of like a computer for your TV…

In defining the DVR as being similar to a computer, participants referred to digital recording and storage of television content, the use of a hard drive to store programs, and the use of binomial code to perform various operations.

> Tyler Martin: …a piece of equipment that can record digitally to a hard disk…
>
> Henry Jackson: It's that you are recording your information digitally instead of analog.
>
> Richard Hall: …like a VCR only you're recording onto a hard drive.
>
> Joseph Smith: …instead of a typical analog video recorder such as the VHS, that it [the DVR] records the information as a series of…ones and zeroes…

Some participants described the DVR as an interactive tool, while others highlighted DVR functions such as time shifting and content manipulation in their definitions. Other technologies compared to the DVR included camcorders, digital cameras, and DVD players.

The "TiVo" lexicon. Research Question 1c asked whether DVR owners know the device by another name, such as a familiar brand name. Participants were asked during the interview portion of the study what they called their DVR when referring to it in conversation. All but two said they refer to the DVR by the brand name "TiVo," including participants who owned another brand of DVR, such as the Dish Network PVR. Most were familiar with the phrase "digital video recorder," but prefer to use the TiVo name in a generic sense; a few were not familiar with the generic phrase.

> Charlotte Ball: No, I wasn't at all [aware of the generic term]. Just TiVo, and so I didn't know that there's a difference.
>
> Shelley Bolton: I had no idea what you were talking about (laughs)…I have just called it TiVo.
>
> Gina Phillips: It's the same for me. I mean if you said TiVo, I instantly know what it is. I don't translate that they're the same thing. I mean, I do now, but…

Some compared TiVo to the Kleenex brand of facial tissues.

> Tyler Martin: Digital video recorder? Well, just as Kleenex are…tissues…TiVo has become the generic term for digital video recorders…
>
> Susan Rose: …well, I heard TiVo before I heard DVR, but…when I heard it I was like, oh, that's what it is…like Kleenex, it's like…facial tissue…I don't know, TiVo I guess is the brand (laughs). I would never say DVR.

Further, the TiVo brand name is commonly used as both a noun and a verb. As a noun, it is used as a generic reference to the DVR. As a verb, it refers to either recording a program (i.e., "We TiVo *Survivor* every Thursday") or instantly replaying a portion of a program being viewed (i.e., "We will TiVo something if we don't understand a line of dialogue").

<u>Comparing the DVR to Other Media</u>

Research questions 2a and 2b ask whether DVR owners perceive the DVR to be similar or dissimilar to other forms of media technologies and in what sense they perceive it to be similar or different. They were asked to compare the DVR to VCRs, DVD players, video games, and computers. Participants responded to interview questions about how the DVR compares to traditional media forms such as television without a DVR, radio, and print. Based on these responses, DVR owners perceive the

DVR to be more advanced than VCRs, traditional television, radio, and print media, somewhat similar to DVD players, and less advanced than computers or video games (see Figure 4.1).

More Advanced than the VCR, Similar to a DVD Player. In comparing the DVR to VCRs and DVD players, interview questions covered these specific technologies, as well as the experience of watching rented or previously purchased programming. There was a general sense that the DVR is more similar to a DVD player, which also uses digital technology, than it is to a VCR. There was a decidedly negative, almost condescending, view of the VCR among DVR owners in this study, especially with respect to complexity of use. Although the VCR has been adopted by over 90 percent of television households in the United States (Consumer Electronics Association 2003), DVR owners have clearly confined the VCR to obsolescence.

> Richard Hall: …setting a VCR tape is…a source for comedy skits
>
> Beth Johnson: …the VCR is pitiful.
>
> Joseph Smith: …programming a VCR was funny; they still make jokes about that.

Participants consistently described the DVR as easier to use than a VCR but similar, again, to the DVD player.

> Henry Jackson: It's easier than a VCR and about the same as a DVD player.
>
> William Franklin: …[compared to a VCR], it's…world's better. A DVD player…as far as just ease of use, it's…pretty much the same…

One difference between the DVR and DVD player was the view that the DVD was a tool for watching movies and fixed content, while the DVR was used to consume more timely material such as a current episode of a television show, and then delete it when finished.

Along the lines of comparing the DVR to a DVD player or VCR, respondents were asked to compare the experiences of renting or buying programming from a video store to using a DVR. The prominent theme among these answers was the sense that watching rented or purchased programming was an occasional activity while the DVR was used more frequently for watching regular television. Anthony Williams described watching rented content as an "entertainment event," while watching material

recorded on the DVR was "an ongoing entertainment experience." For o thers, the DVR was perceived as a substitute for renting movies from a video store. These respondents felt that there was greater value in paying a monthly subscription fee to a DVR service and recording unlimited movies than in paying a for each movie rental separately.

> William Franklin: …we pay about 12 dollars a month for TiVo, and I can watch something anytime I feel like it, but I pay 6 bucks to go rent a movie, and I've got it for four days, and…in that four days I can watch it as much as I want, but after that…I'm done. I can keep *Bad Boys II* on our DVR for as long as I feel like it. So, you know…once again, it goes back to you know, my time schedule…I don't have to worry about going back and taking things back…

Other participants expressed the view that the DVD had better sound and picture quality than watching regular television with a DVR, and others said that they rarely rent or watch previously purchased programming.

Video Games More Interactive than a DVR. In comparing a DVR to video games, participants felt that video games were more interactive and engaging than watching programs on the DVR or with regular television.

> Anthony Williams: TiVo [is] still really…the passive experience of watching television…whereas a video game is much more of…an interactive experience.

> Lisa Spencer: I think playing video games are more fun…just watching TV is, you're not as into it as when you play a video game.

More specifically, respondents felt that they became more immersed in video games and were more likely to lose track of time while playing them.

> David Edwards: I [play video games] you know, to kill time in the afternoon…

> Jeremy Oliver: I find it easier to lose track of time playing a video game than whenever we're watching TV…because even if you are zap ping through ads…you kind of know when you've hit the end…In the video game there's not necessarily that sense of…time…

> William Franklin: The video game is basically to give me something to do that I don't really need to think about for just kind of mindless entertainment.

Finally, some did not find video games and DVR use to be comparable at all.

> Brian Hall (age 15): I wouldn't know how to compare them. They're too different.

> Susan Rose: I don't really compare them…it's two different…forms of entertainm ent…

Breadth versus Complexity—DVR versus Computers. Based on participant answers, the DVR is similar to computers in terms of using a hard drive to store content and a menu-driven interface to select programs for recording. The DVR performs a more dedicated role than a computer or the Internet but is also considered to be less complex and easier to use. Some participants focused on the technical similarities between DVR and computer technology.

> William Franklin: I guess, it's basically just a specialized computer…it does exactly what we want it to do…

> Tyler Martin: …they're similar to me in that I've been on the inside, put hard disks in, and …done networking, so for me it's very similar.

Others characterized searching for programs on a DVR's menu system as similar to using a search engine to find a broader array of topics on the Internet.

> Stephen Bailey: You know what you're going to get when you go to a Web site…same as when you select through the [DVR] menu, you know what you're going to watch…

> Anthony Williams: …I think it really has to do with just the amount of content…TiVo's really just a smaller subset of…information…

However, computers and the Internet are seen as offering a greater range of choices and interactivity to the user than the DVR, but are also considered to be more complex and prone to technical glitches. Common descriptors for the computer included a tool for information (Richard Hall), instant gratification (Beth Johnson), interactivity (Teresa Jackson), variety of uses (Stacey Hooper), and the ability to search for specific topics (Bob Johnson). On the negative side, computers were perceived as a source of complexity and frustration (Joseph Smith and David Edwards). Finally, some participants did not feel that the computer and the DVR were comparable at all.

Changing perceptions of TV. A strong affective sentiment ran through comparisons between using a DVR and using television without one. Most participants expressed a strong desire never to go back to a non-DVR environment. Many gave examples of times they have felt discomfort when exposed to television in non-DVR environments since owning a DVR.

> Paula McClure: I noticed like, this morning at the car dealership [waiting and watching TV], I just wanted to not see the commercials. (laughs) …that's something I just get used to…I really like all the features that it has…sometimes there are shows like the *Today Show* or something that

I don't record that I did enjoy watching, but you know, I still want certain features of TiVo back, even though I'm watching a television show.

Bob Johnson: when I'm watching TV…over at my mom and dad's house for something and I get a phone call, or have to go somewhere I know I can't pause the show and come back to it later, so I'll finish the show or wait for a commercial, or you know what's that all about, so…you get really spoiled

Carrie Bowman: Yeah, it's a pain to not have a TiVo now that I've had one…because I am just frustrated. I wish I had the functions that I had and I don't…I just want to pause it and go run and do something and then I can't. And I mean this is no fair if I could once.

Gina Phillips: I'm thinking about my parents' cable…we would miss something and like, oh, go back, and I'm like, we can't go back…So if you didn't see it the first time or you have to go to the bathroom, forget it, dude.

Along with missing the DVR when it is not present in a television environment, respondents expressed a greater sense of enjoyment and fun while using television with the DVR. Some noted the ability to skip commercials as a key reason for this enhanced enjoyment.

Henry Jackson: It's just the freedom from commercials.

Barbara Ellis: We get to get rid of the commercials.

Many felt that television with a DVR was more time-efficient than without one. More specifically, participants feel they have more control of their time when they watch television using the DVR.

Dan Wilson: Without a DVR, you're kind of at the mercy of the clock

Debbie Wilson: You're at the mercy of the clock. You can't take a bathroom break when you want to take a bathroom break. You have to go at the commercials.

Mark Mitchell: TiVo makes it [watching television] much more time efficient.

Teresa Jackson: …more time consuming [without a DVR]

On the downside, Brian Hall (age 15) thought the DVR presented an opportunity for technical problems with the television set and Mark Mitchell felt that viewers are required to do more work to enjoy television with a DVR. Stacey Hooper did not notice much difference between television with and without a DVR because she was relatively uninvolved with television programming overall.

Radio Similar to Traditional Television. In comparing radio to using a DVR, it is important to note that there is a key difference between where people typically watch television (at home) and where

they listen to the radio (in the car or while working), and that television provides audio and visual content while radio only has the audio dimension. Along those lines, some study participants felt that the DVR and radio were too different to draw any meaningful comparisons.

> Mark Mitchell: I think apples to oranges. I wouldn't even compare it.
>
> Alan Davis: I don't really consider them as similar.

Two prominent themes emerged among other respondents. The first was that DVR users perceived radio to be similar to traditional television, especially in terms of not having control over content and a greater propensity to "channel surf" than when using a DVR.

> Dan Wilson: Radio is…kind of the same as, I guess, regular TV, y ou know. You, you have to turn it on and listen to it and wait for what you want to hear.
>
> Debbie Wilson: There's still a great deal of surfing depending on who you're in the car with or, or whatever…with regular television.
>
> Evan McClure: Radio and playing the TV without TiVo are similar, I mean, because there's commercials, and there's you know, all the stuff that I want to hear and there's stuff that I don't, but there's fewer channels and there's less on than I want to hear.

A second main theme when comparing using a DVR to radio was the desire for DVR functions when listening to the radio, such as the ability to rewind and pause. In other words, owning a DVR expands the audience member's expectations when using other media vehicles.

> Henry Jackson: They haven' t put a rewind button on my radio yet.
>
> Tyler Martin: …that would be in my wish list also. It would be nice to…be able to pull in radio, and record radio programs that you want so you can listen to them when you wish.
>
> Gina Phillips: …you're going t hrough the drive-through or something and next thing you know they just said, and that's the weather, and you're like, oh crap, I missed the weather. You know whereas if it's on the TiVo you can just go right back and see it or on the TV you have that capability.

Some participants expressed a view of radio being a more passive medium used for background noise and "multitasking," while television in general was seen as demanding more involvement and attention.

How Do DVR Owners Understand Interactivity?

The third research question asked what DVR owners think interactivity means. Three themes that ran through participants' responses were communication, control, and viewer participation.

Interactivity as communication. Those who described interactivity as a communication-related term tended to use person-to-person (P2P) or person-to-machine (P2M) references. Some thought of P2P interactivity as something that facilitates interpersonal communication with another person or with the television service provider or content producer.

> Bob Johnson: You can interact with people just talking to them.
>
> David Edwards: Interactivity means that we're connecting past the cable head-end to…some sort of content provider.

Others recognized interactivity as also enabling P2M communication. Examples included playing video games, selecting options from an on-screen menu, pulling up information with a remote control or keyboard, and having "something react back to you when you…dosomething it does something back" (Bob Johnson).

Control. A second conceptualization of interactivity involved a greater sense of user control over a mediated environment. Many participants actually used the word "control" repeatedly in defining interactivity, while others referred to a range of choices available to the viewer in terms of the content and timing of programming. Others used the theme of viewer manipulation of television.

> Helen Franklin: [Interactivity means] an offering, and…you're able to manipulate it….it's your programming…we build our own TGIF.
>
> Tyler Martin: [Interactivity involves] a content delivery system that can be modified, altered, and change [d]…by the user…

Interactivity as participation. A third major theme running through participants' conceptions of interactivity was participation. This theme went beyond merely communicating with another person or even with a machine, but involved a perception that the viewer was actively performing some behavior while engaged in a particular media environment:

> David Gunter: Interactive means that…instead of sitting passively, you actually make actions.
>
> Carrie Bowman: …it lets you play along or work with your television…
>
> Stacey Hooper: …someone being involved in a particular activity…

Finally, David Gunter also commented that he thought interactivity was a term overused in marketing efforts to sell new media technologies.

How Do DVR Owners Understand Interactive Television?

To address the fourth research question, respondents were asked what they think interactive television means. Responses were similar to participant views on interactivity, with the major themes of communication, participation, and control running through the answers. Mark Mitchell's description of interactive television as "two-way communication with your television set…[and] being able to control television viewing" reflects these themes. Another theme included the notion of shopping through the television set. Still other participants held the view that interactive television was something still under development and not yet fully functional, and a perception that television is incompatible with interactivity.

> Joseph Smith: Shopping channel…there's the digital cable stuff but I have not seen to plunk down any money for that…
>
> Tyler Martin: Interactive television is something that's not there yet…it's probably in its nascent state on the Internet…they've promised for a long time but we haven't seen it's fruition.
>
> Anthony Williams: …it's never really worked out very well…I think there's other media [besides television] that are better suited to…that sort of thing.

Communicating through television. Interactive television as a form of communication involved communication with the television set, the ability to send and receive information through the set, and having Internet capability on the television set. The view of interactive television as communication with the television set itself suggests elements or artificial intelligence, which involves the addition of human-like decision-making abilities to computers and other electronic devices (Berkeley 1997; Copeland 2000; Mitchell 2000). Henry Jackson's response exemplifies this view of interactive television as a form of person-to-machine (P2M) communication:

> …the TV asks you something and you tell it something or you tell the TV something and it asks you something in return, that…exchange between you and the TV. It's not just you telling. Like the VCR, you tell the VCR to record and it records. You tell the TiVo to record something and it asks you are you sure you want to record it, you know, so that exchange…

Others described interactive television as something that would allow the viewer to send or receive correspondence or information through the television set, a function perceived as similar to the Internet.

> Susan Rose: …I remember seeing like, satellites where…you can press…an info button and you can get…information from…E!, or something comes…off the Internet or something…

> David Edwards: …Or third party commentary. You know, it would've been great if fact-check.org had…kind of like pop-up video on the Republican National Convention and…somebody could say…that number's an exaggeration or something like that…

Participating in the Show. A second theme in respondents' definitions of interactive television was that of viewer participation in the television program, an enhancement mentioned in prior definitions of interactive television (BBC 2004; Wisconsin Public Television 2000). Examples of such participation included voting by phone or computer, submitting feedback during political programming, playing along with a game show, or influencing fictional content.

> Evan McClure: Well, kind of like *American Idol*…you choose what happens, with the poll, or whatever.

> Richard Hall: Public opinion polls, real time feedback on opinions and points that politicians make in debates.

> Brett Hall (age 13): Television that you can…participate in…like game shows.

> Debbie Wilson: …it's kind of like those books where you…get to the end of a section and it says if you want this to happen you go to page 47, but if you…want this to happen, you go to page 132.

Control. Another common theme among participants was the notion of interactive television as a mechanism of enhanced viewer control over television, such as the expansion of the number of options for using television and the availability of on-screen menus for selecting among those options. Many honed in on the notion of an expanded list of choices.

> Helen Franklin: Well, interactive television, that's just…your choice of …what's pla ying on the television medium at that time.

> William Franklin: …however long it was when cable came out…you had your four choices…then…as channels expanded, you had 50 channels…and now I have an endless number of choices for what I want to watch.

> Alan Davis: …something where you have choices to make

Is the DVR interactive?

Research questions 5a and 5b ask whether DVR owners perceive the DVR as interactive, and if so, in what sense they perceive it as interactive. Participants were split on this question. Most considered the DVR to be interactive (DVR-I respondents), but many did not (DVR-N respondents), and there was not a lot of middle ground between the two positions. This discussion examines the reasons given for these opinions.

In addition, the researcher reviewed participants' definitions for "digital video recorder" and "interactivity" to see if the perceived interactivity of the DVR is grounded in a person's definition of these concepts. No clear pattern emerged with respect to definitions of the digital video recorder. Both groups of participants, DVR-I and DVR-N, tend to ground their conceptualization of the DVR in prior experience with the VCR. However, there were different patterns in how DVR-I and DVR-N respondents defined the concept of interactivity. The following paragraphs detail (1) why respondents answered yes or no to the question of whether they think the DVR is an interactive technology and (2) the different perceived meanings of interactivity among DVR-I and DVR-N respondents.

Selection Does not Equal Interaction (DVR-N). DVR-N respondents tend not to think of the DVR selection features as an instance of interactivity (Table 4.2). They do not think the DVR is an interactive tool because they do not perceive it as providing full, two-way communication capability. Some acknowledge that DVR service providers collect viewership data through the remote control. This capability was seen as making the DVR interactive from the service provider's perspective, but not to the consumer.

> Richard Hall: [We know that] every time we go back and watch a scene over again, that DirecTV or TiVo or somebody knows that that information can be watched…
>
> Joseph Smith: It is my understanding that TiVo actually records the viewing habits of its subscribers. So I guess in that respect it's also interactive…
>
> Jeremy Oliver: I do acknowledge that there is some communication going on, but…I don't really see two-way…

Some DVR-N participants considered the DVR's ability to suggest programs based on a viewer's prior recording habits to be interactive. However, because they had elected not to use this feature, they did not consider the DVR to be interactive.

> Joseph Smith: I guess technically it is because it has the TiVo suggestion box, which would definitely be considered a sub-type of interactivity.
>
> Phyllis Davis: Yeah, when it was doing more, when we first got it, finding programs to suggest to us…But since we don't use that functionality anymore…I just don't see it that way.
>
> Alan Davis: If I had…TiVo suggestions turn ed on, I would consider it a bit more interactive…

Third, other DVR-N respondents saw structural factors inhibiting the DVR's potential for interactivity. These included the technological limitations of cable or satellite services and a view that the DVR is capable of two-way communication but that manufacturers or service providers had yet to realize this potential.

> Beth Johnson: I think the cable system itself limits its interactivity…
>
> David Edwards: …they have the capacity to do two -way stuff, except that …they just haven't, uh, that I've seen, done anything, beyond that very low level.

Finally, DVR-N respondents' perceived definitions of interactivity were reexamined in light of their view that the DVR is not interactive. These participants viewed interactivity as enabling two-way, P2P communication.

> Richard Hall: The ability to feed information back into the medium.
>
> Jeremy Oliver: Interactivity is two-way communication…It's more of a conversation…

These participants see interactivity as the capability for the viewer at home to participate in a program directly through the television set by playing along with a game show, voting in an opinion poll, or submitting an opinion to a talk show. They do not consider the DVR's recording and program manipulation features to be instances of interactivity because this does not constitute participation in their view.

> Stacey Hooper: I don't really [think the DVR is interactive]…it's a place to house everything, but it doesn't really give you the ability to…involve yourself with that particular scene in any way.

> Charlotte Ball: No. I mean it's not interacting with me. I might be interacting with it, but I think that it would have to be both sides to be interactive.

Control equals Interactivity (DVR-I). DVR-I participants, however, do view the DVR features as a form of P2M interactivity (Table 4.3). These respondents frequently spoke of "telling" the DVR to do something for them.

> Angela Jones: …we're putting in what we want to watch, telling it you know, doing stuf f for us… And since I'm working with the television to get what I want.

> George Grant: …as far as your telling it, uh, based upon your ratings and…what you're recording, you're telling it what you want to see, and …the…TiVo menu, it tallies, it has it list ed you know, this is what you like.

In explaining why they consider the DVR to be interactive, DVR-I respondents also frequently referred to the notions of control and choice:

> Tyler Martin: …with respect to the TiVo, of course you have much more interacti vity as opposed to television; television used to be a medium where you had no control. Now you have total control.

> Debbie Wilson: Yeah, I think it is in the sense that I have a choice to…watch or have it do whatever I want it to do, whether I want it to go to live TV, whether I want it to record, save something…whether I want it to delete something.

DVR-I participants did see limits on the DVR's interactivity. Some perceived that the DVR is only interactive if the viewer makes the effort to initiate the exchange. Others believed that structural factors, such as the number of channels available on a cable or satellite system, limit interactive capabilities. Other participants distinguished between interacting with a machine and conversing with another person. Finally, some saw the lack of functions such as sharing television shows by e-mail as limiting the DVR's interactive potential.

DVR-I respondents have a more expansive view of what interactivity means than DVR-N participants. DVR owners who consider the device to be interactive viewed interactivity as the capability for enhanced control and choice in a mediated environment.

> Mark Mitchell: …controlling viewing content…

> Henry Jackson: You work with it. You tell it one thing and it tells you something else.

> Stephen Bailey: …you're prompted with a list of choices…and it has graphics and information for each different choice…

DVR-I respondents, like their DVR-N counterparts, recognized a P2P component of interactivity, such as involvement with the media through game playing and sharing opinions. However, these participants were more apt to include examples of P2M in addition to P2P communication in their definitions. In other words, interactivity includes communicating with the DVR or the television set, not just with a person.

> Mark Mitchell: Kind of like…a relationship with your TiVo.
>
> Debbie Wilson: That it's going to learn from what I give it.
>
> Tyler Martin: …instead of being one -way…you have a content delivery system that can be modified, altered, and changed…by the user.
>
> George Grant: …I say something…it responds…based upon my views.

Categorizing Households Based on Technology Ownership

Research Question 6 asks whether DVR homes can be classified as continuous-dynamically continuous (C-DC) or discontinuous. Robertson (1971), Krugman (1985), and Morrison (1996) state that discontinuous innovations establish new consumption patterns, while C-DC innovations do not. To assess whether DVR owners have established new media consumption patterns, the interview guide included questions about whether and how participants felt that their viewing choices and time spent with media had changed since getting a DVR. Responses indicate that DVR users have established new patterns in terms of viewing choices and the nature of the time they spend with media and other activities. These changes do vary across participants, however, indicating that different segments of the DVR population exist with respect to the specific changes that occur.

Changes in Viewing Choices

Purposeful versus random viewing. Adoption of a DVR produced three noticeable changes in viewing patterns. The first change is that participants felt that their viewing was more purposeful and less random than before they had a DVR. Viewers are less likely to channel surf and more likely to watch shows they find interesting rather than settle for whatever happens to be on when they are able to watch.

> Brian Hall (age 15): I used to…watch whatever was on TV, but now…I will record a bunch of different things and then…just watch whatever I recorded, and I don't have to watch [anything] if I don't want to.
>
> Joseph Smith: We no longer channel surf…we will go and see what has recorded that we want to watch, and…watch from that list.
>
> Paula McClure: I used to just watch brain-dead shows like the Game Show Network…[now I] get to see a whole lot more of what I want to see than…I'm just watching it because it's on.
>
> David Gunter: I was more inclined to put the television as a background sort of thing, and I'll still do that with a certain type of show, a news network I'll put on as background, but…if I care enough about the show to have it recorded, I'm going to make time to sit down and actually watch versus just having it on.

These DVR users have moved beyond the mere act of watching television to taking greater ownership of programming decisions in their homes.

A second example of more purposeful viewing is that some DVRs contain a dual tuner that allows the viewer to watch two programs at the same time. The user can pause one channel and switch to a second program, typically when a commercial break begins, with the first channel still on pause. When the viewer returns to the first channel, he or she can fast forward through the commercial break and resume watching the program.

> Andrew Phillips: What I'll do is I use the feature when I can pause one channel, flip over to the other channel and watch it, when a commercial comes on and I'll flip back, and so I'm kind of watching two broadcasts at the same time.
>
> Henry Jackson: Now, you can watch two shows from 8 to 8:30, so the shows we've been like, "Eh, I don't know if I want to watch it or not…" Now we can watch both of them.

A third form of more purposeful viewing involved using the fast-forward button to alter a program that had been recorded earlier, by skipping less desirable segments, which allows the viewer to assume the role of program editor.

> Richard Hall: …one of the advantages being with a baseball game, we can…get the essence of the baseball game…in 20 minutes, so instead of…committing three hours to a baseball game, we commit an hour to it, so yes, we watch more games.
>
> David Edwards: For instance…it went out and grabbed *Sports Center* on Saturday morning, Barry Bonds had just hit his seven-hundredth home run, I came in, watched just the five minutes of coverage of Barry Bonds…and then turned it off, whereas I would have had to watch a whole hour of *Sports Center* [without the DVR]…And I did that with the *Daily Show* this week, too.

Viewer as Scheduling Aficionado. The second change in viewing choices involved time shifting, giving viewers the ability to watch desired programming that comes on at inconvenient times. Time shifting expands the programming options available, transforming the viewer into a television scheduling aficionado, similar to the way DVD movie "extras" such as unseen footage and behind -the-scenes information help create interest in movies. Before getting a DVR, viewers felt that they had to "settle" for whatever programs came on at the times th at were convenient for them to watch. Now, they have access to programming, such as daytime and late night content, that they had missed because of work or sleep schedules. The viewer in this context becomes the final decision maker with respect to the television schedule—selecting the precise content of interest and watching it at the time that is most convenient.

For example, Brian Hall (age 15) and Evan McClure had begun watching the late night *Adult Swim* programming on Cartoon Network, which they had not watched previously because they were not willing to stay up for the actual airtime. George Grant said that he had "kind of morphed from the prime time sitcom…to more of…the occasional documentary…that I really didn't know what their schedule was until I got TiVo." Thus, time shifting introduces a third change in viewing habits in that the DVR user can change the types of media content consumed.

Different content choices. Participants commented on changes in the actual content they choose to watch since getting a DVR. Generally, participants noticed more changes in entertainment programming, although some change was reported for news viewing. Many viewers reported an expansion in the different types of genres they would watch. This expansion was often tied to the ability to time shift.

> Richard Hall: I think we watch different things. I think we watch more movies because they're on when you want to watch them…
>
> Teresa Jackson: I think we've watched some different things that we wouldn't have normally…watched , just because we can record it and watch it later…I keep referring to TLC, but I watch a lot more…TLC…programs…that come on during the day than I used to.
>
> Andrew Phillips: I used to mainly just watch the news, and now I'm watching…car shows.

Some did experience similar changes in their news viewing. Joseph Smith reported that he now watches the *700 Club* instead of more traditional network news programs because it is now available to him when he is able to watch it. Evan McClure sometimes sets the DVR to record the six o'clock news so that he can watch it if he is late getting home in the evening. He also sometimes records opinion-based programs such as *Hannity and Colmes* in order to avoid conflicts with his wife, who does not watch them.

While some participants thought the content of their viewing had expanded since getting the DVR, others thought their preferences had narrowed. Some participants had stopped watching certain genres, such as cartoons or prime time programs, because they became bored after watching the large amount of content they found through the DVR.

> Beth Johnson: …Because when I saw on the TiVo how much time I was logging in on watching the soaps…and I could watch a one hour soap in ten minutes, so I was fast forwarding through all the boring parts, so in that manner, I decided…if I don't…really want to watch it then I don't need to be watching it anyway.

Finally, some viewers did not think that the content of their television viewing choices had changed since adopting a DVR.

Changes in Time Spent with Television

Better Use of Time with Television. The common theme with respect to the DVR's effect on time with television was a sense of making better use of that time. Participants were divided on whether they spend more, less, or the same amount of literal time with television since getting a DVR. The DVR allows the viewer to skip advertising and undesirable program content, which means that a larger amount of content can fit into a shorter period of time than before. Because of this, many thought they spent either less or the same amount of time with television, but that they were watching more programs and a higher quality of content than without a DVR.

> Richard Hall: *David Letterman* is a half hour of commercials, and it's on too late…so, I will watch last night's *David Letterman* at about 10 at night the next day…speed through the commercials…so that's a fundamental change. I watch yesterday's *David Letterman* tonight and spend half the time doing it…I think the TV is on less, but we end up watching more.
>
> Henry Jackson: We watch four hours of TV in three hours now…
>
> Helen Franklin: I watch about the same amount, but I see more, if that makes any sense.

> Mark Mitchell: I watch a lot more programming now, because I'm really able to narrow it down to what I want…But, how many hours hasn't increased.
>
> Stacey Hooper: I don't know if I watch more or less, probably about the same, it's just different how I watch it.

Other participants felt that they spend more time with television since getting a DVR, because more desirable options are available through the DVR's menu of recorded programming. This greater abundance of interesting content that can be watched at a time convenient to the viewer leads to a perception of more time spent with television overall.

> Beth Johnson: I think we watch maybe more TV now that we have a TiVo because [it's] just more convenient to fit into our schedule.
>
> Debbie Wilson: I think I spend more time with the TV now, because I know that there are more things…I can get thro ugh the program faster and be able to watch more things…
>
> Tyler Martin: So now, I watch more, but it's more quality things [and] it's only what I want to watch.
>
> Angela Jones: I guess it's more convenient, so I guess, yeah, a little bit more.

Time with Other Media and Activities

Substitute for Other Media Technologies. Most participants did not think their use of the Internet, VCRs, newspapers, magazines, or radio had changed since getting a DVR. Two technologies that many participants did spend less time with were DVD movie rentals and video games. Because these viewers have more desirable programming stored on the DVR, they spend their time with these programs as opposed to seeking alternatives from a video store.

> Richard Hall: We go to Blockbuster less because of TiVo.
>
> Joseph Smith: …we usually have something else that we've recorded that we'll watch instead of going out and spending money and renting a movie.
>
> David Edwards: I think we're less likely to rent a…movie now.
>
> Angela Jones: …we don't feel th e need to rent movies as much…
>
> Susan Rose: I don't think it's totally replaced it, but…I don't feel the need to rent stuff as much anymore.

Some participants engage in video game activity when no desirable television programming can be found at the moment. Now that they have access to more appealing content through the DVR, these viewers play games less often.

> William Franklin: The amount of time I play video games has [declined], because…I can watch a lot more things that I really prefer to watch.
>
> George Grant: It's really cut down on my video games, because [I] come in here [and] it's a lot easier to watch.
>
> Stephen Bailey: I used to play video games more. I usually do that when there's nothing on TV, and when I have time to spare…that's not really a fac tor anymore.

Greater Flexibility in Non-Media Time. Time with non-media activities such as hobbies or chores remained unchanged for many participants, although some felt they spend more time with these activities because they can now "put off" watching t elevision and the DVR will hold the programs until they are ready to begin viewing.

> David Gunter: I'm more inclined, if I'm in the mood, to work on a hobby…I'm never going to say, "I didn't plan on being home to watch *Seinfeld*, but it's on and I'm going to watch it"…I'll just record it and go and do the other thing.
>
> Bob Johnson: We do a lot more stuff in the evenings, and not worry about…getting home for the show, or we've got to be back by 8 o'clock or something…We [can] go on a long walk here in the neighborhood and not worry about being back at a certain time…

However, Stacey Hooper spends less time scrap booking than before she got a DVR.

Categorizing Households Based on Use of Technology

In their National Science Foundation study, Shih and Venkatesh (2004) developed the use-diffusion model for studying the implementation of home video and entertainment innovations. The dimensions of variety and rate of use yielded four different use-diffusion orientations, which were illustrated in Table 2.3 in the literature review chapter: intense (high variety and high rate of use), specialized (low variety, high rate), non-specialized (high variety, low rate), and limited (low variety and rate). Variety of use was defined as the different ways that a consumer electronics innovation is used, and rate of use was defined as the amount of time spent with the innovation. In the present study, variety and

rate of use were analyzed for DVR owners to determine the use-diffusion pattern that best characterizes DVR use in the home.

Variety of Use

Shih and Venkatesh (2004) operationalized variety of use as the listing of different uses for a home computer, but they did not specify exactly what levels of use would signify high or low variety. This research operationalizes variety of use in four ways (see Table 4.4): programming choices, program guide selections, and search parameters mentioned in the interview portion of the study, and remote control functions used during the observations. In order to determine whether variety of use was high or low, the average number of each of these activities was determined for all participants. If an individual had above average use for three of the four parameters, that participant was considered to have high variety of use. Based on this analysis, 29 participants were classified as having low variety of use and only six of them exhibited high variety. A discussion of the findings for each parameter follows.

Programming Choices. Participants were asked what they usually watched using the DVR. Responses included specific titles, program genres, or television channels. To simplify the analysis, each response was treated as a separate programming choice. Across the 38 separate individuals interviewed, the average number of choices named was 4.5, ranging from zero to 10, and participants who named five or more separate choices were treated as having high variety of use on this measure. Based on this, the results were close to even, with 17 participants having a high number of programming choices, while 18 had a low number.

Program Guide Selections Named. For this measure, participants were asked if they had ever selected programs from the guide. This could include programs watched on a regular basis or one-time selections such as a special or sporting event. All responses named were treated as a separate selection, including titles, genres, or channels. Participants who said they do not use this feature were counted as having low use for this feature. Participants averaged 1.9 program guide selections per person, ranging from zero to seven separate responses. Participants who named two or more different selections were

treated as having a high level of use for this feature. Based on this parameter, 12 participants had a high number of program guide selections, and 23 had one or none.

Search Parameters Used. Participants were asked what words they had used to look for programs through the DVR search features. Most responded with broad parameters such as title or actor name, as well as specific examples such as *The Apprentice* or Harrison Ford, respectively. To simplify the analysis, the researcher counted the number of parameters each participant named. The three most common responses were Keyword or Subject (12 mentions), Title (11 mentions), and nothing (10 mentions), meaning these participants do not use this feature. Other responses included Actor (9 mentions), Genre (such as sports or movies, 7 mentions), and Director (2 mentions). These results indicate that DVR owners have a clear sense of what it is that they want from television and how to find programs of interest. The average number of parameters named was 1.3 per person, ranging from zero to 3. Sixteen participants named two or more parameters and were treated as having high variety of use on this measure, and 19 had one or no parameters and thus had low variety for the search features.

Remote Control Functions Used. The number of remote control functions used at least once by a participant was counted during observations. Each specific feature used was counted, including functions involving only one button (pausing the set) and those using a combination of buttons (selecting a pre-recorded program from the menu system). Functions used ranged from zero to 9, with an average of 3.5 per person. Four or more functions used were treated as high variety of use, yielding 15 participants with high use of remote control features, and 18 with low use.

Rate of Use

Rate of use was operationalized as the amount of time spent with the DVR in relation to the overall time spent with television (see Table 4.5). Because the DVR is a dependent technology in the television cluster, its use is subsumed within overall television viewing. Participants were asked during the interview phase of the study how much time they spend with television and how much time they spend with the DVR.

Individualized Time with Television. For the participants in this study, the amount of time with television and the days and times spent with television are largely an individual matter. Responses were somewhat idiosyncratic and showed few clear patterns except that participants tended to view mostly during the evening. Some participants spend more time watching television during the workweek, some choose to watch more on the weekends, and still others say they have no set pattern because they have irregular work or academic schedules and just watch whenever they have time. This indicates that DVR owners take advantage of the enhanced ability to time shift programming to craft their own television lineups that fit with each individual viewer's own daily schedule.

DVR Almost Synonymous with Television. Generally, all or most of participants' time with television was spent using the DVR, indicating a high rate of use for this technology. All participants reported using the DVR on a regular and frequent basis, and some made no distinction between their time with the DVR and the time spent with television.

> Stacey Hooper: I connect it as one and the same, because I'm always using TiVo.
>
> Anthony Williams: Well, all of that time is TiVo-related time…I don't really make a big distinction between them at all.

Viewer perceptions of their time with the DVR can be easily captured by Alan Davis' comment, "It depends on how you define 'use the TiVo.'" Parti cipants who reported less time tended to limit DVR use to watching recorded programming.

> Tyler Martin: …onthe weekends I watch a lot on the DVR, to catch up on the shows…I like to take the weekends to sit there and also look ahead at the guide…to see what 's up…
>
> Jeremy Oliver: …we watch the *Daily Show* and that's always recorded…other than that it's kind of hit or miss depending on what we have…recorded…
>
> Shelley Bolton: I think only five hours a week…most of the stuff we watch live.

Those who report higher amounts of time with the DVR tend to think of it as encompassing both recorded and live content.

> Evan McClure: They really aren't…separate anymore. I mean, even if we're watching live TV, you always have that pause capability.

> Andrew Phillips: Yeah, because if I'm watching it live, usually, I'm pausing periodically, and I'm going to programs that I've already recorded, so I'm kind of doing two programs at the same time.
>
> Barbara Ellis: Oh, if we've got the TV on, the TiVo's [in use]…because we're at least…paus[ing], skipping the commercials…

Two Use-Diffusion Segments. Based on the above analysis, two of the use diffusion orientations illustrated by Shih and Venkatesh (2004) appear in the present study, indicating two use-diffusion segments for DVR consumption. DVR use can be characterized as specialized for most participants, who make up the primary segment. Rate of use was consistently high across the study; even those who report less time with the DVR still use the technology on a consistent basis every week. However, most participants, even those who use the DVR frequently, have low variety of use for the technology. These DVR users (1) have identified specific types of programming of interest to them; (2) have determined the precise DVR functions that are most relevant to their preferences; and (3) know how to employ those features to achieve their desired media consumption experience.

There are exceptions to this, however, as six participants—Richard Hall, Joseph Smith, Henry Jackson, Stacey Hooper, George Grant, and Anthony Williams—displayed an intense pattern of DVR use. All six of these respondents named five or more programming choices that they typically watch using the DVR. Five of them had at least two program guide selections and two or more search parameters that they used to find programs. Four of them used at least four remote control functions during the observation phase. Although these participants represented only 15 percent of the 39 individuals who participated in the study, they indicate the presence of a small but potentially important use-diffusion segment of intense DVR users.

Categorizing Households Based on Perceived Innovation Characteristics

DVRs were analyzed in light of Rogers' (1995) innovation characteristics of relative advantage, compatibility, observability, trialability, and complexity. Relative advantage was assessed by whether participants thought the DVR improved television overall, enhanced the viewer experience, or was superior to prior technologies such as the VCR. Compatibility was addressed by participant comments

such as the desire for specific features, a general interest in technology, or whether the DVR made an appropriate gift. Observability was gauged by whether participants had seen a DVR in use and the extent to which they had heard about it before owning one. For trialability, participants were asked whether they had used a DVR before owning one to indicate the difficulty of trying the product before owning one. Finally, complexity was assessed by asking participants to comment on the DVR in terms of ease of use.

Relative Advantage

Relative advantage is high for the DVR in this study. Participants as a whole were very positive in their assessment of the DVR, with many expressing a strong desire never to be without one again. Jeremy Oliver's comments were typical: "…once you have had something like this it's really hard to go back…and not have that…control." Most participants felt that the DVR had improved television overall and had made television a better value for the money they spent on subscription services, and a better use of their time with television in terms of flexibility.

> Joseph Smith: I just knew that it would make television watching simpler, easier, better, without a doubt…
>
> Evan McClure: …there's just too much on TV…and without TiVo it's impossible…to watch all the stuff that I'm paying for, that I would never have gotten to see, without the assistance of something like this…to get more value of my TV dollar, because I was throwing my money away…it's…impossible for me to get my money's worth.
>
> Paula McClure: I just think it's an awesome thing to have and it makes much better use of your time watching TV.

The DVR was also perceived as having relative advantage over the VCR in terms of the ability to pause live television and being easier and less cumbersome to use.

> Stacey Hooper: …just to record and be easier to record than the stupid VCR, that's just a nightmare.
>
> Bob Johnson: …you could record TV without VCR tapes…pause live TV if you get a phone call…right in the middle of *Survivor*…you don't have to miss it anymore.

Participants had a mostly negative assessment of television content in general, with most complaints centering on a perceived lack of originality and creativity, with a few raising concerns about excessive sexual content and violence. Many differentiated between the perceived quality of network

versus cable programming, with the latter perceived as being superior. Television as a medium was perceived as a powerful and quick tool for disseminating information to a large audience over long distances. Many had not changed these overall impressions of television since getting the DVR.

> Teresa Jackson: …the overall content I don't think with the DVR has changed. It's just changed our ability to…watch certain aspects of that content, I guess.
>
> Susan Rose: TV content is about the same, but it's just…more convenient TV watching…

However, those who had changed their impressions of television did so because the DVR had made it easier to "weed out" undesirable content and to find programming of interest. For these participants, the DVR had improved television.

> George Grant: I think it definitely…weeds out the crap that you don't want to watch, while letting you see the stuff that you do, stuff that is quality…
>
> Anthony Williams: It…helps television to live up to that potential by sort of weeding through a lot of the undesirable programming.

Some felt that the DVR had narrowed their awareness of new programs because they had created their own small repertoire of television content that became a routine.

> Stephen Bailey: I get to filter out the junk. So, I don't know what's on…I really don't know any of the good new shows on right now, just because…I haven't watched any current TV in a long time.
>
> Evan McClure: My impression of it, I guess, changed because…I don't know if I'm aware of as much content…I'm in a bubble now, because I know the stuff that I want to watch and I get that stuff, but maybe I'm missing out on stuff that's coming on…

Compatibility

Compatibility was high for the DVR in this study. Many participants expressed a general interest in technology that facilitated their interest in getting a DVR.

> Teresa Jackson: …my husband is somewhat gadgety…he didn't specifically ask for it [for Christmas], but it was something that I figured he'd like….
>
> George Grant: I've always been one to want to acquire new gadgets.

Other participants were attracted to specific features of the DVR, especially the ability to skip advertisements:

> Bob Johnson: …it rewinds and goes through commercials…

Brett Hall (age 13): Less commercials.

Richard Hall: …ability to not have to watch commercials…

Joseph Smith: I was expecting it to do exactly what it did…[including] the ability to skip commercials…

Participants found content manipulation features, including pausing and rewinding live television, especially useful in dealing with interruptions such as phone calls. Stacey Hooper, who has a two-year-old son, appreciates "being able to walk away [from the television set] and come back and not miss something…I do seem to depend on it a lot, so I just subconsciously like it a lot." Some DVR models allow the viewer to watch and record two programs at the same time. Participants who had this feature found it especially useful for avoiding conflicts when more than one desirable program airs at the same time, and those who did not expressed the desire to have it in the future. Finally, some participants had given or received the DVR as a Christmas gift or had ordered it as part of a satellite television subscription.

Observability

The DVR had a moderate level of observability for owners in this study. This was assessed by asking (1) whether participants had seen a DVR in use before owning one and (2) how much they had learned about the DVR before owning one. Most participants had seen a DVR being used, but most of them also had limited knowledge about it before getting their own. Participants in 19 of the 21 households said they had seen a DVR in use before they had one. Many had friends, relatives, co-workers, neighbors, or roommates who owned a DVR before they had gotten their own.

Stephen Bailey: My sister had one, my brother had one…Actually two of my sisters and my brother…I have another friend who has it too and he told [me] it's cool.

Tyler Martin: …friends of mine that are also in the computer…profession told me about the TiVo…word of mouth.

Charlotte Ball: There's a friend of mine …he's a co-worker of mine. He was talking about it, and…we were on the road so often, he's like, "Oh, I'll call my neighbor and have him TiVo that for me."

Susan Rose: I had one at my old house with my other; I had another roommate that had it.

> Andrew Phillips: Several of our neighbors have it, and they…discussed it with me and sort of told me how wonderful it was…and thought I would give it a try.

Others said that they had heard about DVRs through advertising or articles in newspapers or magazines. Observability was limited, however, because many stated that they did not know a great deal about the DVR and its features upon adoption.

> Teresa Jackson: I don't think I really knew a ton about it before we bought it.

> Ellis Lamar: …my concept of TiVo based on the limited advertising I'd seen…was very primitive compared to what I now know it can do…

Trialability

The DVR was low on trialability in this study, perhaps because of the still relatively low diffusion rate of DVRs across television households. Participants in only seven households had had the opportunity to use a DVR before owning one. These were persons who had lived with roommates who owned a DVR, or who had visited friends or relatives who owned one at various times before getting their own. For example, Susan Rose had used her former roommate's DVR before receiving her own as a gift. Stephen Bailey had visited friends who had a DVR built into their cable box and used theirs.

Complexity

The DVR is low on complexity for owners, but may be more complex for someone who has never used one. All participants expressed the opinion that the DVR was easy to use. The word "easy" appears in most responses to this question. Some thought the initial setup was cumbersome, but that regular, day-to-day use was simple to understand. Mark Mitchell thought the DVR was easy to use but acknowledged that the user had to take some time to become comfortable using the features, and that "somebody who's never used technology before probably would have a little more difficult time" using it.

Role of Media Clusters in the Home

Role of Television

To assess whether the DVR had changed the perceived role of the television cluster in the home, participants were asked about the roles of television and the DVR separately, followed by a question about whether the role of television had changed since participants had adopted a DVR. Briefly, the two

most frequently named roles for television were entertainment and information. Other roles included social utility, the perceived value of television within the household, relaxation or passing time, background noise, and television as a multifunctional tool.

Participants mentioned social utility as a role for television, with respect to both social relationships within the home and social utility outside of the household. Richard Hall referred to television as "a way to…bond" with others in the family. His son Brian, 15, focused on his desire to be aware of shows that his peers are viewing.

Some participants considered television to be of relatively low value in terms of its role in their homes, while others considered television to be an important part of their lives and would miss certain aspects of it if they did not have it in their homes. Joseph Smith had recently taken away television privileges as a punishment for his two sons, and felt that their behavior had improved while they had not been allowed to watch television. Beth Johnson said, "I don't think I'd really care too much" if she did not have television, and Barbara Ellis often turned on the TV as background noise.

William Franklin, on the other hand, said that "if I didn't have TV, I'd be in somebody else's house," especially to watch college football. Roommates Carrie Bowman and Shelley Bolton considered television to be the focal point of their apartment where they and their friends gathered to socialize. Mark Mitchell believed television had an important role in keeping him in touch with both information and popular culture. Some participants recognized both higher- and lesser-valued aspects of television. Henry and Teresa Jackson considered television to be an important part of their home, but when asked what it would mean not to have television, Henry responded, "I'd survive."

Participants saw both positive and negative consequences of not having television. On the positive side, Joseph Smith thought it would be a "relief" not to have television because his children were better behaved without it. Many believed that, without television, they would spend more time with other media, such as movies, or with hobbies, such as playing musical instruments. Jeremy Oliver stated that he would "probably…be a better guitar player" and Stephen Bailey would "read a lot more" without television.

Not having television would lead to a sense of social isolation for some.

> Charlotte Ball: I might feel like I was on an island…not being in touch with what's going on in the outside world…
>
> Evan McClure: If I didn't have TV but everyone else did, and I couldn't talk about stuff…shows and things, then that might be a little traumatic...
>
> Brian Hall (age 15): …my friends [would] talk about what happened, like what they watched on TV last night…and [I'd] be like, "Oh, yeah, well I didn't watch that…"

Another negative of not having television would be missing favorite programming such as college football or *Survivor*. Bob and Beth Johnson said they would miss television more in the winter when there is less to do outside because of the cold weather.

Role of the DVR

DVR Equals Television. Many participants felt the DVR had become synonymous with television and that it played a central role in their media consumption. This is similar to the findings for time spent with television, in which some participants made no distinction between their time with television and time spent using the DVR.

> Brett Hall (age 13): …basically the same as TV…
>
> Tyler Martin: …it's pretty much central…complimentary to the TV…
>
> Angela Jones: I mean, just entertainment…same thing as TV.
>
> Ellis Lamar: A big [role]. TiVo is, I think, synonymous with television.
>
> Alan Davis: I think of television and TiVo as synonymous.

Participants expressed strong feelings that not having the DVR would mean significantly less television viewing, and some said they would not want television at all without a DVR.

> Joseph Smith: I almost would rather not watch TV than watch it without…
>
> Henry Jackson: I wouldn't mind if I didn't have TV, but if I've got TV, I'm going to have a TiVo.
>
> Evan McClure: I wouldn't have TV without TiVo anymore.
>
> Anthony Williams: I would probably almost never watch television…
>
> David Gunter: I can't imagine going back and watching television without it.

Control. Control over content and timing of television consumption were major roles of the DVR within the home. Most participants felt that the DVR had enhanced their ability to control the content that they selected:

> David Edwards: …not to be jerked around by the networks is pretty handy.
>
> Brett Hall (age 13): …watch what we want to watch when we want to watch.
>
> Jeremy Oliver: …it helps us watch stuff more on our terms…you can watch things when you want to watch them.

The DVR represented a "compromising factor" in disputes over what to watch. Helen Franklin explained that, because their DVR is able to record two shows at the same time, she and her husband are able to see the programs that interest both of them.

Another important DVR role, similar to the findings for earlier research questions, was time shifting, giving participants the ability to decide when to watch preferred programs. Some participants felt that the DVR allows them to use their time more efficiently. Paula McClure said that the DVR "makes my time spent in front of the TV more quality time." The DVR allows users to control the pace of viewing through pausing and rewinding. Debbie Wilson thought of her DVR as a time organizer. Evan McClure thought the DVR could become a time waster because he feels more tempted to watch than if he were not able to find programs narrowly tailored to his interests.

Some participants placed a lower value on the DVR. Mark Mitchell described the DVR as "tedious" in that it requires the viewer to be proactive in order to get the optimal benefit, although he felt the efforts he made to select programs were worth the benefits of increased control over timing and content. Other roles mentioned included convenience, entertainment, and relaxation.

<u>Influence of the DVR on the Role of Television</u>

More Purposeful Viewing. The DVR has resulted in a change in the perceived purpose of television for many viewers. This change mainly centers on the notion of purposefully selecting programs versus watching television to "kill time," as Richard Hall put it. Bob Johnson said that he engaged in "a lot less…channel flipping" and Paula McClure no longer uses television as "background noise." This

change in the perceived purpose of television is related to a greater sense of control over television, and has led some to view television as more important and as serving more of an educational and informational role.

Viewer Sets the Schedule. A second change in the role of television perceived by DVR users involves viewer control over the television schedule. William Franklin felt that television had become less important, because he can be more flexible in deciding when to watch a program: "…we don't have to say, well, it's almost 8 o'clock…we both wanted to watch this show, we might want to go ahead and go." Participants can now take more time with non-media activities, because, as Carrie Bowman puts it, "I [don't] have to worry as much about being on the TV's schedule, it's on my schedule now."

"It changes the way media should work." Other influences on the role of television emerged from the interviews. The DVR may affect the television vernacular. Helen Franklin commented, "Our verbiage has changed, too…we say recording a whole lot more, or 'did you TiVo that?' Or, 'is that programmed in?'"

The DVR influenced interactions with television and other media, especially with respect to television schedules and content.

> Dan Wilson: I'd say organizational planner is a pretty good description…or maybe a sort of an editorial tool in a way…
>
> Paula McClure: Like, I have no idea what times things come on anymore.
>
> Helen Franklin: I don't think I've watched live TV in a long time.

Evan and Paula McClure had found themselves looking for a pause or rewind button on their car radios after becoming accustomed to having these features with television.

> Paula: …sometimes I'm listening to something on the radio…and I just want to replay it.
>
> Evan: Oh, I'll totally be in the car…and hear something on the radio and I'll be like, man, I missed that…I'll look, probably, physically for a replay button…But yeah, it changes the way I feel like media should work.

Finally, some participants believed that, although the DVR had improved their television experience, it had not affected television's role in their lives in a significant way.

David Edwards: I don't think so…we watch things from beginning to end more.

Anthony Williams: I don't think the role has changed. I think the utility has changed…greater ability to provide me with…the information or entertainment that I want when I want it, but I wouldn't say the actual role has changed.

Media Consumption Behavior

Media consumption behaviors analyzed in the present study included selectivity, preparation before media use, competing and complimentary activities, and attention to the set. Selectivity was measured by asking participants how they select programs to watch and whether they decide what to watch before or after they turn on the television set. Preparatory behavior was measured by asking if there were any activities viewers typically engage in before they begin viewing. Competing and complimentary activities as well as attention to the set were measured during the observation portion of the study.

Selectivity

DVR as a Decision Tool. All participants use the DVR's menu of prerecorded programs in deciding what to watch. Viewers also use the on-screen menu of programs that are available to record, which can be narrowed by categories such as movies, comedies, or talk shows. As reported earlier in this chapter, many participants search for programming by typing actors, directors, or keywords into a search engine and viewing a list of relevant programs. Richard Hall felt that the "menu allows you to find things that you're looking for, things you found while looking up something else, and…allows you to find your stuff." The program guide also helps participants select programs by scrolling through the listings to select programs that are currently airing and to schedule future recordings. Some DVR models include an artificial intelligence feature that lists recommended programs based on prior selections, but participants rarely use this feature.

Participants had different views on whether the DVR had influenced how they select programs. For some, the DVR had replaced print sources such as *TV Guide*. Another participant commented that because he was able to automatically record every episode of a particular program, he began to tire of it once he realized he had seen all of the episodes in a short period of time. The DVR also assists household members in resolving conflicts over which program to watch or record in homes where the DVR is

equipped with a dual tuner. Finally, one couple did not feel that the DVR had influenced their decisions about what to watch.

Non-DVR Selection Methods. Participants were influenced by other factors in deciding what programs to watch, sometimes in conjunction with and sometimes independent of the DVR features. For example, many watch shows out of habit. Brian Hall, age 15, uses the DVR to record a favorite program that comes on "at like, one in the morning, so I just…watch it the next day." His father, Richard Hall, likewise commented that the DVR facilitates habitual viewing of programs that come on at inconvenient times.

Other participants enjoy specific genres of programming, such as Bob Johnson, who has an affinity for "competitive" programs such as sports. Another influence on selectivity is mood.

> Joseph Smith: …sometimes I'll get in bed and…try to figure out whether I want to watch something serious or a comedy…Usually I kind of know what I want to watch, but say, about 25 percent of the time, it depends on the mood I'm in.
>
> Stacey Hooper: …depends on what mood I'm in that night.
>
> Helen Franklin: Whatever we're in the mood for that day…usually we'll go through the guide and just see what's on and just pick it that way.

Social interactions served as another method of selecting programs. Jeremy Oliver and his wife Cindy sometimes negotiate what to record and watch based on "who wants to watch it more." Other participants hear about programs through word-of-mouth at work and school. Finally, some are occasionally exposed to media messages that influence their viewing and recording decisions. These media sources include promotional spots on television, entertainment magazines, and news programs.

Preparatory Activities

Participants felt that they could take longer to complete tasks before watching a program that was stored on the DVR because it would "wait" until they completed them. This is related to the greater sense of freedom with scheduling television viewing expressed in earlier findings in this chapter.

> Richard Hall: …what we've found ourselves doing is you say, "We're not going to start watchin g this show…until you have these five or six things done."

> Beth Johnson: Before we got the [TiVo], because there'd be a program on and like, *Survivor*, we'd want to watch, and he'd be like, shoving us all out the door to get us out the door so we could get back in time…
>
> Phyllis Davis: …except that before TiVo that we maybe had to plan to do things because we wanted to be home to watch that show when it starts…if we're going to go out to dinner we need to be home by 9 o'clock…now, you don't have to do any of that, because the machine is doing all the work.
>
> Helen Franklin: We have a better dinner…It's a much more relaxed dinner atmosphere…It's not like, "Uh, *Friends* is on. Let's just eat spaghetti in front of the TV!"

However, participants did not perceive that the DVR had influenced the specific activities that they engage in prior to watching television, except that they could take longer to complete tasks before beginning a program. Preparatory activities mentioned during interviews included work, chores, food preparation, eating, personal activities, turning down the lights, and nothing. Chores and work activities included folding clothes, homework, feeding pets, computer work, cleaning, and laundry. Several participants typically prepare and/or eat a meal before watching television, with a few preparing a meal while they watch a prerecorded program on the DVR. Personal activities before viewing included exercise, using the restroom, brushing teeth, and getting ready for bed. One participant and his wife occasionally turn down the lights before watching a special, but they usually don't engage in any particular activity before watching a program.

Competing and Complementary Activities

Most participants engaged in complimentary activities during the observation portion of the study (see Table 4.6). Twenty-six participants ate or drank, two had alcohol, and one smoked a cigarette. The McClures ate at their living room coffee table while watching a prerecorded program. Others were eating snacks or sipping on a drink as they watched television. Many participants talked to the set. Alan and Phyllis Davis cheered for a contestant they were rooting for on *Survivor*. Roommates Ellis Lamar and George Grant discussed the programming they watched throughout the observation period. The McClures disagreed with judging decisions while watching a prerecorded Olympic event. Others laughed at portions of the programs they watched.

Competitive activities were mostly brief and lasted only minutes or seconds. The primary participant in each household generally engaged in fewer competing behaviors than other household members present for the study, indicating that not all household members are equally involved in the programming. The most common competitive activities were leaving the room and interacting with pets. In most households, at least one participant left the room at some point during the observation. These instances involved a very brief exit, and in these cases at least one other person continued to watch without pausing. The other most common competing activity was interaction with a dog or cat, although most participants continued looking at the screen while engaged in this activity.

Two couples performed kitchen-related activities. The Johnsons were cleaning the kitchen when the researcher arrived, after which they sat down to watch a recorded program. The McClures prepared, ate, and cleaned up dinner during the observation. After eating, the couple washed dishes together while watching television on the kitchen set, which is connected to the living room DVR via a home networking system. This allows them to watch the same prerecorded program in the kitchen that they are watching in the living room.

Other competing activities included reading, writing, interacting with children, and hobbies. Tyler Martin spent time typing on a computer and playing his electric keyboard, both of which are situated so that he can watch television while performing these activities. Richard Hall and his 13-year-old son Brett conversed about the program they were watching and other topics, and Brett spent part of the time playing solitaire.

Pausing the Set

Pausing the set while watching television on a DVR creates a new category of interruptive behavior (see Table 4.7). These activities were coded separately from competing and complimentary activities. Most households, 14 out of 21, paused at least once during the observation period, but nine of these households paused only once. The pause feature is used consistently across DVR households, but infrequently within a single program.

Most pauses were brief, although a few lasted between five and seven minutes. All of these longer pauses involved a participant answering the telephone. For example, Beth Johnson answered the telephone and talked for about five minutes, but her husband Bob paused the television until she finished the conversation. Barbara Ellis paused the set while her partner David Edwards answered and talked on the telephone for six minutes, and Alan Davis paused the set while his wife Phyllis talked for seven minutes. David Gunter had the television set on pause when the researcher arrived for his observation session, because he had a visitor in the home who left within five minutes of the researcher's arrival.

Two participants, Henry Jackson and Andrew Phillips, used the pause feature to watch multiple programs at the same time. They simply paused one channel when the commercial break began and switched to a second program on another channel. When the second program went into a commercial break, both Henry and Andrew paused the second program, returned to the first channel, fast-forwarded through the commercials, and resumed watching the first program that they had paused. They would repeat this process every time a commercial break began.

Attention to the Set

Attention to the set was assessed by measuring eyes-on-screen (EOS) times for television programming (Table 4.8) and for commercial breaks (Table 4.9). EOS time for television programming was measured in three five-minute segments throughout the observation period. In one situation, two segments were measured because the participant spent about an hour demonstrating DVR features to the observer, after which he and his son began watching a 30-minute program that had been recorded. Due to time constraints, the researcher was only able to take two measures during this particular observation.

High Attention to Programming. The researcher completed 59 EOS measurements for television programming across the 20 DVR households observed. DVR users are highly attentive while watching television programming. The mean EOS average for programming was 85.1 percent, and individual averages ranged from 25.5 to 98.7 percent. The participant who averaged 25.5 percent spent time working on his computer, hanging a picture, and playing his electric keyboard while watching television. Another participant whose EOS average was 32.6 percent read magazines and used a laptop

computer during the observation. Excluding the two low averages, the mean would be 91.3 percent. Of the 59 separate EOS measures taken during television programming, only six were under 50 percent. Only three participants had at least one segment under 50 percent, and only two had overall EOS averages under 50 percent.

The findings of the present study are consistent with prior research that indicates that DVR users, like their non-DVR counterparts, have lower levels of attention to the set when they engage in competing activities while viewing (Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991), although, in this study, these averages remain relatively high. The lowest EOS averages were recorded when competing and complimentary activities were performed at the same time (70.4 percent), but the average was still high overall (Table 4.10). The average EOS when any competing activity was performed was 71.9 percent. The highest level of attention to the television set occurred when no competing activities were present (99.7 percent) and when no competing or complimentary activities were recorded (92.3 percent). Table 4.11 lists activities recorded during all EOS measures.

EOS times were higher than for prior studies on pre-DVR viewers (Allen 1965; Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991). These studies indicated that viewers typically paid attention to the set about two-thirds of the time from the three-network universe of the 1960s through the cable and VCR environment of the 1990s. The present research finds an average EOS measure of 85.1 percent for viewers watching regular television programming with a DVR, which is higher than the 81.7 percent average that Krugman and Johnson (1991) found for VCR movie rentals. Even when engaged in competing activities, DVR viewers' attention to the screen averages about 70 percent. This upward shift in attention to television programming indicates that viewers have altered their media consumption strategies in the DVR environment. Table 4.12 compares eyes-on-screen measures in this study with previous findings.

Low Advertising Viewership. Advertising viewership in this study was too low to meaningfully quantify. Only three EOS measurements were completed for advertising breaks across 20 homes observed (Table 4.9) and only two participants engaged in any commercial viewing at all. Stacey Hooper watched

one advertising segment and looked at the screen 95.4 percent of the time. Shelley Bolton watched two commercial breaks and looked at the screen 68.7 and 66.3 percent of the time, respectively. The average EOS score for all 20 households measured is 3.84 percent, the average for the two participants who watched is 38.4 percent, and the average for the three ad segments measured is 76.8 percent. All of the other participants fast-forwarded, switched to another pre-recorded or live program, or left the room during advertising breaks, including the two participants who paused one channel and watched another simultaneously. These DVR users typically did not watch advertising. Those who did watch, however, tended to be highly attentive.

Social Aspects of DVR Use

Social Use of Television Within the Home

DVR as a Socializing Agent. Research Question 11 asks how DVR homes can be characterized in terms of group versus individual viewing, who uses television, who decides what to watch, and rules for watching or using TV with the DVR. Group versus individual viewing was assessed during the interview and observation portions of the study. Interview data show that DVR use typically occurs with more than one person in the room. Participants generally spend most of their viewing time with others and less time watching alone, although this finding may be an artifact of the study, since interviews typically occurred in social areas of the home such as living rooms, dens, and kitchen tables. Group viewing tends to take place on a main television set that is typically the set connected to the DVR, while solitary viewing takes place on a secondary, non-DVR set.

Of the 20 households observed, three consisted of a single person living alone (Mark Mitchell, Charlotte Ball, and David Gunter), and three others involved individuals in multi-person households who were watching television alone (Tyler Martin, Stacey Hooper, and Stephen Bailey). The other 14 homes had more than one person in the room during the viewing session. The observational data are consistent with participant comments during the interviews that DVR use tends to occur with more than one person in the room.

In homes with more than one DVR, varying patterns emerge. In some homes, multiple sets are connected to the same DVR via a home networking system. In such situations, each set connected to the system is automatically tuned to the same channel. Evan and Paula McClure have such an arrangement between their living room and kitchen television sets. Both sets respond to the DVR remote, and whatever channel is tuned on one will be tuned on the other. During the observation portion of the study, the couple was able to continue a previously recorded program they had been watching in the living room during dinner while cleaning up the kitchen.

In other cases, multiple DVRs are not connected. Richard Hall and his wife (who was not present for the study) have a DVR connected via home networking system to the sets in their family room and master bedroom, while their children have a separate DVR in the basement. Henry and Teresa Jackson have a "main" DVR in the living room that the couple uses together and Teresa uses to record her programs, and a second DVR upstairs that Henry uses to record sports and other programs of specific interest to him.

DVR Gender Roles. The question of who primarily uses television within the home was addressed in the pre-interview screening questions and during the interviews. Of the 18 multi-person households studied, 13 involved a male-female couple and five consisted of roommates, two all-female and three all-male households. Of the 13 male-female households, nine claimed that both partners used television equally, with only four reporting a primary television user. The male head-of-household was the dominant viewer in three of these homes. Also, different sets within the home had a different primary user. Secondary sets tended to be used primarily by the female head, with either the male or both persons using the "main" set about equally. In the five roommate households, all reported that one roommate was the primary viewer.

Most household members use the DVR, but most also have one person who is the home's dominant user. This distinction clearly falls along gender lines in households with a male and female head. While most of the male-female homes had rather equal use of television, and both partners do use the DVR regularly, the male head-of-household was decidedly the *primary* user of the DVR. Although

eleven of the 13 homes claimed that both male and female used the DVR frequently, only one reported the female head as the person who used the DVR more often. In one home, the female partner did not watch television, and the female who was the primary DVR user in her household reported that her husband rarely watches television and prefers video games. In the five homes with same-sex roommates, four reported one roommate as the primary DVR user.

Gender Roles and New Technology. In assessing who makes viewing decisions within the household, participants were asked who chooses what to watch and who chooses what to record and playback on the DVR. Observation data coded which participant held the remote control. In the 13 households with a male-female couple, the male chooses what to watch in five homes, the female chooses in three, and the couple makes a joint decision in five. The female head-of-household tends to choose the programming on the non-DVR set. In three of the five households consisting of roommates, one person tends to make decisions for the rest of the group, while two households watch television based on a mutual decision. Participants in all roommate households claim to have similar taste in programming, and therefore, very little debate over what to watch.

In terms of who chooses what to record and playback on the DVR, there is a distinction between (1) who makes the *decisions* about what to record and (2) who actually *programs* the DVR to record. In the male-female households, each spouse or partner makes decisions about specific programs they want to record on the DVR. These decisions are made about programs for the couple to watch together and for content of specific interest to one person. Furthermore, most couples have enough programs that they both enjoy, so that whatever one person chooses is usually acceptable to the other. Of the 13 male-female households interviewed, six claimed that both heads-of-household share in the decision-making over what to record, the male decides the most in six homes, and the female head makes the most decisions in one.

The male head-of-household tends to be more dominant in terms of actually setting the DVR to record a program, with nine households reporting that the male performs this function, three reporting shared programming activity, and one reporting that the female programs the DVR the most. So, even when a female head-of-household makes a decision to record a program on the DVR, she will often ask

her spouse or partner to set up the recording for her. In four of the five roommate households, one person decides what to record and the other household members usually agree with that choice, while one household reports that both roommates jointly decide what to record.

The question of who holds the remote control was coded during the observation portion of the study and indicates that male household members are dominant in this role. A female held the remote control in seven of the 20 households observed. One of these women lives alone, and two others are roommates in all-female households. That leaves four households with a male-female couple where the female held the remote. In one of these homes, the husband did not watch television, and even here, the participant called her husband into the room at one point to ask him a question about how to delete a program. In the three homes where a female held the remote control with a male present the entire time, two of them handed the remote to the male household head at some point. This leaves only one male-female household where the female held the remote control for the entire observation period without handing it to the male head. Disagreements about what to watch were only coded in two households, indicating that DVR users within a household tend to agree on most programming decisions.

Limited Rule-Making. DVR homes generally do not have hard-set rules, spoken or unspoken, for using the DVR. Two homes with children present had some restrictions on the children's use of television and the DVR, including use of parental controls.

> Richard Hall: …we usually use the security code to make sure that the proper things are being watched.
>
> Joseph Smith: No television before [4 p.m.]…

In one roommate household, George Grant owns the DVR, so his roommate lets him have priority in deciding to record and delete programming.

> Ellis Lamar: …it's understood with [George] that my programs get trumped because mine record so frequently…I mean, it's [George's] machine, so…implicit for me that I usually let him…unless I really want to rec ord something.

Another participant tries to keep a habit of not letting the DVR hard drive fill up with programming.

> Mark Mitchell: I try to not let the programs build up too much. I try to keep watching so that it doesn't, I don't want to ever run out of recording time.

Most of the rules that do exist relate to decisions about deleting programs. Household members are generally expected to delete their own programs when finished watching them, not to delete another person's programming, to make sure that everyone interested in a program gets to see it before deleting it, and to ask before deleting if unsure.

> Evan McClure: You better not delete anything that I like…
>
> Helen Franklin: Ask before you delete.
>
> Richard Hall: See, part of the rules, simple rules, like if there's a show that you've watched, you have to erase it…[if] he's recorded two hockey…shows and he hasn't watched them and he's not going to watch them, I want them off.
>
> Carrie Bowman: Maybe when…everyone's watched a show, delete it…don't let it fill up.
>
> George Grant: I guess if, for instance, if [Ellis] is watching a program that I haven't seen, or vice versa, pretty much save it until the other's seen it before we delete it.

Others have priorities for what to record when the DVR does not have a dual tuner.

> David Edwards: …if it has to skip away to, like last night when it asked if it could record *Futurama* instead of whatever we were watching…if we're actively watching something then it takes precedence.
>
> Susan Rose: …if you were watching TV and then the TiVo wanted to change the channel [to] record something, I think we should…let it change the channel…

Finally, one household practices the courtesy of pausing the set whenever one household member leaves the room to, say, answer a phone call or use the restroom.

> Dan Wilson: …if one of us has to go out of the room, we'll pause it.
>
> Debbie Wilson: …we do pause it if one of us gets up to go out of the room...

<u>Expert for DVR</u>

Similar to Morrison's (1996) finding that most homes have one person who is considered to be the "computer expert," interview data for the present study indicate the existence of a DVR expert within the home, with two caveats. First, the perceived gap in proficiency between the expert and other household members is small, and second, the expert is rarely consulted for advice on using the DVR, perhaps due to the low perceived complexity among users. In other words, most DVR homes have one person who is seen as more technology-savvy and better at "driving" the DVR, as Teresa Jacks on called

it, but the DVR might be thought of as an "easy" computer that other household members can learn to use comfortably.

All 18 multi-person households had one person who was perceived as more proficient at using the DVR than the others, although, again, the gap was considered small. All three participants who lived alone felt satisfied with their own proficiency in using the DVR. Among the 13 male-female couples, the male was perceived as most proficient in all of them, even in the home where the female was the primary DVR user. However, most reported that gap was close, that the female head is comfortable in using the DVR for her own purposes, and that she rarely asks for assistance.

> Teresa Jackson: He's better. I'll just give it up. He's the more techno, gadgety guy, but I'm pretty proficient on it, but he's a better…TiVo driver…
>
> Helen Franklin: I've gotten good, though…I just took the time to learn…I think we're pretty even.
>
> Barbara Ellis: If at all, I would ask him how to do something…I can't even think of anything that I would want to do that I don't know how to do, but it would certainly go that way, he would never ask me.

The DVR expert within the home is rarely asked for advice. Most of the advice that had been asked took place when the DVR was first adopted, and declined over time.

> Evan McClure: Maybe in the beginning [Paula] would have asked me, "How do I do this, how do I do that?" But that was when we [first got it].
>
> Mark Mitchell: Not recently. Maybe I did [ask for some help] first week I had it, but not anymore.
>
> Barbara Ellis: Well…when we first got this machine, I hadn't used his other one much, so…I just said, "Okay, what do I do?" But it was pretty simple, so…

In the male-female homes, the female always asked the male for advice when it was sought, mostly with respect to setting up a recording or using search features. In addition, Ellis Lamar had asked his roommate for help with recording.

> Joseph Smith: …usually what it is, is record…all of them will ask.
>
> Debbie Wilson: I've asked him how to use the record by time, by channel thing.
>
> Paula McClure: Probably like, how to set up the Season Pass.

Ellis Lamar: How to search for programs that I want to record…how to navigate more advanced menus…

In the Hall household, family members, including the children, ask each other for help in using the DVR, and tend to resolve such issues together as opposed to one person serving as the strict "expert." In the five roommate households, some participants will occasionally ask the "expert" for help in setting the DVR up to record a program, but again, this rarely happens. Most participants in this study are satisfied that they know enough about the DVR to use it for their purposes, and that if they ever need to know more, there is someone they can ask.

Internal and External Social Utility

Conversations during Media Use. Internal social utility was measured by coding the conversations that took place during in-home observations. Four types of conversation were included on the observation coding form: non-program conversation, program-related conversation, asking for advice, and discussion of rules. In the six homes where the participant was watching alone, no program-related conversations were coded, so these homes were not included in the analysis (see Table 4.13). In two of these homes, a non-participating household member entered the room briefly and engaged the participant in non-program-related conversation, which was coded.

Conversation patterns for watching television programs in a DVR environment differ from previous findings (see Table 4.14). Program-related conversations in the present study averaged 9.4, while conversations on non-programming topics averaged 4.4. Prior research has found 5.3 conversations on the program and 5.0 conversations on other topics during television programming, and 9.9 program and 3.4 non-program discussions for VCR movie rental viewing (Krugman and Johnson 1991). Like the eyes-on-screen measures earlier in this chapter, the conversation data indicate that watching regular television programming on a DVR is qualitatively similar, for the viewer, to watching a movie rental. No conversations about DVR rules took place, and only two observations recorded someone asking for advice in relation to DVR use. Both involved a female head-of-household asking the male head for help with something.

Visitor Experiences with the DVR. As mentioned in the literature review, external social utility can include having outside visitors watch television with household members or discussing television programming with other persons outside the home. On the first question, most participants had had friends and/or relatives watch television in their homes with them at some point, and many of these had allowed a visitor to use the DVR. These visitors' experiences with the DVR indicate that perceived complexity varies across individuals, and differed in terms of confusion and a particular visitor's comfort level with technology. Bob and Beth Johnson, for example, reported that while Bob's parents found the DVR confusing, Beth's mother, who has a digital cable service of her own, was comfortable using it.

> Bob: [My parents] had a lot of problems. They're…used to having the up and the down for the volume and an up and down for the channels…they didn't understand you could browse through the listings on the bottom of the screen without changing the screen image…they couldn't really grasp how to…browse and search…even though I'd explain it, they still didn't quite get it, there's too many buttons for them…
>
> Beth: My mom's used to it. She's got digital cable at home…very similar, so…

Debbie Wilson reported that her father found the DVR confusing when he first used it, but was more comfortable with it than with a previous television subscription.

> My dad used it, which was really amazing…because he's not very good on technology at all…he was a little confused about it at first, but less confused about this integrated system with the program guide than…when we had DirecTV alone.

Other participants reported that some visitors had decided to buy a DVR after using theirs:

> Evan McClure: My dad bought one…onmy recommendation, and after using ours.
>
> Phyllis Davis: My sister was here…shortly after we got it and when they got home her husband was…so crazy they had to go out and get one…

Most visitors who used the DVR had used the non-DVR related functions such as changing channels and adjusting the volume. Mark Mitchell was hesitant to allow others to use his DVR because he was concerned that someone might accidentally delete something he had recorded.

The DVR in Discussions about Television. Participants tend to mention their DVR when discussing television programming in conversations outside the home.

> Debbie Wilson: [I] haven't seen it …or don't tell me what happened on *ER* last night, because…I haven't watched it yet and I'm watching it tomorrow.

David Edwards: …they'll say "Did you see such and such," and I'll say, "No, but I TiVo -ed it."

Richard Hall: I have when people are talking about TV or their…favori te movies or sports or whatever. I endorse it. If somebody is a sports fan I say, "Well, then you should get it," or if they're movie buffs, or whatever, I recommend it.

Paula McClure: Pretty much just in conversation, somebody's like, "Did you see that l ast night?" I'm like, "Oh, no, I didn't record it," or you know, "TiVo's got it, and I'll see it when I have time for it," or something like that.

Besides mentioning the DVR when discussing television programs, many participants have discussed the DVR itself and have encouraged others to get one.

Mark Mitchell: I try to promote it.

Joseph Smith: Someone at work…the subject comes up now and then…if you don't have one you've got to get one…I usually highly recommend them.

Tyler Martin: Major proselytizer…a nyone who mentions watching shows or having VCRs, I'll just…say, you have a TiVo you never go back…

Andrew Phillips: …we should get paid from the folks that do the TiVos because we're selling it to other people all the time.

Some commented that they have encountered difficulty trying to explain the DVR concept to non-users:

Tyler Martin: …people who don't have DVRs don't know, you just can't explain it to them until they get it, and then they're addicted…

Helen Franklin: I've talked about it with people that don't have a TiVo, and they don't understand…exactly what you're talking about…it's difficult to explain the benefits to someone who's never experienced TiVo…

George Grant: …it was such a kind of bizarre box to explain…when they first hear about it t hey don't know what it is. I try to educate them…it's odd to talk about it…it's hard to describe everything that it can do.

Other participants have friends whom they describe as "geeks" and who have an interest in technology in general, and they tend to discuss the technological aspects of the DVR.

Jeremy Oliver: …the people I work with are geeks and so this is…the kind of thing that some…like to do.

Anthony Williams: …a lot of my friends are into, because they're computer geeks, they're sort of into the whole modification of hardware thing.

Finally, Bob Johnson said he discussed the DVR with others more often when he first got it, but less as time passed: "When we first got it, it was the big toy to talk about, so, kind of I think, everybody's sick of it…it's not as new as it used to be so I don't talk about it as much."

Table 4.1: VCR as Launching Pad for DVR Conceptualization

N	Name	How would you describe your DVR to someone who doesn't know what it is?
1	Richard Hall	I would describe it as…**like a VCR** only you're recording onto a hard drive.
2	Bob Johnson	I'd tell them it's a… **video recorder without a videocassette**….And it lets you pause live TV.
4	Joseph Smith	…it's a **digital VCR**…. but it gives you….all of the…functions that come with digital, being able to time-skip more than just what you can do with a typical fast-forward.
6	Debbie Wilson	I would, I'm trying to figure out how I would describe it to my mother the first time….I guess I would consider it like a, **a real time VCR**.
	Dan Wilson	I would kind of also tend to use the **VCR analogy**, but more of like, you know, the, it automatically records the things you want to watch…
7	Helen Franklin	It's kind of like um, **kind of like a VCR**….It's a **VCR recorder without having a tape**….
8	Paula McClure	to me, I think of it as a **digital VCR**…
9	Tyler Martin	I'd say it was a, **like a VCR**, only it uses a hard disk like a computer.
10	Jeremy Oliver	If I was describing it to my mother, I would probably describe it as something like a **supped up VCR** that you can, I would describe some of the functions, you can pause live TV, you can rewind, you can, all the different things that you can do with it….I'd probably **start with the VCR thing, because I know she knows what a VCR is**….
11	David Edwards	I've been telling people that it's **like a VCR** except that, uh, it's smart enough to record programs proactively…
	Barbara Ellis	…**like a VCR** only it doesn't record it onto tapes, would be the thing that I would say, it records it into a computer.
13	Charlotte Ball	…a **VCR that's easier to use**…
14	Shelley Bolton	…it's just **like a VCR without the tape**, and it's so much easier to record stuff…
16	George Grant	…kind of the **ultimate VCR** where you can record stuff and have it set to your favorite shows…
19	Andrew Phillips	It's like a VCR type recorder, but you don't have to pop tapes in and out…
	Gina Phillips	It's a **VCR that actually operates** (laughs).
20	Alan Davis	A **VCR on steroids**…because um, it's just smarter than a VCR…
	Phyllis Davis	**Like a VCR**, only much, much better.
21	David Gunter	**Digital VCR.**

Table 4.2: Participants Who Do not Perceive DVR as Interactive

N	Name	Scale*	Comments
1	Richard Hall	3	I understand that it is at a level that we don't appreciate…in that they know every time that we pause, every time we rewind, every time we go back and watch a scene over again, that DirecTV or Tivo or somebody knows that that information can be watched….But, but that's passive, that's a passive but not potentially what… I think it's potential is not nearly realized or utilized and again I think that what we don't understand, what we typically don't understand, the public doesn't understand is how much information they are mining from us…I would say from our utility, probably a 3….From their utility, probably a 7.
2	Beth Johnson	3	….I don't know that I would consider the TiVo really interactive.
	Bob Johnson	3	Yeah, I don't think it's interactive either. I think it's a good, I mean it arranged in order to find stuff but I don't think that makes it interactive.
4	Joseph Smith	2	I guess technically it is because it has the TiVo suggestion box which would definitely be considered a sub-type of interactivity. And, the, it is my understanding that TiVo actually records the viewing habits of it's uh, subscribers. Uh, so I guess in that respect it's also interactive, because, uh, the networks get, get to uh, (laughs) get the stats on uh, what TiVo says people actually watching, which is, kind of puts Nielsen in a hard spot doesn't it?
8	Evan McClure	6-7	But I don't really think TiVo is interactive television…Yeah, I mean, like, but, yeah, that was my answer to that question, (?) what does interactive TV mean, (?) interactive, the actual production of the show somehow, the show's changing because I did something. Well, there's a couple of ways to look at that actually, I think, uh, because the TiVo itself wouldn't do anything if I didn't interact with it, so in that sense, it's a 10, but the stuff it's showing me, besides being able to pause and rewind and do that kind of stuff, I can't change what's actually shown, you know, except for the temporal stuff, you know, when and where it's shown um, and so, in that sense it's probably a, you know, a six or 7…

Table 4.2: Participants Who Do not Perceive DVR as Interactive (Continued)

N	Name	Scale*	Comments
10	Jeremy Oliver	4-5	I don't really consider this interactive…I might give it say, a four, or five…It, it's better than just being able to, (?) like a one-channel radio where you turn it on and turn it off…I do acknowledge that there is some communication going on, but it's, I don't see really two -way…Yeah, yeah, I, I look at it as, you know, I get much finer control over what the thing does…
11	David Edwards	2	Um, not really, I mean they try to push ads to you, like the go look at the (?) or something like that. That's a very low level of interactivity. I don't think there's much there. Uh, they have the capacity to do two-way stuff, except that most of their uploads, I think are done batch-wise now. Uh, but, I mean there's no reason I couldn't do, using the wireless network, um, interactive stuff with TiVo and they just haven't, uh, that I've seen, done anything, beyond that very low level.
12	Stacey Hooper	3-4	I don't really. I mean, it's just you know, it's a place t o house everything, but it doesn't really give you the ability to you know, involve yourself with that particular scene in any way. I don't know, probably about a three or a four, just because I mean, you somewhat have to involve yourself with it, but you don't put yourself in it, I guess.
13	Charlotte Ball	2	No….I mean, it's not interacting with me. I might be interacting with it, but I think that it would have to be both sides to be interactive.
20	Alan Davis	1	When I use it with the TiVo suggestions turned off…(pause) I'd give it a one.
	Phyllis Davis	0	I'd say the same thing, if you had the suggestions functionality put back on or using that, it's probably in the realm of something like a 7 or 8, but the way we use it now, it might be (?) almost a zero. A zero to one, I mean, it's just like, it's not really interacting with us, we are telling it what to do, and it's doing it.
21	David Gunter	3	TiVo doesn't come to mind when I think of interactive television…I suppose um, in the showcases, it's like a computer program in that I can drill down through what's sort of like a video magazine where I can, I can do that, I guess a little bit.

* Participants were asked to rate the DVR on a scale of 1-10 with 10 being fully interactive and 1 being not interactive at all.

Table 4.3: Participants Who Perceive DVR as Interactive

N	Name	Scale*	Comments
1	Brian Hall (age 15)	5-6	I think it' s very interactive, because, just because you can watch what you want. You don't have to see everything. It' s like you have your own lineup. Well, I' d say compared to anything else, it' s probably a 9 or 10, b I, I think that with what technology is right now, it's probably, I mean it could be a lot more interactive, so about a 5 or 6.
3	Mark Mitchell	7-8	I consider a…DVR to be a part of interactive television. I guess, um, I guess like a 7 or 8, I think. Obviously, I guess that you could make it so you could talk to it or, (?) maybe more interactive using a remote control, you know. You know, I guess it, so, I guess it could always become more interactive….There's always room for improvement.
5	Henry Jackson	7	Seven.
	Teresa Jackson	7	I'd say a 7.
6	Debbie Wilson	7-8	Yeah. I would say ours is, because we've taken the time to train it. I'd have to say about a 7 or an 8.
	Dan Wilson	7-8	I suppose it is, because we got a, you know, you know means of controlling it and do, you know, doing things other than just letting it play continuously or something, you know, you can, you know tell it to back up, or skip ahead or, or stop and do something else. Um, it's interactive in that sense.
7	Helen Franklin	8	I'd say 8…Because, it's still limited. Even though, I would say TV is very low on that scale, this would still has, still has its limits…It's on the high end…but it's not say, it's not giving you too much interaction.
	William Franklin	9	I'd say 9, because it's, I mean, true, full, like interactivity would be you know, at any point in time, you walk up and say I want to watch this movie, and it pulls that movie up and I watch that movie…Or I want to watch, and I know they're working on that, or whatever it's called in demand, on Charter, whatever, that you just say, it has a library of all these movies, and you tell them you want to watch it.
9	Tyler Martin	7 ½-8	…with respect to the TiVo, of course you have much more interactivity as opposed to television, television used to be a medium where you had no control. Now you have total control.
14	Angela Jones	7	Oh, yeah, I mean, I guess. I feel like I'm, we're putting in what we want to watch, telling it you know, doing stuff for us…And since I'm working with the television to get what I want.
	Susan Rose	9	The same thing, I mean, you know, we tell it what, like, you want to record and sometimes it'll like, record stuff that it thinks you'll like…
15	Carrie Bowman	6	Yeah, because you can rewind and fast forward and all that good stuff.
	Shelley Bolton	7	Same…you can mess with it…

Table 4.3: Participants Who Perceive DVR as Interactive (Continued)

N	Name	Scale*	Comments
16	George Grant	6-7	…yeah, I…would…as far as your telling it, uh, based upon your ratings and, and, and what you're recording, you're telling it what you want to see, and it, you know, and the, and the uh, Tivo menu, it tallies, it has it listed you know, this is what you like.
	Ellis Lamar	6-7	Yeah…Um, because uh, because I can tell it what I like and it will um, do the rest of the work for me.
17	Stephen Bailey	8-9	Yeah…Eight or nine.
18	Anthony Williams	4	Um, yeah, I would say that it's interactive in the sense that, that it allows you to re, to use your input as preferences and things like that, but the actual content is still pretty static.
19	Andrew Phillips	6	You know, I guess the menu system itself, is interactive as far as, um, if I type in, if I look on guide and I see a program that I say, gee, I wonder if there's anything related to that, I can switch over to another type Tivo, type in a word and it'll go out there and search for programs….I'm interacting with the TV to find things that I'm interested in.
	Gina Phillips	7-8	Yeah, I think it is in the sense that I have a choice to, cannot use the word manipulate again, but basically I have a choice to watch or have it do whatever I want it to do, whether I want it to go to live TV, whether I want it to record, save something, um, whether I want it to delete something. I guess I think where it could be more interactive is how you see things where you can talk to the TV or you can do things, um, where a pro, uh, system might control other things in your house or, I mean, I guess I can see where it could go a little higher.

* Participants were asked to rate the DVR on a scale of 1-10 with 10 being fully interactive and 1 being not interactive at all.

Table 4.4: Variety of Use Measures for DVR Users

N	Name	Programming	Functions Used	Guide Use	Search Parameters
1	Brett Hall (age 13)	Malcolm in the Middle Bernie Mac David Letterman Sports Movies		ESPN ESPN 2 Sci Fi Channel	Title
	Brian Hall (age 15)	Cartoons Movies		Cartoon Network Comedy Central MTV	Title Movies
	Richard Hall	The Simpsons Arrested Development Dennis Miller David Letterman Movies	Fast forward Rewind Pause Select from menu Select from guide Search for program Skip commercials Instant replay	AMC Movie channels Sports channels HBO News	Actor Channel
2	Bob Johnson	NCAA Tournament Reality News (Morning)	Fast forward Rewind Pause Select from menu Skip commercials Volume up Program information	Survivor American Idol The Mole Newlyweds CSI	Title
	Beth Johnson	Food Network Movies		Amazing Race	
3	Mark Mitchell	Daily Show Biography Sitcoms Educational Biographies Movies	Fast forward Select from menu Skip commercials	DON'T USE	Title Keyword/Subject Actor

Table 4.4: Variety of Use Measures for DVR Users (Continued)

N	Name	Programming	Functions Used	Guide Use	Search Parameters
4	Joseph Smith	Futurama CSI NCIS Friends Whose Line is it Anyway 700 Club While You Were Out Trading Spaces Teen Titans Georgia football	NOT OBSERVED	NCIS	Title Genre
5	Teresa Jackson	West Wing CSI ER TLC Fox News			
	Henry Jackson	King of the Hill (up) Friends Drew Carey Show ESPN Sports Movies	Fast forward Pause Select from guide Skip commercials Volume up Suggestion list	Bill O'Reilly Hannity and Colmes	Sports Actor Keyword/Subject
6	Debbie Wilson	Sci Fi Channel Cartoon Network Food Network		Learning Channel Discovery Channel Food Network Sci Fi Channel Headline News Comedy Central	Director Actor Keyword/Subject
	Dan Wilson		Fast forward Instant replay Pause Select from menu Select from guide Skip commercials Volume down Suggestion list	DON'T USE	Title Channel

Table 4.4: Variety of Use Measures for DVR Users (Continued)

N	Name	Programming	Functions Used	Guide Use	Search Parameters
7	William Franklin	American Chopper Sports Center Sports	Fast forward Rewind Pause Select from guide Skip commercials Suggestions Cancelled recording	Network Stations History Channel Movie channels	
	Helen Franklin	Spanish television Movies		DON'T USE	Keyword/Subject Action adventure Genre
8	Paula McClure	News Radio Good Day Atlanta Food Network Educational News Science Game Shows		Discovery Channel Science programs	Actor Keyword/Subject
	Evan McClure	Adult Swim History Channel Cartoon Network Fox News	Fast forward Rewind Pause Skip commercials Instant replay	DON'T USE	Actor Keyword/Subject Genre
9	Tyler Martin	Movies News Comedy Mysteries	Fast forward Rewind Pause Select from menu Skip commercials "Save until" option for recorded program	Sci Fi Channel Lehrer Report Brit Hume HBO Starz Action films Mystery	Keyword/Subject

Table 4.4: Variety of Use Measures for DVR Users (Continued)

N	Name	Programming	Functions Used	Guide Use	Search Parameters
10	Jeremy Oliver	Daily Show Buffy the Vampire… Angel Simpsons What not to Wear (wife) Trading Space (wife) TCM IFC Cartoon Network TLC (wife) Movies	Fast forward Rewind Select from menu Select from guide Skip commercials Delete program Instant replay	Cartoon Network	Title
11	Barbara Ellis	Law and Order Crime/Detective	Fast forward Rewind Pause Select from menu Select from guide Skip commercials Volume down	Favorite programs	Keyword/Subject
	David Edwards	Rescue Me South Park Father of the Pride Sports Center		DON'T USE	Sports Keyword/Subject
12	Stacey Hooper	CSI Wiggles (for son) Entertainment Tonight Las Vegas North Shore Prime time News	Fast forward Rewind Pause Select from menu Select from guide Skip commercials Volume down Delete program Edit "Season Pass" (record every episode)	HGTV Food Network E! Channel 2 News	Movies

Table 4.4: Variety of Use Measures for DVR Users (Continued)

N	Name	Programming	Functions Used	Guide Use	Search Parameters
13	Charlotte Ball	North Shore Desperate Housewives Rescue Me Chappelle's Show Inside the Actor's Studio Fox News E! Sitcoms Educational	Fast forward Rewind Pause Select from menu Select from guide Skip commercials	DON'T USE	DON'T USE; DIFFICULTY USING
14	Angela Jones	Friends (all) Oprah South Park Sitcoms News		NA	Sports Title
	Lisa Spencer	Real World (all)		DON'T USE	DON'T USE
	Susan Rose	Seinfeld (all)	Fast forward Select from menu Select from guide Skip commercials	Favorite programs	Titles
15	Shelley Bolton	Desperate Housewives (both) American Dreams (both) Reality Football (both)	Rewind	Oprah	DON'T USE
	Carrie Bowman	The Apprentice (both) News		Read program descriptions	DON'T USE
16	George Grant	News Hour Sitcoms Forensic Reality Dramas	Select from menu Skip commercials Volume up	Non-regular programs Breaking news	Titles Keyword/Subject
	Ellis Lamar	TLC Discover Channel Reality History Disasters		Favorite programs Non-recorded programs News	DON'T USE

Table 4.4: Variety of Use Measures for DVR Users (Continued)

N	Name	Programming	Functions Used	Guide Use	Search Parameters
17	Stephen Bailey	Simpsons South Park Seinfeld Georgia football News	Fast forward Rewind Select from menu Select from guide Skip commercials Delete program	Football	DON'T USE
18	Anthony Williams	Survivor Special Report/Brit Hume Outer Limits Dennis Miller Sopranos Reno 911 Fox News	Fast forward Pause Select from menu Select from guide Skip commercials	Look ahead on a channel History Channel Discovery Channel Documentaries Educational	Keyword/Subject Actor
19	Gina Phillips	Reality Talk shows		Sports	Genre
	Andrew Phillips	Car shows News Sports	Fast forward Rewind Pause Select from menu Skip commercials Volume up/down Change channel while recording	News	Keyword/Subject
20	Alan Davis	Survivor ER Today Show Football	Fast forward Rewind Pause Select from menu Skip commercials	HBO Sports Center	Actor Sports Director
	Phyllis Davis	Will and Grace Amazing Race 60 Minutes		See current programs Today Show	DON'T USE
21	David Gunter	Drama Science Fiction News	Fast forward Pause Select from menu Skip commercials	DON'T USE	Actor Title

Table 4.5: Rate of Use for DVRs

N	Name	Time with Television	Time with DVR
1	Brett Hall (age 13)	1 to 1 ½ hours a day	Don't know
	Brian Hall (age 15)	½ to 1 hour a day	Most of it [TV viewing]
	Richard Hall	2 hours a day 4 hours on weekends 1 hour weeknights	Estimates 80% of time with television
2	Bob Johnson	6-9 p.m. Whenever convenient	Regular basis Estimates 75% of television viewing Yes to whether Tivo is synonymous with television
	Beth Johnson	Mornings Tuesday evening Thursdays	Most of the television viewed
3	Mark Mitchell	10-15 hours a week Depends on week Average 2 hours a day 90% starts around 7 p.m. 30 minutes during day for news More during week than weekends	10 to 15 hours Probably equal [time with TiVo versus regular television]
4	Joseph Smith	15, 20 hours a week Usually at night before bed 9 to 11 p.m. More on weekends than weekday	"Bulk of it" Use TiVo everyday
5	Teresa Jackson	1 hour during prime time	
	Henry Jackson	4 hours a day Less on weekends	4 hours (1 ½ hours upstairs, 2 ½ hours in living room)
6	Debbie Wilson	2 hours on weeknights 8 hours a day on weekends	Estimates 95% is DVR Not much different weekend versus weekday Watch football live
	Dan Wilson	2 hours on weeknights 20 hours a week	Almost all DVR Estimates 90% is DVR, some live TV
7	William Franklin	Couple of hours a day When traveling 10-11 or 11:30 p.m. When home, 8-10 p.m.	"the whole time I'm watching television"
	Helen Franklin	1 ½ hours a day Monday-Friday, 8:30 until 10 or 10:45	"…during the entire time, I guess"
8	Paula McClure	7-8 hours a week, 1 hour a day	

Table 4.5: Rate of Use for DVRs (Continued)

N	Name	Time with Television	Time with DVR
	Evan McClure	Twice that (Paula's time) Watch during lunch	"…They really aren't…separate anymore…even if we're watching live TV, you always have that pause capability…"
9	Tyler Martin	TV on all the time when working at home When telecommuting, don't watch 7-11 p.m. when coming home from work	On weekends to catch up on shows
10	Jeremy Oliver	1-2 hours a night After dinner	Daily Show is always recorded Start watching program late in order to skip ads
11	Barbara Ellis	Varies Some weeks watch a lot, some not at all More during Olympics Not on Saturday except sports	"…If we've got the TV on the TiVo's [in use]" Doesn't perceive much separation between TV and TiVo
	David Edwards	25-30 hours some weeks 10-15 average 2 hours a day No TV on Wednesdays or Fridays A lot on Sundays and Mondays Some on Tuesdays	Even during live TV, uses pause function
12	Stacey Hooper	3 hours a night Weekends when at home More during week than weekends	"I guess I connect it as one and the same, because I'm always using TiVo."
13	Charlotte Ball	2 hours at night Weeknights more than weekends	"It's synonymous"
14	Angela Jones	Couple of hours a day	Don't use it much, mostly watch with roommates
	Lisa Spencer	3 hours a day 4 sometimes Everyday, when get home from class Pretty much same week vs. weekends Sometimes in morning	Uses TiVo
	Susan Rose	8 hours a week, don't know 1-2 hours weeknights All day on weekends, "whenever"	"Every time we're in here [watching TV together in living room]"

Table 4.5: Rate of Use for DVRs (Continued)

N	Name	Time with Television	Time with DVR
15	Shelley Bolton	4 hours a day Sometimes 5-6 hours Depends on when I get home Depends on the day More at night	About 5 hours a week "Most of the stuff we watch live"
	Carrie Bowman	30 minutes in the morning 3 ½ to 4 hours depending on the day Sunday from 8 to 10 p.m. Today show	2 or 3 hours a week
16	George Grant	2 hours a day Depends on my workload Less during the week More on weekends, mid-morning to late afternoon	Estimates 95% of time with television is with TiVo
	Ellis Lamar	1-2 hours a day Sometimes less During lunch, ½ hour if home, not everyday About an hour at night Late evening before bed	Half of all time with TV All of time watching in living room is with TiVo Time watching in bedroom, elsewhere, is not "…The only reason the other 50% is without TiVo is because I'm not here"
17	Stephen Bailey	1 ½ hours, few hours Monday, come home and watch news Tuesdays, Thursdays just at night Weekends depends on whether I'm here	Estimates 50-60% of time with TV is with TiVo, meaning recorded versus live Everyday, just at night
18	Anthony Williams	3-4 hours a day About 6 to 8:30 p.m.	All of time with television is "TiVo - related." "I don't really make a big distinction between them at all."
19	Gina Phillips	2 hours a day Most of the weekend More on weekends during football season 2-3 hours, "it just really depends" Sometimes no TV	Sometimes watch recorded shows live
	Andrew Phillips	About 3 hours 1 hour of news Sometimes let wife watch her shows After wife goes to bed	Seldom watch live TV Even when watching live, uses pause feature Begin watching recorded programs late to skip ads

Table 4.5: Rate of Use for DVRs (Continued)

N	Name	Time with Television	Time with DVR
20	Alan Davis	3 hours a day 4 hours a day Primarily on weekends during football season More during week when not football season	"..Depends on how you define 'use the TiVo'" Even when watching live, uses pause and instant replay features
	Phyllis Davis	90 minutes in the morning About 7 to 8:30 in the morning 2 hours at night TV on 4 hours but doing other things	"All the time that we're with TV"
21	David Gunter	No regular schedule for TV Depends on irregular work schedule	Same amount of time as television

Table 4.6: Competing and Complimentary Activities During DVR Use

N	Names	Complimentary Activities	Competing Activities
1	Richard Hall	None	Went into kitchen briefly
	Brett Hall	None	Went into kitchen briefly
2	Bob Johnson	Eating Drinking Talking to set	Cleaning up kitchen (beginning) Check Internet briefly Interact with pets
	Beth Johnson	Eating Drinking Talking to set	Cleaning up kitchen (beginning) Looking at magazine (< 10 min.) Used restroom Interact with pets
3	Mark Mitchell	Laughing	Turned off cell phone when it rang
4	Joseph Smith	NE	NE
5	Henry Jackson	Drinking soft drink Laughing Talking to set	Check cell phone messages Interact with pets
	Teresa Jackson	Drinking soft drink Laughing	Reading mail Writing checks Writing notes (can't tell) Go upstairs with shopping bag Going through shopping bag
6	Dan Wilson	Drinking (can't tell)	NONE
	Debbie Wilson	Drinking (can't tell)	Let dogs out Interact with pets
7	Bill Franklin	Drinking (can't tell)	
	Helen Franklin		Went to kitchen to get blanket Let dog out Interact with pet
8	Evan McClure	Eating dinner (stroganov) Drinking (water) Talking to set	Cleaning kitchen Cooking Interact with pet
	Paula McClure	Eating dinner (stroganov) Drinking (water)	Cleaning kitchen Cooking Interact with pet Shredding papers Going through mail

Table 4.6: Competing and Complimentary Activities During DVR Use (Continued)

N	Names	Complimentary Activities	Competing Activities
9	Tyler Martin	Drinking (water) Laughing	Typing on computer Hanging picture Laundry Play electric keyboard Walking around room
10	Jeremy Oliver	Drinking (water) Laughing	Reading Newsweek Typing on laptop Going upstairs to get cats Interact with pets
	Cindy Oliver	Laughing	Homework (?) Reading Newsweek Typing on laptop Interact with pets
11	David Edwards	Drinking (water) Laughing Talking to set	Getting water from kitchen Getting mat to lie on floor Used computer in kitchen Interact with pets
	Barbara Ellis	Drinking (water) Laughing	Needlepoint Interact with pets
12	Stacey Hooper	Drinking (water) Laughing Yawning Talking to set	Laundry (briefly) Went into son's bedroom (not a participant) Talking to husband (not a participant) Interact with dog Light candle
13	Charlotte Ball	Drinking (beer) Smoking (when researcher arrived; none after that)	Folding clothes, towels Reading stack of papers Writing notes in organizer Went into den, kitchen Interacting with pets
14	Susan Rose	Eating Popsicle Laughing	Tend to dog Homework Let dogs out Talking on phone (when researcher arrived) Interact with dogs Applying nail polish
	Angela Jones	Eating snack/pickles Laughing	Homework Left to go somewhere Answered phone for 3 minutes

Table 4.6: Competing and Complimentary Activities During DVR Use (Continued)

N	Names	Complimentary Activities	Competing Activities
	Lisa Spencer	Laughing	Homework Restroom
15	Shelley Bolton	Drinking (water) Laughing Talking to set	Made phone call (during ads)
	Carrie Bowman	Eating candy Laughing Talking to set	Made phone call
16	Ellis Lamar	Laughing Talking to set	Made phone call from bedroom (5 min)
	George Grant	Eating yogurt Laughing Talking to set	NONE
17	Steven Bailey	Laughing	NONE
18	Anthony Williams	Drinking (Coca-Cola, water)	Letting cat in Interacting with cat
	Roger Perry	NONE	Interacting with cat
19	Andrew Phillips	Drinking (water)	Going into kitchen (briefly)
	Gina Phillips	Eating popcorn Drinking (water)	Reading book
20	Alan Davis	Drinking (wine) Laughing Talking to set	Starting fire
	Phyllis Davis	Drinking (wine) Laughing Talking to set	Starting fire Reading mail (one piece) Writing on small tablet Interacting with pets
21	David Gunter	Drinking (Diet Coke)	Typing on laptop (few seconds)

Table 4.7: Pausing Activity During DVR Use

N	Name	#	Reason/Length (If Noted)
1	Richard Hall	3	1. Went into kitchen < 1 minute 2 & 3. Paused as part of demonstration of TiVo
2	Bob Johnson	2	1. Wife answered phone & talked 5 minutes 2. Go into backyard between programs, several minutes
3	Mark Mitchell	0	
4	Joseph Smith	NE	NE
5	Henry Jackson	2	1. Leave room 2. Paused one program while watching another channel
6	Dan Wilson	1	When wife let dog out of house
7	Bill Franklin	1	When wife let dog out of house
8	Evan McClure	1	Chores
9	Tyler Martin	1	Left room
10	Jeremy Oliver	0	
11	Barbara Ellis	2	1. David went to kitchen to get snack 2. David answered phone & talked 6 minutes
12	Stacey Hooper	1	Tended to son who was sleeping in his bedroom
13	Charlotte Ball	1	Tended to laundry
14	Susan Rose	0	
15	Shelley Bolton	0	
16	Ellis Lamar	0	
17	Steven Bailey	0	
18	Anthony Williams	1	When researcher arrived
19	Andrew Phillips	1	Paused one channel while watching another
20	Daniel & Phyllis Davis	3	1. When phone rang & talked 7 minutes (Phyllis) 2. To start fire (Daniel) 3. To check caller ID (Daniel; didn't take call)
21	David Gunter	1	Went into dining room to talk to visitor (left w/in 5 minutes and didn't participate in study)
	AVERAGE	1.05	
	AVERAGE	1.5	EXCLUDING NON-PAUSERS

Table 4.8: Attention to the Set for Programming During DVR Use

N	Participant	Segment 1	Segment 2	Segment 3	Average
1	Hall	90.0	96.7	Not recorded[1]	93.4
2	Johnson	94.0	98.3	95.3	95.7
3	Mitchell	98.3	96.7	93.7	96.1
4	Smith	NE[2]	NE[2]	NE[2]	NE[2]
5	Jackson	87.0	99.0	79.0	88.3
6	Wilson	98.0	97.0	99.3	98.0
7	Franklin	87.7	91.3	95.7	91.6
8	McClure	64.7	98.7	92.7	85.4
9	Martin	38.3	14.0	24.3	25.5
10	Oliver	14.7	18.0	65	32.6
11	Edwards	77.0	91.3	99.7	89.3
12	Hooper	83.0	93.0	98.7	91.6
13	Ball	33.0	73.7	63.0	56.6
14	Rose	90.0	90.7	98.3	93.0
15	Bolton	96.3	98.7	98.0	97.7
16	Grant	98.7	87	99	94.9
17	Bailey	99.7	97.3	99.0	98.7
18	Williams	90.0	98.0	99.3	95.8
19	Phillips	94.3	89.7	96.7	93.6
20	Davis	95.7	73.7	88.0	85.8
21	Gunter	98.7	97.0	100.0	98.6
Overall Average					85.1
Average Excluding Participants Martin and Oliver					91.3

Table 4.9: Attention to the Set for Advertising During DVR Use

N	Participant	Segment 1	Segment 2	Segment 3	Average
1	Hall	0	0	0	0
2	Johnson	0	0	0	0
3	Mitchell	0	0	0	0
4	Smith	0	0	0	0
5	Jackson	0	0	0	0
6	Wilson	0	0	0	0
7	Franklin	0	0	0	0
8	McClure	0	0	0	0
9	Martin	0	0	0	0
10	Oliver	0	0	0	0
11	Edwards	0	0	0	0
12	Hooper	0	0	95.4%	31.8%
13	Ball	0	0	0	0
14	Rose	0	0	0	0
15	Bolton	0	68.7%	66.3%	45%
16	Grant	0	0	0	0
17	Bailey	0	0	0	0
18	Williams	0	0	0	0
19	Phillips	0	0	0	0
20	Davis	0	0	0	0
21	Gunter	0	0	0	0
Overall Average					3.84%
Average for Participants Who Watched Ads					38.4%
Average for Segments Where Ads Were Watched					76.8%

Table 4.10: EOS Measures by Type of Activity during Viewing

Description	**Number of Measures**	**EOS Average (in percents)**
Total Measures	59	85.1
Competing Activity	24	71.9
Complimentary Activity	39	84.2
No Competing Activity	33	99.7
No Activity	13	92.3

Table 4.11: Activities During EOS Measures

N	Name	EOS	Activities During Measurement	
			Competing	**Complimentary**
1	Hall	90.0	Conversation non-program	Conversation on program
		96.7	None Coded	None coded
		NA		
2	Johnson	94.0	NOTHING CODED	NOTHING CODED
		98.3	NOTHING CODED	NOTHING CODED
		95.3	NOTHING CODED	NOTHING CODED
3	Mitchell	98.3		Fast-forward program segments Laughing
		96.7		Laughing
		93.7	Turned off cell phone when it rang	Deleted one pgm, selected another
4	Smith	NE	NE	NE
		NE	NE	NE
		NE	NE	NE
5	Jackson	87.0	Check cell phone messages	
		99.0	Conversation non-program	
		79.0	Conversation non-program Interact with dog	Conversation on program
6	Wilson	98.0		Laughing Instant replay Talk to set Conversation on program
		97.0		Conversation on program
		99.3	Brief conversation (one comment)	
7	Franklin	87.7	Conversation non-program	
		91.3	Interact with cat	Rewind Conversation on program
		95.7		
8	McClure	64.7	Conversation non-program	Conversation on program Rewind
		98.7		Conversation on program Talk to set
		92.7		Conversation on program
9	Martin	38.3	Putting pictures in frames	Laughing
		14.0	Hanging picture Left room twice, briefly	Using remote control
		24.3	Hanging picture	

Table 4.11: Activities During EOS Measures (Continued)

N	Name	EOS	Activities During Measurement	
			Competing	**Complimentary**
10	Oliver	14.7	Conversation non-program Interact with cat	Conversation on program
		18.0	Conversation on program Interact with pet bird	Conversation on program Rewinds
		65.0		Conversation on program
11	Edwards	77.0	Left room briefly < 1 minute Conversation non-program	Talk to set
		91.3		Conversation on program
		99.7		Conversation on program
12	Hooper	83.0	Left room Interact with dog	Drinking water Talk to set Conversation on program
		93.0		Volume up
		98.7		Laughing Yawn
13	Ball	33.0	Going through receipts Reading papers Interact with cats	
		73.7		
		63.0		
14	Rose	90.0	Conversation non-program Reading	Laughing Conversation on program
		90.7		
		98.3	Interact with dog	
15	Bolton	96.3	Conversation non-program	Laughing Conversation on program
		98.7		Conversation on program Laughing
		98.0		
16	Grant	98.7		Picked up remote
		87.0	Conversation non-program	Laughing
		99.0		Conversation on program
17	Bailey	99.7		
		97.3		
		99.0		

Table 4.11: Activities During EOS Measures (Continued)

N	Name	EOS	Activities During Measurement	
			Competing	**Complimentary**
18	Williams	90.0	Interact with dog	Drinking water Conversation on program
		98.0		
		99.3		Conversation on program
19	Phillips	94.3		Turned up volume Fast-forward Conversation on program
		89.7		Fast-forward Conversation on program
		96.7		Conversation on program Fast-forward
20	Davis	95.7	Checked caller ID/didn't answer	Conversation on program Laughing Talk to set
		73.7	Opening mail	Rewind Laughing
		88.0		Conversation on program
21	Gunter	98.7		Drinking Diet Coke
		97.0		Drinking Diet Coke
		100.0		Drinking Diet Coke

Table 4.12: Comparison of EOS Measurements from Previous Studies

Media Setting	**With DVR**	**Without DVR**
TV Program	85.1	62.3[a], 60.7[b], 60.0[c]
Advertising	NEGLIGIBLE[d]	32.8[a], 50.0[c]
VCR Movie Rental	NOT MEASURED	81.7[b]

a. Source: Krugman, Cameron, and McKearney White 1995.
b. Source: Krugman and Johnson 1991.
c. Source: Allen 1965.
d. Average EOS for advertising was 3.84. Since only two out of 21 participating households watched advertising, attention to advertising is considered negligible for this study.

Table 4.13: Conversations During DVR Use

N	Any Subject	On Program	Rules	Ask for advice
1	4	6	0	0
2	4	11	0	0
3*	0	0	0	0
4	NE	NE	NE	NE
5	7	7	0	0
6	2	9	0	0
7	5	15	0	0
8	11	14	0	0
9	1	0	0	0
10	9	13	0	0
11	3	11	0	0
12	2	0	0	1
13*	0	0	0	0
14	9	8	0	0
15	5	15	0	0
16	2	11	0	0
17*	0	0	0	0
18	0	6	0	0
19	2	10	0	1
20	4	14	0	0
21*	0	0	0	0
Avg.	4.4	9.4	0	0.13

* Participants observed alone.

Table 4.14: Conversations in Various Television Settings

Media Setting	**Program-Related Conversations**	**Non-Program-Related Conversations**
DVR	9.4	4.4
VCR Movie Rental*	9.9	3.4
Traditional Television*	5.3	5.0

* Source: Krugman and Johnson, 1991.

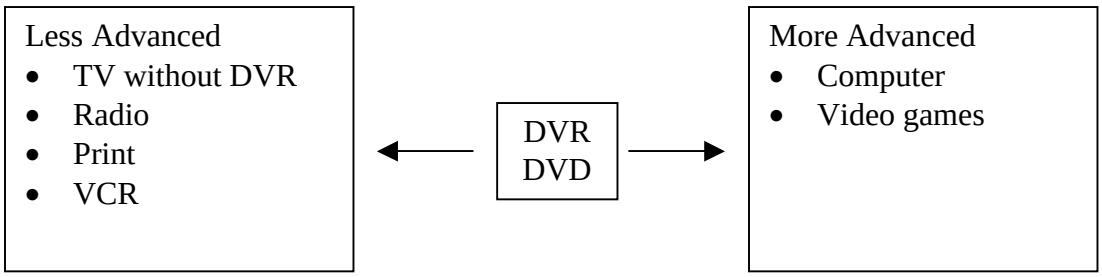

Figure 4.1: Perceived Advancement of DVR in Relation to Other Media Technologies

CHAPTER 5

DISCUSSION

Axial Categories

Based upon the open categories outlined in the results chapter, the researcher reexamined the data to arrive at broader themes in order to collapse the findings into a few larger, simpler categories. This step in the data analysis is called axial coding (Glaser and Strauss 1967). The three main areas of interest outlined in the introduction and literature review served as a guide in identifying three axial categories for the role of DVRs in household media consumption. These three areas are conceptual issues, addressed in research questions 1 through 5; categorizing DVR homes, addressed in research questions 6 through 8; and media consumption, covered in research questions 9 through 13.

For conceptual issues, the researcher identified the category of advancement of television technology. Research Question 1 dealt with what DVR owners think the "digital video recorder" concept means; Research Question 2 addressed how the DVR compares with other media technologies; Research questions 3 and 4 asked what DVR owners think the concepts of interactivity and interactive television mean, respectively. Research Question 5, subsequently, addressed the issue of whether the DVR is perceived to be interactive.

The broader theme for categorizing DVR homes was that of the transformation of television, which was the focus of research questions 6, 7, and 8. Research Question 6 asked if the DVR is continuous or discontinuous in terms of whether or not users have established new media consumption patterns. Research Question 7 sought to understand the use-diffusion orientation of DVRs in terms of how users implement the innovation after adoption. Research Question 8 examined the DVR with respect to owner perceptions of relative advantage, compatibility, observability, trialability, and complexity.

For research questions addressing more specific media consumption issues, the category identified was transformation of the viewer. This category ties together the data collected for research

questions 9 through 13. Research Question 9 addressed the role of the television cluster in DVR homes and Research Question 10 characterized DVR homes in terms of specific media consumption activities such as selectivity, preparation to view, competing and complimentary activities, and attention to the set while viewing. Research questions 11, 12, and 13 covered social aspects of media use. Research Question 11 addressed the social roles of group versus individual viewing, who is the primary user of the DVR, who decides what to watch, and whether rules exist for DVR use. Research Question 12 asked whether there is a DVR expert within the household, and Research Question 13 addressed the issues of internal and external social utility.

Advancement of Television Technology

The first axial category relates to the perception that the DVR is an advancement of television technology, particularly the VCR and traditional television. On the continuum of perceived technological advancement illustrated in Figure 4.1 in the results chapter, the DVR falls somewhere in the middle, more advanced than traditional television, similar in advancement to the DVD player, and not as advanced as computers or video games.

Enhancement of Television Experience. Although the VCR served as the primary conceptual launching pad for describing the DVR, users clearly perceived that the latter represented a significant enhancement of the television viewing experience. First, the DVR was consistently described as easier to use than the VCR, which led owners to feel more likely to use the DVR's recording features than they had with the same functions on the VCR. Many appreciated being able to automatically record every episode of a show with the "season pass" feature instead of repeatedly setting a VCR to tape the same show day in and day out. Second, the DVR was seen as a higher quality product, with some participants describing it as a "smart VCR" or a "VCR that actually works." Participants pointed to the use of digital technology to store audio and video signals on a hard drive as an improvement over magnetic VHS tapes, and the perception of greater simplicity of selecting shows to record by title or category as opposed to punching in dates and times with a VCR remote control. A third perceived enhancement over the VCR was the

ability to manipulate live television through pausing for interruptions and instantly replaying program segments at the viewer's discretion.

Television Becomes More "Computer-Like." The computer was a secondary conceptual anchor in participants' descriptions of the DVR. The DVR was perceived as adding computer-like qualities to television, but was not considered to be as advanced as the computer. In comparing the DVR to the computer, similarities included the use of a hard drive to store information, the storage of information in digital rather than analog format, and the use of a menu-driven interface to select and manage recordings and to manipulate television programming. However, the computer was perceived as being more advanced in terms of the greater number of applications and the perception of the computer as being more interactive. Although most participants thought the DVR was interactive, a sizable number did not.

Transformation of Television

Über-Control. A reexamination of participant data for research questions 6, 7, and 8 led to the development of the axial category of DVR use as transforming television into a more pliable technology to be shaped by the end user into something that suits his or her individual interests and lifestyle. The prominent theme in response to these research questions was a sense of "über-control" on the part of the viewer. "Über" is a German term used to denote "over" or "above" (Merriam-Webster Online Dictionary 2005), and it is also used to mean something that is "extreme" or "extremely good" (Freesearch 2005). In the DVR context, owners perceive a level of control over the television environment above what they had previously experienced, and this level of control represents a significant enhancement of television. Other themes that ran through responses included choice, time efficiency, and convenience.

Control-Based Consumption Patterns. DVR users have established new patterns of television consumption, based on their specific programming interests and scheduled around their life activities, as opposed to making an "appointment" to be in front of the television when the network decides to put something on the air. The selection of narrowly tailored programming at a time determined by the audience member represents a fundamental shift in the use of television in the home. This is consistent with Robertson's (1971) description of a discontinuous innovation.

Expectations of the Media Environment. Some participants had altered their expectations of traditional electronic media in terms of being able to manipulate and control the experience. When asked what they would change about the DVR if they could, responses focused largely on an extension of the capabilities they already had, such as the ability to e-mail programs as a file attachment or the desire for greater storage capacity on the hard drive. These altered expectations extend beyond television to include radio. Some participants expressed the desire for DVR-like controls for radio, and some had found themselves looking for a rewind or pause button on their car radio.

Adapting Television to Individualized Interests. With respect to the use-diffusion model (Shih and Venkatesh 2004), DVR use fell primarily into the specialized use orientation, indicating low variety of use and high rate of use. Shih and Venkatesh (2004) used the dimensions of variety and rate of use to identify four use-diffusion orientations of intense, specialized, non-specialized, and limited use for new products. Specialized use indicates that these DVR owners have been able to identify narrowly tailored forms of content and specific methods for finding and scheduling that content to meet their needs. In addition, DVR users spend almost all of their time with television using the DVR for these individualized purposes. When watching television, viewers control the pace of viewing through pause and instant replay capabilities. Rather than simply accepting or rejecting what is offered on television, the DVR user adapts the technology to serve his or her own purposes.

The DVR is high on perceived relative advantages over prior technology, as already mentioned, and its compatibility with the interests and lifestyles of its adopters. Study participants have busy lives, with work, school, and other activities demanding their time and attention. These individuals appreciated having the ability to select specific programming that is relevant to their interests and to schedule it at a time when they are able to watch. This gives them the freedom to complete other tasks such as homework, hobbies, or exercise, without regard to the television schedule. Content manipulation features give DVR users a higher tolerance for interruptions during program viewing. Instead of getting irritated if the telephone rings during a favorite program, the viewer can pause the television set, take the call, and then return to the program when finished. In homes where the DVR has a dual tuner, household members

have greater flexibility in resolving conflicts over what to watch when two or more individuals have favorite programs coming on at the same time. For these homes, the DVR has taken on the role of what Helen Franklin called a "compromising factor" in that families spend less time arguing over what to watch on television.

In transforming the television environment, DVR use also has the potential to create a divide between users and non-users in terms of knowledge and perceptions of the DVR. Although all participants in the study reported a positive experience with the DVR and found it to be low on complexity, they also admitted to some difficulty in explaining the technology to others who did not have one. Most participants had observed a DVR in use before owning one, but few had had the opportunity to use one for themselves. Many commented that the DVR was much easier to understand when a person used it than from just hearing about it second-hand, similar to learning to use a computer by trial and error as opposed to taking a formal class or reading a book or instruction manual.

Transformation of the Viewer

Extension of Media Decisions to the Household Level. Using a DVR results in a perceived extension of media decision making from the institutional to the household level. While acknowledging limits such as program availability and cable or satellite channel offerings, DVR users perceive that they have greater autonomy over making day-to-day decisions about their television consumption activities. This goes along with a changed perception of the role of television for most participants, especially in terms of a heightened sense of control over television, or über-control, as explained in the previous section on the transformation of television. This feeling of control can be connected to the conception of the DVR adding computer-like malleability to television and that it is an advancement over the VCR and traditional television technology.

Overlapping of Instrumental and Ritualistic Viewing. DVR use blurs the distinction between the traditional concepts of instrumental and ritualistic viewing (Rubin 1984). Instrumental viewing represents a more purposive use of television where the viewer has a specific goal in mind in terms of seeking a specific type of information. Ritualistic viewing is seen as a more habitual, passive use of

television. With the DVR, however, viewers often feel a greater sense of psychological involvement even in habitual viewing through the creation and management of a "season pass" in which the D VR automatically records every episode of a program. In selecting this option, the viewer has several options beyond just the decision to watch a show regularly. He can have the DVR record every episode or eliminate reruns; he could decide to keep every episode recorded or have one automatically deleted as the next is recorded. He can prioritize the programs for which he has a "season pass" so that if two episodes ever conflict, he can select which one would get priority in terms of recording. So in this manner, the DVR adds decision levels even in the case of habitual, or ritualistic, viewing as described by Rubin (1984) in his characterization of media consumption.

Besides the ability to automatically record every episode of a program, the DVR offers the viewer a choice of program selection methods. These include pulling up a list of programs already recorded, scrolling through the program guide, navigating the menu system for locating titles, browsing through different topics and program genres, or entering narrow search terms to find television coverage of specific subjects. Participants in the present study tended to gravitate toward some program selection methods more than others. Some used the program guide and others did not; some used the keyword search feature frequently while others rarely did.

Transformation of Time in the Television Environment. Transformation of the viewer also coincides with an evolving conception of time in electronic media environments. As already noted, the DVR user has greater flexibility over when to watch television and can thus make other activities a higher priority. The traditional notion of structuring the day around television, in this situation, gives way to the idea of structuring media use around other activities such as work, school, exercise, chores, socializing, and hobbies. Participants reported varying patterns in terms of when they watched television. Some watched every weeknight when they came home from work. Some saved their recorded programs to watch on weekends. Others had irregular work or academic schedules and watched television whenever they had some "down time" between tasks. In addition, some have specific activities they engage in before watching television, while others do not. But the common thread in all of these responses was that

the concern about when a program airs had been replaced by the notion of when a program becomes available for viewing, either live at the original airtime, or at a subsequent time more suitable for the viewer.

Another aspect of time that evolves with DVR use is the pacing of viewership. Traditionally, program producers and network program directors made decisions about the lengths of segments, when a commercial break would take place, and whether to show an instant replay. Now the viewer can stop a program at any point and come back at any time, decide to watch a segment a second time, or pause for an interruption.

Transformation of How Television is Consumed. Krugman's (1985) call for analyzing how audiences watch television, not just what they watch, is of increasing relevance in the DVR environment. This study indicates a high level of engagement in television viewing when using a DVR in several respects. First, eyes-on-screen (EOS) measures for watching regular television programs with a DVR averaged around 85 percent overall, which is higher than the EOS average of about 82 percent for VCR movie rental viewing (Krugman and Johnson 1991). Attention to DVR programs in the present study indicates an increase over EOS measures for traditional programming in a non-DVR context, which averaged about 60 percent using similar observation techniques (Allen 1965; Krugman, Cameron, and McKearney White 1995; Krugman and Johnson 1991). Furthermore, EOS averaged about 70 percent when the participant was engaged in other activities while viewing. In other words, participants exhibited relatively high attention to the program even when engaged in competing activities. Conversations during viewing were almost twice as likely to be about the program as about non-program topics.

A second indication of the increasing relevance of how audiences consume media in a DVR environment is the propensity of the viewer to manipulate the content in various ways while viewing. This represents a transformation of the viewer to the decision-making role of program editor. As already noted, most viewers used the DVR's fast forward features to skip advertisements during in-home observations, but they also use this feature to skip unwanted program segments. DVR users sometimes find themselves rearranging the order of programming and extracting the specific content that interests

them, even if it comes at the end of the recording. If a viewer has a favorite actor appearing on *The Late Show with David Letterman*, for example, she might simply fast forward to that segment of the show and discard the rest. This adds another filter to the decision process of what segments make the "final cut" of a program that gets seen by the viewer. The DVR user feels a greater sense of being able to craft a show to his or her liking, as opposed to turning off the television mid-way through a program or waiting through the "boring" segment for the desired portion to appear.

DVR as an "Easy Computer." A final key finding with respect to media consumption in the DVR environment is a high sense of self-efficacy and autonomy in using this technology. Like the computer expert identified by Morrison (1996), DVR households typically consider one person to be more proficient than the others and to be the one the others would turn to if they had a question about using it. However, the DVR expert, unlike the computer expert, is almost a mere figurehead and is rarely consulted. This is because most DVR users, even those who are less proficient in using it, have confidence in their ability to use the device in a way that is compatible with their lives. There is very little rule-making with respect to using the DVR, and no rules associated with "protecting the technology" (Morrison 1996, p. 190) as with other advanced consumer electronic gadgets. This suggests a relaxed, informal, comfortable atmosphere associated with the DVR, with the device being perceived as sort of an "easy computer." Another indication of this heightened sense of self-efficacy with the DVR is the sense of pride in ownership. Many participants said that they have recommended the DVR to others when the topic of television comes up in conversation, indicating a sense of being a "smart consumer" for owning this technology.

From Viewer to Decision-Maker: The Core Category

The researcher examined the three axial categories, advancement of television, transformation of television, and transformation of the viewer, to arrive at the core category that serves as a model for the impact of digital video recorder adoption on household media consumption. The increased sense of control over the television environment experienced by DVR owners, or über-control, is followed by changes in television consumption patterns and in orientations toward electronic media, both at the

household level (Figure 5.1). At a broader, macro level, DVR users perceive an extension of media decisions from the industry to the household level (Figure 5.2). Decisions about what programs will be available at a particular time on a particular network, traditionally determined by content creators, network and station programmers, and cable or satellite services, can now be altered by audience members at the household level when a DVR is present in the home.

Transformation of the DVR Owner

From Viewer to Decision Maker. The viewer in a traditional television environment must choose from programming that is available at a time predetermined by a network, television station, or subscription service provider. As the number of channels and programs increased with the rise of cable and satellite services in the 1980s and 1990s, so did the perceived complexity of looking for programming of interest using traditional grid-based program listings such as *TV Guide*. Many viewers in this environment resorted to channel flipping, or surfing, and then "settled" for the least objectionable program that just happened to be airing at a time when the individual was able to watch. If the viewer had a favorite program that she wished to watch, she had to make a special effort to be in front of the television set when the network programmer decided she should watch it. The VCR provided the option of recording and time-shifting programs, but was perceived as cumbersome for many viewers, in terms of making sure the tape had been rewound, setting the timer, and having to repeat this process indefinitely if the viewer was interested in taping every episode of a television program that came on at a regular time every day or week.

The adoption of a DVR at the household level transforms the owner from a mere viewer of programs to a more engaged household media decision-maker (Figure 5.1). DVR owners perceive that they have gained more autonomy over how they select the programs, what they will watch, and when they will watch a program. With this increased sense of control, television consumption patterns shift toward a more attentive, more engaging experience for the household media decision-maker. Another outcome of having greater perceived control over television is that the DVR owner develops a new orientation toward electronic media overall, which can include raised expectations of both television and radio.

Increased Control over Television. In transforming the DVR owner from viewer to media decision maker, the DVR leads to a greater sense of control over the television environment at the household level (Figure 5.1). The household television environment consists of one or more television clusters (Morrison 1996). Traditionally, programming is made available to the viewer by various networks or stations, and provided by a cable or satellite operator, or by an over-the-air antenna. Programs air on a schedule that is predetermined by the networks, and audiences rely on sources such as word-of-mouth, habit, network or station promotions, and print sources such as *TV Guide* for information about which programs will air at a particular time. Household television consumption is also related to various social roles in the home, including gender roles, parent-child or roommate relationships, individual and group tastes in content, comfort levels with various television-related technologies in the home, and influence from peers and media sources.

The DVR raises the viewer's sense of control over the various aspects of this environment. With respect to programming, the DVR makes it easier for viewers to find programs of interest in an era when television subscription services now provide access to hundreds of channels that offer thousands of programs from which to choose. Most cable or satellite subscribers only watch a fraction of the channels and programs available to them, and participants in the present study felt that the DVR was a useful tool in sorting through the large number of options to find programs and topics of interest to them. Furthermore, the DVR offers a limited ability to alter programming by skipping advertising and undesirable program segments, rewinding live or recorded programs, and instantly replaying program content any time the user desires.

Another aspect of increased viewer control over the household television environment involves the scheduling and timing of television consumption. This occurs in three ways. First, the DVR user can alter when a program airs through time shifting. Second, viewers with a DVR can shorten the overall length of time spent with a program by using the fast forward option. Finally, the rewind, instant replay, and pause features allow the DVR owner to adjust the pace of viewing. The rewind and instant replay

functions, for example let the viewer decide when to watch a particular segment of interest more than once, or review material that was missed or misunderstood.

DVR owners also gain more control over the television environment through a more flexible means of finding and selecting desired programs for live viewing or later recording. Study participants could find favorite programs by searching the DVR's menu system by title. Others had topics of interest, such as cars or food, which they could enter into the DVR keyword search feature in order to find programs on those subjects. Participants could also use the DVR to automatically record every episode of a program, without having to reset the recording each week, or change the recording time due to network scheduling changes.

Shift in Television Consumption Patterns. The greater sense of control over the television environment after DVR adoption results in a shift in media consumption patterns and changed expectations of electronic media (Figure 5.1). Media consumption patterns change in terms of audience behavior while watching a program, the timing of television viewing, and the method of selecting programs. In terms of behavior while viewing a program, DVR owners are highly involved in the programs they choose to watch. They pay greater attention to the television set than viewers in traditional television settings. Attention to regular television programs viewed with a DVR is comparable to the attention given to movie rentals. DVR users engage in only limited competing activities while watching television, and even when they do, they usually exhibit higher attention to the program than viewers in a non-DVR television environment who do not engage in competing activities. Viewers use an average of three or four program manipulation functions such as rewinding or pausing while watching a television program, which also indicates a sense of personal engagement with the content. Conversations with other individuals in the room tend to be on program-related topics more than non-programming subjects.

The amount of time that DVR users spend with television is highly individualized. These individuals are typically not concerned about watching programs at a particular time, because they consume television on their own personalized schedule that fits their unique lifestyle. DVR users can gain a sense of other activities being more important than television, such as socializing, exercising,

performing chores, or completing work. The DVR allows users to watch more content in less time, with varying influence on the length of time spent with television. Overall time with television can increase, decrease, or stay the same after adopting a DVR, but the viewer is able to do more in the same or less time. Finally, as noted above, the DVR's program manipulation features, including pause, rewind, and instant replay, influence the pacing of media consumption.

In terms of the program selection process, viewers gravitate toward the selection method that appeals to them the most. Some DVR owners have a favorite program that they find by browsing or searching by title. Those who want to watch programs on a specific topic can enter a keyword, actor name, or category into a search feature. In using these various selection methods, some participants in the current study commented that they had found programming that they enjoyed but had never heard of before owning a DVR.

Raised Expectations of Electronic Media. In addition to changes in media consumption patterns, the heightened sense of viewer control over television in a DVR environment leads to changes in viewer expectations of electronic media (Figure 5.1). Participants in the present study said that they now experienced discomfort when watching television without a DVR. This is because they perceive that the DVR is a significant advance over traditional television viewing and the VCR. Some had found themselves looking for DVR-type features while using their car radios, because they had become habituated to using those features while using television. This indicates that the expectations that the DVR engenders toward television can "carry over" into different expectations of other electronic media. Finally, there is evidence that DVR owners and non-owners have different orientations toward television. For example, participants in the present study thought the DVR was easy to use, or low on complexity, although some admitted to having difficulty in explaining the DVR concept to other persons outside the home. In addition, visitors to the homes of DVR owners experience varying degrees of difficulty in trying to use the DVR for the first time.

Overlapping Decision Roles

Figure 5.2 illustrates the perceived sharing of media decision roles between the DVR user and media organizations. These individuals sense that they have gained a "seat at the table" when deciding what comes on the air and when it should be scheduled. David Edwards' comment that it is nice not to be "jerked around by the networks" and Joseph Smith's sentiment that giving up his DVR would be tantamount to giving control of his viewing back to station managers exemplify this perception.

The three overlapping circles in Figure 5.2 represent the decision roles of participants in the communication process. The sender, or program producer, director, or editor, has the traditional role of content creation, or encoding. The medium, or network, station, or subscription service, transmits the message across space and time. The receiver is the audience member who traditionally selects and consumes media content at a particular time. The overlap between circles represents shared decision areas between DVR users and media organizations. For example, decisions traditionally made by the program producer, such as the arrangement of content within a program and the determination of what to "edit out" of the final cut, must now pass through one last decision maker when the viewer decides whether or not to fast-forward some segments of a show and "cherry-pick" the portions she wants to see. DVR users who have no problem watching *Late Night with Conan O'Brien* during their lunch break now override network-level decisions about which programs belong in the appropriate day parts.

Feedback in the media decision-making model consists of immediate, real-time viewer decisions as remote control selections are made. When the DVR user chooses any remote control function (pausing or setting up a program to record, for example), this information is automatically available to service providers because the DVR is connected to a telephone line or cable wire. This form of feedback comes to the DVR service provider as media exposure occurs and requires no extra effort on the part of the viewer. The availability of real-time remote control data adds a new measure of viewer response to messages, alongside the traditional measures of intangible psychological response or delayed behavior such as purchasing or voting.

The model that has emerged from the data collected in this study, illustrated in Figure 5.2, represents an *extension*, not a *transfer*, of decisions from the media organization into the household level. This model does not assume an all-powerful audience using the almighty DVR to tame hapless media organizations into submission. Nor does this model assume that audiences are immune to being influenced by the media messages that they are exposed to on the DVR. Furthermore, not all participants in the communication process have the same level of influence in all decision areas. Program producers still make decisions about what elements get included and left out of the content they create, and networks and subscription services still determine which programs are available to record. Using a DVR, however, gives the audience member the ability to amend some of these decisions in order to make television consumption more compatible with other life activities. In other words, the audience in a DVR environment does not replace media organizations in making these decisions, but using a DVR simply extends these decision roles to the household level.

Implications of Shared Media Decision Making

Viewers in DVR homes perceive that they are now full-fledged media decision makers and have changed their consumption strategies and expectations in electronic media environments. The incorporation of computer-like malleability into television has added a greater sense of flexibility and control over content. DVR use also coincides with changing conceptions of time in a mediated environment with respect to the issues of linear versus non-linear viewing, watching things "out of order", scheduling decisions, day parts, and lead-ins. Some of the key implications of the impact of the DVR on household media consumption include a need to rethink prior advertising strategies and parameters, media consumption habits, and traditional versus newer models of the role of the viewer in the mass communication process.

Rethink Advertising Strategies and Parameters

In the DVR environment, almost all participants in the present study skip advertising. They seek out specific content of interest to them at the time that suits them best in order to craft their own individualized program lineup. This tendency to create a personalized television schedule indicates that

traditional media planning concepts such as lead-ins, lead-outs, and day parts may not be as relevant when communicating to DVR owners. The DVR owner who time shifts a program is not going to be present for the show that precedes the one she has selected, and she is not going to "stick around" to watch whatever is "coming up next."

With respect to day parts, the present research and other recent articles indicate some variation in terms of whether a DVR user chooses to time shift a program or to watch it during its originally scheduled time. Participants tend to prefer news and sports programming live, while time shifting fictional programs and reality shows, a finding consistent with recent reports (Holloway 2004). Even more recent is a finding that TiVo owners watch the majority of their summer programming live, while recording more programs during the fall and winter, indicating a possible seasonality to the use of the DVR for recording as opposed to live viewing. (Toto 2005). Media planners must ask whether and how viewers who time shift a program are different from those who do not in terms of demographics, psychographics, and product usage. Further, if the tendency to watch news, sports, and summer programming live continues, advertisers may place new value on these vehicles. Summer has traditionally been a slow period for television, dominated by reruns and lower viewership than during the fall and winter. However, if viewers record programs less often, and presumably skip fewer commercials, then summer becomes a more important time for television advertising because the opportunity for DVR owners to be exposed to advertising messages increases.

The ability of the DVR to track viewer behavior in real time presents opportunities and challenges for gathering and analyzing audience data. Nielsen Media Research, in fact, is currently in the process of developing ways to incorporate DVR usage into its ratings reports (Toto 2005). Because the DVR information is generated instantaneously, less time would lapse between the execution of a message and the availability of viewer responses. DVR user data could be used to compare different messages to determine whether viewers are more likely to skip some and not others. In using the DVR as a tool for audience measurement, however, media organizations will have to address potential privacy concerns on

the part of consumers, in terms of who will have access to the information and whether it will be used in a manner consistent with the interest of the consumer.

Media Consumption

Most owners have established a pattern of specialized use of the DVR. In other words, they use a limited portion of available DVR features to record and manipulate programming of interest (low variety of use), and they use the DVR on a frequent basis (high rate of use). Attention to the television set during the program, which averages 85.1 percent, surpasses attention levels for movie rentals of 81.7 percent (Krugman and Johnson 1991). Attention to advertising is almost non-existent. Use of the DVR's pause feature has established a new category of interruptive behavior, alongside of the traditional notions of competitive and complimentary activities. Competitive and complimentary activities occur at the same time as media consumption. While competitive activities take a viewer's attention away from the set during a program, interruptive behavior forces a distinction between attention to the *television set* and attention to the *program content*. The DVR user can use the pause button to divert her attention away from the set while talking on the telephone, but she can subsequently resume the program without missing any content, and has the option of rewinding in order to watch any content that may have been missed.

DVR users perceive that their experience with television has changed for the better and that the DVR is easy to use. In addition, participants also have a sense of pride in owning this technology, as many study participants have recommended it to others. However, the present findings indicate a gap between owners and non-owners in terms of understanding the DVR environment. DVR owners sometimes have difficulty explaining the device to non-owners in conversations about television outside the home. Visitors to the homes of DVR owners have differing experiences with the DVR depending on their own level of comfort with media technology.

Traditional Communication Models versus New Model of Decision Making

Krugman (1985) has written that, "as consumption patterns change, our existing knowledge of television programming and advertising becomes less relevant…in some instances, newer services call for a different viewer relationship" (p. 24). Rogers (1986) further suggests that, as new, interactive

communication technologies become more commonplace, a more holistic treatment of the communication process is in order. Models of the communication process should recognize participant relationships as overlapping, rather than viewing participants as isolated objects in a one-way, linear process. The model that emerges from the data in the present study, illustrated in Figures 5.1 and 5.2, is consistent with Krugman's (1985) suggestion of a "different viewer relationship" (p. 24) with media after the adoption of new technology and Rogers' (1986) call for a recognition of overlapping participant roles. The model discussed here treats mediated communication in the DVR environment as something to be shaped by all participants, with greater decision-making ability on the part of the audience than is experienced in a non-DVR context.

Traditional models of mass communication involve simplistic viewer decisions: whether or not to watch, turn the television on or off, change the channel or leave it on the current channel, accept or reject what is offered. Programming is found through a grid-based print source with listings by time and channel, word-of-mouth, or promotions. In the traditional context, the viewer makes an "appointment" to watch fixed content that comes on at a fixed time. The viewer structures the day around television and makes comments like, "We have to be home by 8 o'clock so we won't miss *Survivor*."

The decisions present in the traditional model are still present in the DVR environment. For example, many participants in the present study find out about new programs from friends or when they see promotions within a program they are currently watching. What happens in the DVR context is a *multiplication* of the decisions made at the household level and a use of technology to facilitate those decisions. Audience members perceive that they have the option of overriding decisions made by networks, cable operators, advertisers, and program producers. Now the viewer can decide whether to watch a show once or get a "season pass," whether or not to eliminate advertising or stop fast-forwarding if she sees something interesting, whether to skip the "boring" parts of a show, whether to pause if the telephone rings or keep on watching. It no longer matters when something comes on; it matters when the show becomes available. Instead of structuring the day around television, the DVR owner fits television into other, perhaps more important life activities that can include socializing, exercise, work, or chores.

Media decision-makers in a DVR household make comments like, "We can stay as long as we want because we have *Survivor* TiVoed."

Limitations

The present research is an exploratory, qualitative study of DVR users based on a sample of 21 households. This precludes any determination of statistical significance, so future studies using quantitative methods such as surveys and experiments should be developed. The sample for the study was homogeneous in terms of ethnicity, education level, and interest in technology. Given that DVRs are only present in about 10 percent of American households (Buetow 2005), these individuals are part of the so-called innovator and early adopter segments (Rogers 1995), so they are not representative of all television households. As cable and satellite services are increasingly offering DVR technology as part of the television subscription service, and as more households subsequently adopt DVR technology, future research that includes later adopters may reveal different consumption patterns from the ones uncovered in the present study. Traditionally, 30 percent has been seen as a benchmark for a new technology to be seen as "established" in a population. Also, no direct comparison was made between the media experiences and perceptions of DVR users and non-users.

A second limitation is the fact that the data collection procedures were generally conducted in the social part of the household, such as a kitchen table or living room area. This may have influenced interview responses and observed behaviors with respect to the social aspects of DVR and television use, such as whether participants watched television alone or with others, who was present during an observation, and who made decisions about what to watch. Research conducted on more privacy-oriented areas of the home, such as bedrooms or children's playrooms, may uncover different patterns of media consumption behavior.

Finally, the order of data gathering techniques may have influenced results, as participants may behave differently in a study in which the in-home observations are performed before the interview. Interviews were conducted first as a way to establish rapport between the researcher and participants and to reduce the level of discomfort from having a stranger in the home while participants watched

television. However, it is possible that the interviews may have led participants to think the researcher was "expecting" certain behaviors from them in the observations and to adjust their activities according to those perceived expectations.

Future Research

Media Consumption and Decision-Making at the Household Level

Future studies should focus more intensely on media consumption in the home. As evolving technologies impact media consumption and decision-making at the household level, it is more important than ever to dissect how audiences view, and how the DVR and other technologies can help in analyzing this viewing information. Greater emphasis needs to be placed on what is consumed and activities that occur during media consumption. Researchers need to rethink traditional communication concepts such as ritualistic and instrumental media use, notions of time in a mediated environment, and recall and interpretation of what is consumed. For instance, do the boundaries between ritualistic and instrumental media use, as discussed by Rubin (1984), overlap in the DVR home? With a DVR, even programs that are watched on a regular, habitual basis can be "managed" through the DVR menu system and have new decision levels attached them, such as whether to record every episode automatically, whether to skip reruns automatically, when to watch the program, and how to prioritize multiple regularly watched programs on the "season pass" list. These expanded options could add more involving, purposive aspects to habitual viewing behaviors.

Notions of time in a mediated environment that should be further examined in light of DVR use include the scheduling of media use, the length of time spent with media, and the pacing of the consumption process. As repeatedly mentioned in this study, DVR users frequently time shift the programs they watch, which means the viewer now controls the television schedule. As for the length of time spent with media, DVRs equipped with a dual tuner allow viewers to watch two programs simultaneously without missing any content on either one, and all DVRs allow the viewer to skip commercials and other undesired content. Both of these features allow the viewer to watch a greater amount of programming in less time. The use of pausing and rewind features means that the DVR owner

controls the pace of viewing. Instead of watching an entire program from start to finish in one sitting, users can stop watching a program that is only partly finished, then resume watching at a later time, much like placing a bookmark in a novel.

Most DVR models have multiple fast-forward speeds, which could affect the recall and interpretation of images that appear on the screen during a fast-forward. Some models allow the viewer to skip 30 seconds of content at a time. Presumably, DVR users who fast forward at a slower speed would see more of the images in a commercial and retain more information.

Future studies should also include analysis of viewer reactions to the image displayed on the screen during a pause. Participants whose DVRs contain a dual tuner report that they often pause a television show when the commercial begins, switch to a second channel, and resume watching the first channel when the second goes into a commercial break. This means that these participants are presumably exposed to still brand images on the screen for a brief time. What, if any, differences exist in viewer recall and response based on whether the image on the screen during a pause is from a program or an advertisement, or whether the image is of a human, animal, appliance, or nature scene? Do brands gain any advantages in terms of behavior, attitudes, or recall based on whether their brand was seen during a pause, activities that occur during the pause, and the length of the pause?

Advertising Avoidance

If consumers are avoiding ads at an increasing rate, then more research is needed on where and how consumers get brand and product information, such as the importance of word-of-mouth, product placement, and other so-called non-traditional marketing communications forms, and the notion of meeting consumers where they are instead of where the advertiser wishes they were. The effectiveness of these communication forms on behavior, attitudes, and recall of brand information should be evaluated. There also needs to be a reconsideration of traditional media planning parameters, especially the meaning and relevance of time-related parameters such as day parts and lead-ins. Researchers need to consider the opportunities and issues raised for audience measurement in light of the DVR's data collection

capabilities, influences on whether a viewer decides to record a program or watch it live, and the behavioral or cognitive outcomes based on whether a viewer watches a program live or records it.

Decision-Making Roles

Future research should explore the relationships and perceived roles of different participants in the decision-making model of communication in a DVR environment (Figures 5.1 and 5.2). Just as participants in the present study perceived that they had wrested some control over their media usage away from networks and station managers, future studies could compare these perceptions to those of media professionals. For example, do network programming personnel think that DVR owners have more control over their in-home media environments than non-owners do? Why or why not? If yes, then how much more control? What do these media professionals think the implications are for their industry and their job descriptions? The same types of questions can be asked of personnel in other media-related professions.

Decision-Making Roles and Other Emerging Technologies

Another important avenue to explore is whether the model of shared decision-making could apply to other new media contexts. A recent article proclaimed a new era of consumer-generated media that is transforming traditional journalism and marketing, citing such examples as the use of blogs and cellular phone cameras to transmit news (Blackshaw 2005). Whether such a new era exists depends on the perceptions and experiences of consumers and media professionals. If this new era exists, the level of influence by consumers on mediated experiences may vary among different technologies in terms of decision-making roles. Studies could examine the perceived and actual decision roles when consumers use DVRs versus blogs versus cellular phones versus digital music players, and so forth. Just as the DVR extends decisions about television from the institutional to the household level, these and other new media technologies could be analyzed with respect to whether their users perceive a greater sense of control over the media environment. Furthermore, the implications of such a broad extension of media decisions to the consumer level should be studied for different media-related industries, including

advertising, journalism, program production, network and station management, and television, radio, and Internet service providers.

The Household as a Media Decision-Making Unit

The extension of media decision-making to the household level places more scrutiny on social roles of different household members. Media-related organizations such as television networks and advertising agencies have structures in place and assigned roles for decisions about creating, producing, scheduling, and promoting messages. The consumer at the household level is typically on the receiving end of these decisions. With a DVR, however, many decisions made at the media organization level can be amended at the household level.

What is the culture of the household as a media decision-making unit and what are the implications, if at all, for decision makers in media organizations? What hierarchical structure, gender roles, and decision processes exist in different audience segments and how does this relate to media decision-making? In addition, researchers should explore the high sense of self-efficacy and autonomy, and the lack of perceived need for rules, when using the DVR, to determine whether and how these attitudes relate to choices of content, timing, and response to messages. If these attitudes have any relation to how consumers respond to media content, what is the nature of that relationship, and what are its implications for decision processes at the media organization level?

Privacy Concerns

Finally, legal and ethical issues with respect to consumer privacy should be discussed with respect to DVR use. As noted earlier, the DVR is connected to a service provider through a telephone or cable line. This connection allows the DVR service provider to collect real-time data on DVR users' behavior as they enter selections with the remote control. DVR service providers can use this data to build a database on which shows are recorded most often, when viewers instantly replay specific segments of a show, which commercial messages are skipped most often, and which topics a user enters into the search feature. As DVR adoption increases, consumers may become concerned about what types of information is being collected and the extent to which that information is tied back to a specific person. There may

also be concerns about who has access to real-time viewer behavior data and how this information is used. If the information is used to send personalized messages to a household's television set top box, will audience members appreciate the messages because they are narrowly tailored to be relevant, or will they view such communications as an intrusion along the lines of unsolicited commercial e-mail messages, also known as "spam"? Legal and ethical questions should be explored in terms of what information is collected, how it is collected, who has access to the data, what can be done with the data, and the extent to which consumers can object or limit the collection and use of their viewing habits.

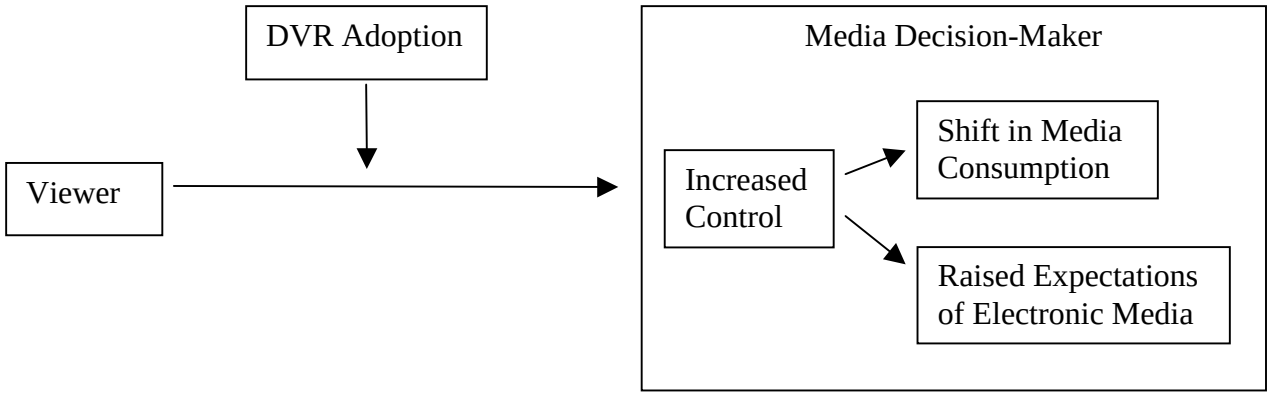

Figure 5.1: Transformation of DVR Owner from Viewer to Media Decision-Maker

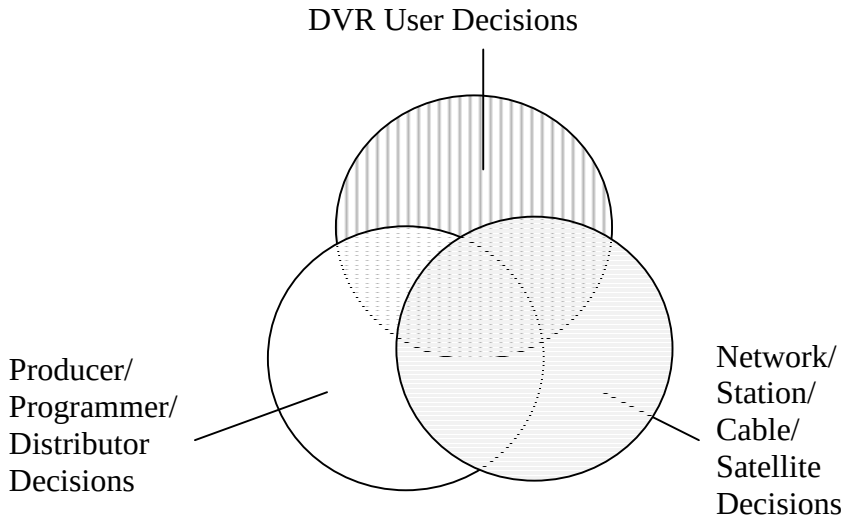

Figure 5.2: DVR User Perception of Media Decision-Making Roles

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APPENDIX A

RECRUITMENT FLYER TEXT

Wanted: Individuals and families to participate in a study on the use of TiVo and other digital video recorders. Pays $80 for two, 1-2 hour sessions. Call Sarah at 369-1467 or e-mail saysmith@uga.edu.

APPENDIX B

SCREENING QUESTIONS

Demographic Information

Name

Address

Social Security Number (for processing of honorarium)

Age

Gender

Occupation

Marital Statue

Children (number, ages, gender)

Household Media Characteristics

Television sets in the home (how many, where in the house, how old, primary users)

Digital video recorders (how many, where in the house, how old, primary users, who purchased, who influenced purchase)

Cable/satellite subscriptions

Premium channels

Pay-per-view (ever ordered)

VCR

DVD Player

Video game console

Magazine subscriptions

Newspaper subscriptions

Radios

Satellite radios

Computers (online service, printer, digital photo printer, video games, CD burner)

Digital camera

Personal digital assistant

Cellular phone (with camera)

APPENDIX C

INTERVIEW GUIDE QUESTIONS

Introductory Questions

1. What do you typically call your DVR when referring to it in conversation? **(RQ1)**
2. How would you describe your DVR to someone who doesn't know what it is? **(RQ1)**

DVR Use and Electronic Media Consumption

Content/Features

1. What do you typically watch using the DVR? **(RQ7a)**
    a. FOLLOW-UP: What else? Weekends? Weeknights? Other times?
    b. FOLLOW-UP: Information/News/Public affairs?
    c. FOLLOW-UP: Entertainment/music/comedy/drama/sports?
2. What DVR/remote control functions do you use the most? Least? Why? **(RQ7a)**
3. If at all, what selections have you made from the program guide? **(RQ7a)**
    a. FOLLOW-UP: Have you selected news from the guide?
    b. FOLLOW-UP: Entertainment?
4. If at all, have you used the keyword search feature? **(RQ7a)**
    a. FOLLOW-UP: What words did you use?
    b. FOLLOW-UP: What programs came up in the search?
    c. FOLLOW-UP: Did you watch any of the shows you found this way?
5. If at all, do you use the selection features for news? If so, is this competitive or complementary to your others sources of news? **(RQ7a)**
    a. FOLLOW-UP: What about for entertainment?
6. If at all, have your viewing choices changed since you got the DVR? **(RQ6; RQ7a)**

a. FOLLOW-UP: If at all, has your news viewing changed since you got the DVR?

b. FOLLOW-UP: Your entertainment viewing?

7. What other sources do you use for **(RQ7a)**

    a. Information—newspaper, magazines, Internet, radio, other activities

    b. Entertainment—newspaper, magazines, Internet, radio, other activities

    c. Are these different since you got the DVR?

8. If at all, have your sources for news changed since you got the DVR? **(RQ6; RQ7a)**

9. What do you usually watch on sets not connected to the DVR? **(RQ7a)**

10. What activities do you typically do when you use the Internet? **(RQ7a)**

11. If at all, has your Internet activity changed since you got the DVR? How? **(RQ6; RQ7a)**

Time Spent with Media

1. How much time do you spend with television? **(RQ7b)** FOLLOW-UP: What days and times do you usually watch television (If not specific on original question)? **(RQ7b)**

2. How much time do you spend with the DVR? **(RQ7b)** FOLLOW-UP: What days and times do you typically use the DVR (if not specific)? **(RQ7b)**

3. If at all, has the amount of time you spend with television changed since you got the DVR? How? **(RQ6a/b; RQ7c)** FOLLOW-UP: If at all, have the days and times you usually watch television changed since you got the DVR? How? **(RQ6a/b; RQ7c)**

4. Does all of your viewing take place on the television connected to the DVR? **(RQ7a, b)**

5. How much time do you spend with

    a. the VCR (IF APPLICABLE)? **(RQ7b)**

    b. the DVD Player (IF APPLICABLE)? **(RQ7b)**

    c. video games (IF APPLICABLE)? **(RQ7b)**

    d. the computer? What days and times do you typically use it? **(RQ7c)**

    e. If at all, has the amount of time you spend with these items changed since you got the DVR? How? **(RQ6; RQ7c)**

f. FOLLOW-UP: Have the days and times you usually use these items changed since you got the DVR? How? **(RQ6; RQ7c)**

6. How much time do you spend with other media activities
    a. Newspaper
    b. Magazines
    c. Radio?
    d. If at all, has the amount of time you spend with these media changed since you got the DVR? If so, how? **(RQ6; RQ7c)**
7. What about non-media activities? **(RQ7c)**

Selectivity

1. How do you typically choose what to watch on television? **(RQ10a)**
2. Do you typically decide what to watch before after you turn on the television? Has this changed since you got the DVR? **(RQ10a)**
3. What about sets not connected to the DVR (IF APPLICABLE)? **(RQ10a)**

Preparation before Media Use

1. Are there any activities that you typically engage in before you begin watching television using the DVR? **(RQ10b)**
2. If at all, have these activities changed since you got the DVR? **(RQ10b)**
3. Are there any activities that you typically engage in before you begin watching television sets not connected to the DVR (IF APPLICABLE)? **(RQ10b)**
4. If at all, have these activities changed since you got the DVR? **(RQ10b)**

Social Aspects of Viewing

Group versus Individual Viewing/Who Decides What to Watch

1. Do you typically use the DVR alone or with others? Who? **(RQ11a)**
2. What about sets not connected to the DVR (IF APPLICABLE)? **(RQ11a)**
3. Who typically chooses what television programs to watch in your home? **(RQ11c)**

4. Does this differ by whether the set is connected to the DVR? **(RQ11c)**
5. Who typically chooses what to record or play back on the DVR? **(RQ11c)**

Rules for Using the DVR

1. Does your home have any rules for using the DVR? What are they? **(RQ11d)**
2. Who sets those rules? **(RQ11d)**
3. Do you feel that there are any unspoken rules for using the DVR? What are they? Who must obey them? **(RQ11d)**
4. Does your home have any rules for sets not connected to the DVR? What are they? **(RQ11d)**

Existence of DVR Expert/Who Uses Television

1. Who are the primary users of the television sets in your household? **(RQ11b)**
2. Who are the primary users of the DVR in your household? **(RQ11b)**
3. What about sets not connected to the DVR? **(RQ11b)**
4. Within your household, who is most proficient at using the DVR? **(RQ12)**
5. Within your household, is there someone to whom others turn to ask for advice on using the DVR?
    a. Who is that person?
    b. Why do they ask this person? **(RQ12)**
6. What types of advice do others ask of this person? **(RQ12)**
7. How often is this person consulted? **(RQ12)**

Perceptions of DVRs and Media

Role of Media

1. What role does television play in your home? **(RQ9a)**
2. What would it mean not to have television in your home? **(RQ9a)**
3. What role does the DVR play in your household? **(RQ9a)**
4. What would it mean not to have the DVR? **(RQ9a)**
5. If at all, has the role that television plays in your household changed since you got the DVR? How? **(RQ9b)**

6. What about television sets not connected to the DVR? Has their role changed, if at all? **(RQ9b)**

Opinions toward Media

1. Let's talk about the purchase of your DVR **(RQ8a-e)**
    a. Why did you purchase? **(RQ8)**
    b. Who in the household initiated the purchase? **(RQ8)**
    c. Who made the purchase? **(RQ8)**
    d. Had you ever seen a DVR in use? **(RQ8c, d)**
    e. Had you ever used a DVR? **(RQ8d)**
    f. What were your expectations when you got the DVR? **(RQ8a, b, e)**
    g. Is it meeting your expectations? Why? Why not? **(RQ8a, b, e)**
2. What is your overall impression of the DVR? **(RQ8a, b, e)**
3. How do you feel about your DVR in terms of ease of use? **(RQ8e)**
4. Is there anything that you would change about your DVR if you could? **(RQ8a, b, e)**
5. Overall satisfaction/dissatisfaction? **(RQ8a, b, e)**
6. What is your impression of television content? **(RQ8)**
7. What is your impression of television as a medium? Likes/dislikes? Why? **(RQ8)**
8. What are your impressions of television content viewed using the DVR? **(RQ8a, b, e)**
9. If at all, has your impression of television as a medium changed since getting the DVR? How? **(RQ8a, b, e)**

Conceptual Issues

1. Prior to this interview, were you familiar with the phrase "digital video recorder"? **(RQ1a)**
    a. What do you think it means? **(RQ1a)**
2. What comes to mind when you hear the word "interactivity"? **(RQ2)**
    a. What do you think interactive means? **(RQ2)**
    b. What comes to mind when you hear the phrase "interactive television"? **(RQ3)**
    c. What does interactive television mean to you? **(RQ3)**

3. Do you think your DVR is interactive in any way? **(RQ4a)**
    a. In what ways is it interactive? **(RQ4b)**
    b. What limits its interactivity? **(RQ4b)**
    c. Rate your DVR on a scale of one to ten, with one being not at all interactive and ten being fully interactive. **(RQ4b)**
4. How would you compare using your DVR to **(RQ5a; RQ5b)**
    a. Other forms of entertainment?
    b. Other sources of information?
    c. Watching television without a DVR?
    d. Using a VCR?
    e. Using a DVD player?
    f. Renting a movie from a video store?
    g. Watching previously purchased programming?
    h. Playing video games?
    i. Using a computer?
    j. The Internet?
    k. Radio?
    l. Print?

<u>Closing Questions about External Social Utility</u>

1. Do persons from outside your household ever watch television with you? Have you ever allowed other people to use the DVR? Who? **(RQ13)**
2. Do you ever discuss your DVR use with others outside your home? **(RQ13)**

APPENDIX D

IN-HOME OBSERVATION CODING ITEMS

Preparation to View (Fill out after observation)

Check any preparations to view that may have occurred before viewing **(RQ10b)**.

1. Get room quiet _____
2. Clean room _____
3. Prepare drinks _____ (Kind of drink: _____)
4. Prepare snacks _____ (Kind of food: _____)
5. Mention of cleaning house/chores _____
6. Turn off or lower lights _____
7. Take phone off hook/turn down phone _____
8. Turn on answering machine _____
9. Make sure everyone is settled down/in room
10. Put kids to bed _____
11. Other _____

    Describe:

    _____

    _____

    _____

    _____

12. Other comments:

    _____

    _____

Start of Viewing

1. Number of people in room at start of program **(RQ11a/b)** _____
    a. Adults _____
    b. Children _____
2. Does anyone hold a remote control? **(RQ11c)**
    a. Y / N
    b. If yes, who holds remote? _____
    c. Does remote change hands? Y/N
    d. From _____ to _____.

Activities during Digital Video Recorder/Television Use

1. Name of program or programs watched **(RQ10a; 11c)**

Program	Who Selected	Any Disagreement

2. Media-related activities during programming **(RQ7a; 11c)**

Activity	Primary Contact	Other	Other
Remote			
Fast-forwarding			
Rewind			
Pause			

Select from programs in menu • What is chosen • Discussion of choice?			
Select from program guide • What is chosen • Discussion?			
Search for program • Parameter (Circle actor (A), title (T), keyword (K), other) • What was chosen • Discussion?	A T K	A T K	A T K
Skip commercials • What skipped (if able to tell) • Discussion?			
Volume up			
Volume down			
Mute			
Other			

Comments

3. Complementary activities **(RQ10c)**

Activity	Primary contact	Other	Other
Eating (what)			
Drinking (what)			
Alcohol			
Tobacco			
Other			

Comments

4. Competing activities **(RQ10c)**

Activity	Primary contact	Other	Other
Household chores • What			
Reading • What • How long			
Writing • What (if able to tell) • How long			
Interact with children (how)			
Hobbies (What)			
Leave room • Where (if able to tell)			

• How long			
Answer phone • What room (if able to tell) • Pause TV-Y/N • How long • Talk while viewing?			
Talking to set			
Other			
Other			
Other			

Comments

5. Conversations **(RQ10c; 13)**

Activity	Primary contact	Other	Other
Conversations-Any subject Circle dot	. . . . .	. . . . .	. . . . .
Conversations on program Circle dot	. . . . .	. . . . .	. . . . .
Discussion of rules **(RQ10c; 11d; 13)**	. . . . .	. . . . .	. . . . .
Asking for advice **(RQ**			

10c; 12; 13) • Who asked • Who was asked • What was asked • Response			

Comments

Eyes-on-Screen Measurement **(RQ10d)**

1. Five minute view time during program

	Segment 1	Segment 2	Segment 3
Program			
Designated time			
Actual time			
Activity: • Zapping • Zipping			

2. Commercial viewing

	Segment 1	Segment 2	Segment 3
Ad (if able to tell)			
Start time			
End time			
E-o-S time			
Activity: • Skipping ads • Leave room			

Follow-Up after Observation

1. Were others in your home using other sets?
    a. Do you know what they may have been watching?
    b. What
2. How would your viewing have been different if I had not been here?