

VCR Survey Meta-Research:
An Application of The Propositional Inventory

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Abstract

Meta-research is an approach to synthesizing research findings over different studies. The propositional inventory is a qualitative application of meta-research. Because no comprehensive study of the existing body of survey-based VCR research has been produced, this new approach to summarizing research findings is applied to existing studies on adult use of VCRs in the United States. Meta-research (in the form of a propositional inventory) provides an objective method for summarizing the results of independent research studies. The data came from VCR research published in academic journals and books.

The analysis produced these conclusions: (1) more probability sampling is needed in future VCR research, (2) previous VCR research was influenced by VCR diffusion rates, (3) prerecorded cassette rental and time-shifting recording are two independent behaviors, (4) more attention is needed on the impact of the length of VCR presence in the household, (5) the VCR may have had minimal impact on television use through 1990, (6) more longitudinal VCR research is needed, and (7) more VCR meta-research is needed on social impacts, including international data.

VCR Survey Meta-Research

This essay serves two functions. First is the attempt to summarize an important body of broadcast research--the first ten years of survey-based studies on the uses and impacts of the videocassette recorder on the television audience. The second is to apply a relatively new approach to synthesizing a body of literature, the propositional inventory approach of meta-research.

Meta-research is a comparatively new approach to analyzing the results of multiple investigations into a research topic. The first book on meta-research was published in 1981 (Glass, McGaw and Smith, 1981). Meta-research was pioneered generally in the field of psychology, and its application began to increase in the 1980s (Hunter and Schmidt, 1990). Meta-research will be getting increasing attention in mass communication research as efforts are made to synthesize existing bodies of literature especially where no systematic reviews are yet available. The specific method of meta-research applicable here and discussed in greater detail below is the propositional inventory (Rogers, 1985).

The VCR diffused into American households faster than any new media technology since television itself (Klopfenstein, 1989), with 1990 Nielsen penetration estimates of 70% of all American households by July 1990 (*Television Digest*, October 15, 1990, p. 17). Urban penetration is higher still, and the number of multiple VCR households is also continuing to rise. Despite this rapid diffusion, no synthesis of VCR research has been published. Although Levy (1989) and Dobrow (1990) are collections of significant contemporary VCR research, neither volume includes an attempt to synthesize what was known about the uses and social impacts of the VCR. Han (1990) has summarized VCR research directions in an historical context.

Several explanations for this lack of synthesis may be offered. First, the VCR's impact on electronic media audiences had limited significance throughout the early 1980s

as its penetration lagged behind that of cable television. Indeed, research into cable television viewing and audience impacts became the focus of more inquiry in the 1980s (e.g., Heeter and Greenberg, 1988) than for research into VCR use. Second, early research on the VCR was conducted when VCR penetrations were low, resulting in the use of non-probability sampling techniques in which establishment of requisite numbers of VCR users took precedence over statistical generalizability. (Randomly sampling cable television subscribers in one market, by contrast, is made quite simple if a subscription list is secured from the local cable operator.) Third, early studies more often tended to be descriptive tallies of VCR use that did not lend themselves well to further inquiry. Fourth, as Rogers (1986) has noted, scholarly communication inquiry historically has tended to focus on the dominant medium of the day; therefore, such inquiry lags behind the initial diffusion of the new medium.

The study of VCR uses and television audience impacts is especially critical to understanding new forms of mediated communication. The VCR typifies new communication technologies with its asynchronous, demassified and interactive aspects (Rogers, 1986). Future developments in digital technologies promise to produce communication transmission and storage equipment that will be the functional equivalent of the VCR. Even as digital compression techniques allow the storage of a feature film on compact disk, future breakthroughs in digital storage may allow diffusion of television sets with storage and retrieval technologies included. To the extent that we focus on understanding the recording and "retrieval" functions of the VCR today, we will be in a better position to understand the coming technologies.

We now have 10 years of VCR research on which to draw. This essay reviews published survey-based research that has investigated general VCR uses and broad audience impacts. The summary of VCR research generally corresponds to the lines of inquiry followed in the studies themselves. These questions include:

- What VCR use surveys have been published, and how were they conducted?
- What have the authors of those studies concluded about VCR use?
- What households (demographically) adopted VCR technology?
- What were the patterns of recording, playback of recordings, use of prerecorded tapes, and commercial avoidance via VCR use?
- How does VCR use affect the ways in which people use television?
- What changes appear in the VCR studies over the course of the 1980s?
- What were the limitations of these studies, and what do they imply about the need for future investigations?

Method

To summarize the existing set of survey-based VCR research, we followed the example set by Dutton, Rogers, and Jun (1988) in their summary of personal computer survey research.¹ The concentration on survey-based VCR research was justified by three factors:

1. the focus on the uses and audience impacts of the VCR;
2. the need to include methodologically comparable VCR studies; and
3. the established history of survey-based VCR research discovered through a review of the literature.

Because this investigation is centered on "VCR use" as the unit of analysis, we also did not include those studies which concentrated on other social-oriented dependent variables. Thus, these VCR studies were not included in our analysis: Dobrow's (1989; 1990) ethnographic research on ethnic uses of prerecorded video; Shatzer and Lindlof's (1989; Lindlof and Shatzer, 1990) Q-sort of 14 VCR families; Roe's (1987; 1989) research on Swedish adolescent video use; Kim, Baran and Massey's (1988) investigation of familial control of television in selected VCR households; Morgan, Alexander, Shanahan, and Harris's (1990) investigation of the relationship between VCR and family conflicts; and Levy and Gunter's (1988) review of British VCR use. Future meta-research on these related studies of the impact of the VCR on variables other than audience behavior would be welcomed.

This investigation into VCR research was analogous to Dutton et al.'s (1988) study of personal computers in several ways. Both were relatively new communication technologies that had only recently come under the scrutiny of researchers, and so had been in early stages of inquiry. Both had diffused into U.S. households for similar periods of time (approximately 10 years).² Both were the subject of academic and commercial research inquiries. The biggest difference between the two subject technologies was in diffusion rates: The VCR had diffused more rapidly and widely into U.S. homes than the personal computer. The lag time between data collection/analysis and publication of results, however, means that even recently published VCR research was based upon samples taken when VCR penetration was more limited.

Rogers (1985) distinguished two types of meta-research: meta-analysis and propositional inventories. Although meta-analysis entails the statistical analysis of previous

quantitative research, propositional inventories "utilize more qualitative approaches to the synthesis of research findings, yielding a set of verbal conclusions in the form of a propositional inventory" (Dutton et al., 1988, p. 222). The propositional inventories approach is most useful in the early stages of a field of inquiry, when number and comparability of primary research findings are low, and access to data for secondary statistical analyses is limited (Rogers, 1985). These descriptors apply to published VCR research, especially because the original data collection normally took place well before publication. More important, we chose the propositional inventory approach to meta-research not because a limited number of studies exist, but because so few used random samples. Lack of uniformity in sampling techniques and changing populations of VCR users make the direct statistical comparisons necessary for meta-analysis virtually impossible in this case.

The first step in meta-research is to set the boundaries for studies to be analyzed (Rogers, 1985). We limited this initial analysis to the following:

1. surveys of adult U.S. VCR users;
2. published research (primarily journal articles and book chapters); and
3. nonproprietary research.

The first step was taken to control for likely cross-cultural differences in findings and to filter out studies that reported exclusively on VCR use by children or adolescents. This focus on one large, but specific segment of VCR users allowed more direct comparison of reported findings.

Concerning the second limitation, we presumed published research to be more significant to the field, more refined than unpublished research, and more easily diffused to

scholars in the field.³ We further restricted the kind of published research to journal articles or book chapters, most of which had passed some measure of peer review (Miletic, 1988, was one exception). Other than unpublished conference papers, the only clear exclusion was proprietary commercial VCR research, because of its limited accessibility and questions about the objectivity of commercially-sponsored research (see Klopfenstein, 1990).⁴

An exhaustive literature search was completed by consulting Communication Abstracts, the Educational Resources Information Center (ERIC) database, and the bibliographies of VCR papers. All applicable published U.S. VCR research available or cited through the summer of 1990 was included through this process. In all, we identified 20 studies that fit the criteria of survey-based research of adult VCR users in the U.S. Although several citations were based upon a single data set (i.e., Levy 1980a, 1980b, 1981; Levy 1983, Levy and Fink 1984), we included all references because different analyses were completed on the data.

Summary of Findings

The articles were read critically with findings reported in our corresponding word tables. These summaries are our extractions from the original authors' reports.⁵ Where possible, word choice reflects the prose written by the original author(s). The studies are summarized in Table 1. The survey method, sample characteristics, response rate, and year of data collection are given when reported. Sample size and the reported VCR penetration at the time of the study are also listed. Although not all of the studies included demographic findings, a separate column is devoted to such information in order to include descriptive data. Finally, a summary statement of the findings is given. The general

findings reflect the opinions of the original author(s) as reported normally in the concluding section of the study. This text reflects what those author(s) determined to be the key results and implications of the data.

Insert Table 1 about here

Survey Methods

The methodologies of the 20 VCR studies reflected common survey-based approaches: diaries (8), telephone (6), written questionnaires (2), mail questionnaires (2), and electronic meters (2). Only commercial sources (Nielsen and AGB) provided nonproprietary data from electronic meters (Miletic, 1988 and Sims, 1989). The earliest VCR studies were diary-based with 60% response rates, higher than the 45-50% rate normally expected for diaries (Beville, 1988). Telephone response rates were closer to expected values. Academic researchers used written questionnaires and telephone surveys when primary data were collected and analyzed.

VCR sample sizes varied widely with early studies being purposive by necessity, although the first 6 citations were all based upon very large overall samples, of which the VCR subset was around 250 respondents (Agostino & Zenaty, 1980; Levy, 1980a, 1980b, 1981, 1983; and Levy and Fink, 1984). Murray and White (1987) was the first primary, noncommercial study to report a survey based upon a true probability sample, albeit in a small market. Only commercially-sponsored VCR research (e.g., Kaplan, 1985; Metzger, 1986; Miletic, 1988; Lindstrom, 1989; and Sims, 1989) involved the use of national samples. One cited study (Potter, Forrest, Sapolsky & Ware, 1988) drew its sample from a

video store membership list. Even though we focused on survey-based VCR research, this process resulted in a varied collection of studies.

Year of publication did not coincide with year of data collection. Murray and White (1987), for example, reported data that was collected in the fall of 1985 with VCR penetration reported to be 29%. Henke and Donohue (1989) studied VCR users in one community when penetration was only 20%, which means that they probably collected their data before Murray and White (1987). Because most studies cited in our manuscript involved a "snapshot" of the expanding VCR universe, resulting sample proportions of early and recent adopters differed depending on the point when the data were collected.

Demographics

In our review, we were surprised to discover that few of the cited studies investigated or even reported demographic characteristics of the VCR households.⁶ Diffusion of innovations research has shown that early adopters tend to be of higher socioeconomic status (Rogers 1983; 1986), and this may have been taken as a given by early VCR researchers. VCR prices, in fact, remained quite high through 1983 (Klopfenstein, 1989) meaning that few moderate and lower income households might be expected to have purchased them.⁷

More recent research reported that VCR households were larger than non-VCR households, a finding explained by the correlation of presence of children in the household with VCR presence. (More evidence of this may be found in the VCR research that focused on the family as the unit of analysis, not included in our analysis.) Consistent with diffusion theory, Lindstrom (1989) reported that, through 1987, VCR households were becoming more like average U.S. households, although they were still headed by more

highly educated males and had greater total household incomes than non-VCR households. Klopfenstein (1990) and Lin (1990) also found VCRs in households socioeconomically above the norm.

The findings concerning demographic characteristics as predictors of VCR use are contradictory. Although Rubin and Bantz (1987; 1989) found specific VCR uses related to demographic variables (e.g., age and gender), Potter et al. (1988) and Henke and Donohue (1989) did not. This could be a function of discrepancies in both survey and sampling techniques.⁸ Lindstrom reported that two-thirds of heavy recorders (21 or more recordings per month) were women.

Author's General Findings

Although difficult to summarize and synthesize, an attempt was made to extract the general findings as proposed by the original study's author(s). One consistent conclusion was that the VCR has not had a significant impact on the total broadcast audience. This conclusion was self-evident in 1980, but was reported as recently as 1989 by Lindstrom. VCR use was considered an extension of existing audience behaviors. No one concluded that the VCR represented a dramatic or revolutionary change in general television audience behaviors.

Earlier studies concentrated on VCR use for time-shifting. Prerecorded cassette rentals became more convenient as the decade progressed, and this was reflected in the attention paid to video rental behavior. VCR use appears to be "active."⁹ The concept of the active audience is particularly suited to devices like the VCR, which viewers use as selection tools in the television viewing process. The form of audience activity most closely associated with the VCR deals with intentionality, i.e., how media consumption is

directed by prior motivation (Blumler, 1979). Rubin and Bantz (1987) found that time-shifting and convenience are two active uses. They also found VCR use to have goal-directed motives, such as library-building and controlling one's programming environment.

At least when VCR penetration was relatively limited (e.g., less than 50% total household penetration), VCR households also appeared to be heavier cable movie consumers. It is not clear if some causal relationship exists here, e.g., a desire for film may predict both VCR adoption and cable subscriptions.

Patterns of VCR Use

Research findings on patterns of VCR use included frequencies of recording behaviors and playback of those recordings, patterns of prerecorded cassette use, commercial avoidance behaviors, and impact on television viewing habits. These results are summarized in Table 2. Specific behaviors are reported to allow comparisons between studies. If the study reported hours (or minutes) of use, those data are reported in the table.

Insert Table 2 about here

VCR Recording/Playback Behaviors

Early reports of VCR recording behavior indicated that at least 77% of recorded fare originated on broadcast television. This may be partially explained not only by lower cable penetration, but also by less widespread availability of cable networks. Thus, a smaller amount of non-network fare made up the pool of potential recordable material.

Between 3 and 4 mean recordings were made by the average household per week, a finding that was reported in both early and more recent studies. Although most recorded programs were played back, the percentage of playback has dropped in more recent research.

The findings showed that time-shifting behavior was apparently different from library-building behavior. Although heavy VCR users may have engaged in both activities, library-builders may not have been interested in time-shifting. A direct relationship between length of VCR presence and frequency of recording behavior seems to exist (Lindstrom, 1989; Klopfenstein, 1990).¹⁰ That is, earlier VCR adopters record more frequently than more recent VCR adopters. At least two explanations are possible here. First, earlier VCR adopters saw the VCR's utility in recording while more recent VCR adopters see the utility in renting videos. Second, it is possible that recording behavior increases over length of VCR presence as adopters learn to record from the perspectives of both technical competence and utility.

Prerecorded Cassette Usage Patterns

The data in Table 2 regarding prerecorded cassette use refers to the use of rented or purchased videos. Prerecorded video use increased dramatically from Agostino and Zenaty's (1980) report of 7.5% of playback time (about one half-hour per week) being devoted to viewing prerecorded tapes. Cassette rental behaviors were not discussed in four of the studies published between 1980 and 1985. Later studies suggested that prerecorded tape use may have become the most important overall use of the VCR for many later adopters (Rubin and Bantz, 1987, 1989; Klopfenstein, 1990). Rubin and Bantz (1987;

1989) and Klopfenstein (1990) reported that cassette rental was perceived to be the primary use of the VCR.

Several studies reported the mean number of tape rentals per month. Harvey and Rothe (1985) found that the largest segment of their sample (22.6%) was renting between 1 and 3 tapes per month. Murray and White (1987) reported an average 5 movies rented each month. Lindstrom (1989) reported an average 2.9 rentals per month. Unfortunately, reporting mean behaviors are not helpful in understanding rental behavior at the individual household level. Reporting other descriptive statistics such as frequency distributions (e.g., Harvey and Rothe, 1985) and sample variances would give more information than simple means. VCR rental usage behavior, for example, is known to be more variable on a day-to-day basis than general television viewing behavior with prerecorded cassette rental behaviors being heaviest around the weekend.

The research contained some apparently contradictory findings. Although Klopfenstein (1990) reported no relationship between length of VCR presence and cassette rental behaviors, Lindstrom (1989) reported an inverse relationship between length of presence and rental frequencies. A more dramatic difference appears to exist between Sims (1989) finding of 3.5 hours per week of prerecorded cassette use and Lindstrom's (1989) report of an average of 2.9 cassette rentals per month. This may be due in large part to the different methods, samples, and even seasonal differences involved in the measurements. These differences also reinforce the difficulties that would be encountered should a numerical meta-analysis be attempted.

Commercial Avoidance Behaviors

Although only one-fourth of the studies were directly concerned with commercial avoidance, we knew from previous qualitative research (e.g., Ferguson, 1990a) that VCR users were inclined to fast-forward through commercials when playing a recorded program. Advertising agencies have met this issue by commissioning proprietary research, some of which has found its way into communication journals.

Summarizing the findings of these published studies, we found at least half of all VCR users reported zipping commercials in time-shifted programs. It is clear that viewers derive satisfaction from this behavior, regardless of length of ownership. There was a shortage of research on the uses and gratifications of zipping in the studies we surveyed.

Impact on Television Viewing

Among the early studies, the most common conclusion about VCRs was that their impact on television viewing was minimal (Levy 1980a; 1980b). The research also reported limited playback rates of time-shifted material (Levy, 1983); that is, not all recorded material is played back. Of the material that is played back, most is replayed soon after it was recorded. Early research characterized the VCR as a complement to regular viewing (Levy, 1981).

Those studies which addressed VCR impacts on television use, however, did detect differences. Agostino & Zenaty (1980) found that their sample of early adopting VCR households used the television set less than non-VCR households. Harvey & Rothe's (1985) respondents said they increased their television use after getting a VCR.

Later studies indicated that VCR owners were watching less television, especially where children were involved. It appears that prerecorded cassette use takes time away

from television viewing. The amount of viewing was not related to the psychographic type of VCR user (Potter et al., 1988).

Discussion

There are inherent limits to these survey-based studies. As happens with any new medium, initial VCR investigations suffered a lack of probability sampling, and this limits interpretation of earlier findings. More VCR studies with probability samples today would still be helpful to allow generalizable findings and theory building. Although we did not review them here, more qualitative, participatory, ethnographic studies are being reported, and these studies are adding to our understanding of the uses and impacts of the VCR.

These studies analyzed here are generally limited to data collected only as recently as 1987 when the national VCR penetration was around 50% and the VCR diffusion rate was at its peak. Because VCR diffusion has slowed with the declining pool of new adopters, general usage patterns now should have stabilized, especially versus earlier studies. A useful contribution today would be a VCR study that would eliminate the effects of the few most recent adopters who are just learning to use their machines, by controlling a possible novelty effect. New VCR households are now being created very slowly, which means the VCR household base has become far more stable than in the years covered by many of the cited studies. It should not be assumed, therefore, that these VCR studies represent current VCR usage behaviors.

VCR research in the 1980s was unique. Because VCR diffusion was accelerating by 1983, VCR users were really a moving target. The importance of this cannot be overlooked. Lindstrom's (1989) finding that recently adopting VCR households by 1987 watched fewer hours of television led him to conclude that the VCR's greatest impact on

the television audience had already passed; future VCR diffusion would be into continually lighter viewing households. His finding may have more to do with the household as the unit of analysis rather than the individual viewer; more recent adopting households are less likely to have children, which means there are fewer people in the household and, thus, fewer total household viewing hours. Yet changes in size of the VCR adopting household is only one example of the changing nature of the VCR audience over the 1980s.

Much VCR use must be viewed in the context of when it was measured in the past decade: the emphasis on early VCR use was more on time-shifting than on playback because fewer prerecorded cassettes were available. Similarly, early VCR time shifting was predominantly from broadcast stations because they were the primary sources of programming. Prerecorded cassette usage, too, can be understood in the context of the availability of cable and broadcast material; households with pay cable do not rent as many cassettes as non-pay cable homes. Children and teens, for example, are heavy VCR users partly because of the plethora of children's videos available on cassette versus the dearth of material available on broadcast television (Wartella et al., 1990¹¹). Because we limited this analysis to studies of U.S. households, how these findings compare with VCR uses and impacts in other countries, where video options are more limited, is not included here. A synthesis of international VCR research would be welcomed.

One apparent conclusion about VCR behaviors may be that rental and recording behaviors are independent of one another. Household recording behavior is reported to be related to the household's television viewing behaviors. As far as we can tell, there have been no published studies of possible correlations between taped programs and the ratings

for the same shows. The research reported here suggests that the most highly rated shows are likely to be the among the most recorded shows as well.

The relationship between length of VCR presence in the household and frequency of recording behavior is intriguing. As already noted, it could be that earlier adopters originally bought their VCRs for time-shifting purposes while more recent adopters acquired their VCRs to playback movies. An alternative explanation is that the longer the VCR is present in the household, the more likely it is that someone "learns" to use the VCR for time-shifting purposes. To the extent that the second is true, it is possible that recording behaviors may increase as time goes on.

These questions, therefore, remain unanswered: Did adopters over the last two or three years (i.e., in the late 1980s) adopt the VCR as primarily a prerecorded video playback device? To the extent that this is the case, will these recent VCR adopters ever learn to use their VCRs to record programs? In other words, will nontapers become tapers? If not, what are the reasons? Are there simply technological barriers, or are nontapers just not interested in time-shifting?

Diffusion theory suggests that later adopters may be less technologically inclined and, therefore, may be less likely to encounter perceived technical obstacles in programming the VCR to record. If the barriers are primarily perceptions of assumed needed technical competence, perhaps new record-assisting technology such as that now being marketed by Gemstar will create a new generation of tapers ("New Free Press," 1990). Understanding the question of technological competence versus possible need gratifications in time shifting will help us move from understanding present uses of VCRs

to future uses of digital video-on-demand services that promise to be the functional equivalents of VCRs.

The VCR apparently has not had a dramatic impact on television or its audiences in the view of the cited authors. Indeed, the growth of cable services, the newfound strength of independent television, and new audience measurement technology may all have had more effect on broadcast television than the VCR has had (Ferguson, 1990b). The increasing diffusion of the video camcorder may also open up entirely new areas of research.

Before this meta-research study was conducted, the authors posed a seemingly simple research question that was expected to be answered: Do patterns of VCR use vary over time? This question was later eliminated when it became clear that (1) by and large, there was a clear lack of longitudinal research on the VCR household; and (2) direct comparisons of the various surveys over time was difficult because of the different units of analysis. This is a critical void in VCR research. If VCR use does change over time, then conclusions reached in past VCR studies may not be completely valid for the VCR environment in the 1990s.

Research conducted from this point forward using representative VCR households will likely include more stable usage patterns. Unlike only a few years ago, the VCR is now a fixture in more than two of three households. Any "novelty" effect, which might have been pronounced in the past, should now be virtually eliminated.

Endnotes

1. To differentiate our opinions from the authors of the cited studies, we signify our own statements via the first person.
2. Dutton et al. (1988) included a section on the diffusion of the personal computer. Because Klopfenstein (1989) similarly addressed the diffusion of the VCR, we have not repeated that information here.
3. Unfortunately, the Educational Resources Information Center (ERIC) announced in late 1990 that it will no longer accept into its database research papers that are not clearly associated with educational research. This will make acquisition and subsequent synthesis of unpublished conference papers much more difficult.
4. A plethora of proprietary VCR studies have been completed by broadcasters, cable operators and program suppliers, advertising agencies, movie studios, and even VCR equipment manufacturers, and could be a valuable addition to this synthesis. Rogers (1983) has commented on the contribution to diffusion research which could be made if such studies were available. Even if the problem of their accessibility were resolved, deciding upon a representative sample of these studies might pose an additional problem.
5. Dutton et al. (1988) contacted "many of the original authors for their review and comment" (p. 223) on their personal computer meta-research. Further revisions of our manuscript would benefit from such input.
6. VCR research has been criticized for a reliance on demographic independent variables, and we expected to find this in the meta-research. Although these studies do not overly rely on demographic variables, the criticism may come from commercially-sponsored VCR research, excerpts of which often appeared in the trade and business press.
7. This assumption is questionable when viewed in light of home satellite dishes which have been adopted by lower income, rural households despite high costs.
8. The use of demographic variables to expose differences in media uses has been the subject of general debate. Collins et al. (1983), for example, use of household demographics to predict cable subscribership. LaRose and Atkin (1988) and Umphrey (1988) found that demographics are relatively weak predictors of cable subscribership, especially as cable (or any other new technology) becomes less of an innovation. Levy (1987) reported no differences in VCR use by respondent sex, age, or education. Rubin (1984) found that although television viewers could be linked to viewing patterns demographically, usage patterns persisted under controls for age and education. As the VCR diffused, demographics became less a predictor of VCR adoption and/or use.

9. We do not mean to instigate a debate about the word "active." Blumler (1979) explained that the concept of an "active audience" has differing connotations: utility (mass communication has uses for people), intentionality (media consumption is directed by prior motivation), selectivity (media behavior reflects prior interests and preferences), and imperviousness to influence. Blumler also stated that different media call for varying levels of activity. Hence, VCRs may change the selective nature of watching television.

10. See also, for example, Klopfenstein, Spears, & Ferguson, 1990.

11. Wartella et al. (1990) concluded that cassettes increase variety of media available for children, while noting that it reflects the kinds of material on television.

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Table 1

Summary of Survey-Based VCR Research Studies

Study Citation	Survey Method, Sample, Response Rate, & Year	Total N, VCR n, VCR Penetration	Demographics	Author's General Findings
Agostino and Zenaty (1980)	Diary (one week) random calls to 50,000 homes 16 major metropolitan areas 55% response rate April-May-June 1979	500 VCR homes located, 250 usable diaries returned (N=250) 1.5% penetration 80% had VCR 18 months or less.	VCR sample HH is larger (has more children, teens, adults 35-54)	83% of VCR adopters had no cable or pay TV; 10% had basic cable versus 19% national average. Most VCR use is time-shifting of broadcast television shows.
Levy (1980a)	Diary (one week) systematic, interval sampling of 28,556 homes in 16 metropolitan areas 60% response rate May-June 1979	418 VCR homes located, 249 usable diaries returned (N=249) 1.5% penetration		Number of broadcast viewers lost to VCR is minute. VCR allows library building and time-shifting of broadcast audience. VCR owners may be among most active audience members. Broadcast audiences are increased by time-shifting of programs which would otherwise be missed, viewing of two similarly scheduled programs, and repeat viewing of programs.
Levy (1980b)	See Levy (1980a)	See Levy (1980a)		Since an earlier Arbitron study found similar recording patterns, playback preferences may be relatively stable and independent of seasonal and programming influences.
Levy (1981)	See Levy (1980a) -->	(247 usable diaries)		VCRs are used as a complement to established patterns of broadcast exposure. Recording behavior indicates audience interest in current broadcast fare.
Levy (1983)	Diary (one week) systematic, interval sampling of 40,000 homes in 15 metropolitan areas response rate not given September 10-October 17, 1981	249 households completed usable diaries		Delayed playback of movies and cultural shows may indicate a motivation to build a home video library. VCR use in general and time-shifting in particular may represent a more complex set of behaviors than earlier studies indicated.

Study Citation	Survey Method, Sample, Response Rate, & Year	Total N, VCR n, VCR Penetration	Demographics	Author's General Findings
Levy and Fink (1984)	See Levy (1983)	See Levy (1983)	More than one-third of the family incomes exceeded \$50,000 and the cable penetration (36%) was double the norm.	VCR users specialize in a small number of program types.
Kaplan (1985)	Nielsen diary-based VCR study March 1983 and July 1984	Sample size not given		VCR zapping takes place <u>between</u> programs.
Harvey and Rothe (1985)	Mail questionnaire Single top-ten ADI case study Fall 1984	N=1400 VCR n=745 (only 1-2 yrs ownership)	Decision to purchase strongly influenced by male member of household	Users with 1-2 years experience: 49% changed their use to fit their convenience. 30% increased time spent with TV.
Metzger (1986)	National telephone survey Random digit dialing: eight attempts 80% response rate Fall 1985	N=6200 VCR n=1350 25% penetration		About one-third used the VCR that day. Under 25% used their VCRs the previous day. Very low incidence of zapping, 6% zipping, 50% flipping to zap.
Rubin and Bantz (1987; 1989)	Written questionnaire purposive sample 1/3 students; 57% male; 43% earned \$40,000+ primarily Minneapolis-St. Paul spring 1985 and winter 1986	424 usable questionnaires	Using VCRs for specific purposes is related to age, gender, and income.	VCR use is active behavior. Time-shifting and convenience are two important VCR uses. Different audience groups use VCRs for different content and purposes. VCR users demonstrate active communication participation as in interpersonal communication.
Murray and White (1987)	Telephone random phone directory +1 rural Illinois college town (20,000 with 45% students) 66% response rate Fall 1985	N=783 households VCR n=227 29% penetration Mean length of presence = 1.7 years.		VCR penetration of households not subscribing to a pay cable service was 2.6%. VCR adopters watched more pay cable movies than non-adopters. VCR adoption and movie consumption appear to be directly related. VCR owners appeared to be heavy movie watchers.
Potter, Forrest, Sapolsky and Ware (1988)	Mail questionnaire systematic sample of members of a large videotape rental club in a S.E. city 38% response rate 1987	N=1100 names VCR n=415	Lack of importance of demographics possibly the result of low variation.	Source shifters versus time shifters: Most users, except low users have positive attitudes about VCRs. Future VCR user segmentation should be technographic, i.e., combining motivations, use patterns and attitudes about a technology, along with lifestyle information.

Study Citation	Survey Method, Sample, Response Rate, & Year	Total N, VCR n, VCR Penetration	Demographics	Author's General Findings
Miletic (1988)	Nielsen metered homes VCR Tracking Report February and July 1985-1988 (average week measuring 24 hours a day)	N was not given. VCR viewing per 24-Hour HUT level: 1985: 13-16% 1986: 24-30% 1987: 41-47% 1988: 56%		While VCR homes account for more of total homes as VCRs diffuse, VCR recording use only accounts for 1 to 3 percent of the total numbers of hours viewed by all homes. VCR playback use has grown similarly from 1 to 5 percent. More playback activity occurred in the July months than in the February periods.
Henke and Donohue (1989)	Telephone, presumably random. Lexington, KY 64.6% response rate Date not given, presumably 1985, judging from VCR penetration	N=485 20% penetration	Displacement of other media and forms of television does occur with VCR acquisition but it is not a function of demographic characteristics (p. 22)	Tapers use the VCR more and view more miniseries, pay cable and sports. Nontapers view more X-rated shows and fewer network shows. Media displacement occurs with VCR acquisition. Having the VCR appears to change one's viewing preferences and habits. Timeshifting results in greater reach for miniseries, network fare, and local news.
Sims (1989)	AGB PeopleMeters Stratified, national sample January and April 1988	N=2000 VCR n=986 53% penetration	Men 18+ were slightly under-represented in the sample. Women 18+ view the most hours of home-recorded material (5.1 hours per week). Children and teenagers view an average 25 minutes per week of pre-recorded tapes (versus 17 hours for women and 13 for men). Playback composition of women not equal to live composition: fewer women 55+ watch playbacks.	7.1 hours of VCR use per week (3.5 on playback). Cable subscription coincides with less playback of prerecorded tapes. Sims argues against ascription, whereby Nielsen assumes that recorded programs are played back.
Rubin and Rubin (1989)	Written Questionnaires Purposive quota sampling undergraduate research class members administered questionnaires 84.8% from Ohio Spring break 1988	N=428 VCR n=299 70% of sample had VCR (purposive sample)	Less education predicted frequency of VCR use. Younger age predicted VCR time shifting.	VCR use represents active audience behavior. VCR use links interpersonal and mass communication. VCR use increases time spent with family and friends. Younger age, restricted mobility, and social interaction predicted VCR use for social utility. External locus of control and less education predicted VCR use.

Study Citation	Survey Method, Sample, Response Rate, & Year	Total N, VCR n, VCR Penetration	Demographics	Author's General Findings
Lindstrom (1989)	Nielsen Station Index diaries 100,000 households 4X per year approx. 40% response rate Through November 1987	60% penetration by July 1988	VCR penetration is higher in higher income HH; 41% male heads of HH college educated 1985, 1987; 43% professional HH head, declining; 1987: 57% of adopters HH income \$35,000+; direct relationship between penetration and market size; VCR HH slightly larger than U.S. average.	VCR penetration is higher among cable HH. Many VCR HH demographic characteristics were unchanged 1982-1987. New VCR owners were less interested in increasing their television exposure. Rental behaviors indicate that use is for entertainment, not information. 3% of viewing audience that records programming is not likely to affect the commercial broadcast system.
Heintz (1990)	Telephone random (See Wartella et al., 1990) parents with at least one child under 12 living at home Champaign-Urbana, IL (100,000) November 1987, February 1988	N=214 VCR HH with children owned ≥ 1 cassette n=144 owned ≥ 10 cassette n=76 73% penetration	VCRs are present in HH with children of all socioeconomic levels. Tape library owners do not differ from non-library owners. No relationship between ethnicity and number of tapes owned/HH. College-educated respondents more likely to object to both toy-related programs and MTV. No relation between parents' education level and size or content of childrens' library.	Families with libraries may be more restrictive with children's TV viewing, or the wider variety of viewing options takes away from overall TV viewing. There is a need to validate survey research with observational or ethnographic methods to understand the complex relationship between media use and other lifestyle processes.
Klopfenstein (1990)	Telephone random phone directory +1 Toledo, OH 65% response rate October 1987	N=1000 adults VCR n=583 58.3% penetration	Length of VCR presence directly related to HH income and presence of children.	Length of VCR presence and various recording behaviors are correlated, but VCR presence is unrelated to reported daily hours of television viewing. No evidence to indicate a "wearout" of VCR usage.
Lin (1990)	Telephone systematic phone directory Midwestern market (200,000) 74% response rate Spring 1987	N=516 adults VCR n=233 53.3% penetration	Average VCR owners were 25-45, college educated, had an income \$33,000 to \$37,000; majority were married with children.	VCR owners were active users rather than passive viewers. Average audience member was often selective in viewing decisions.

Table 2

Patterns of VCR Use

Study Citation	VCR Recording/Playback Behaviors	Prerecorded Cassette Usage Patterns	Commercial Avoidance Behaviors	Impact on Television Viewing
Agostino and Zenaty (1980)	Played back 1 hour/day of recorded material. 68% of recorded public TV material played back within 2 days. 59% of recordings are TV series, 27% are movies. 97% of material recorded originated on broadcast TV.	7.5% of playback time to view prerecorded cassettes (about one half-hour per week).		VCR HH used TV less than national average (323 minutes/day versus 363 national average).
Levy (1980a)	4.1 mean recordings per week; 24.3% of recordings were movies, 14.6% were situation comedies, 11% soap operas. Saturday 11:30 PM top recording hour, Sunday prime time second, weekday prime time third.	39% of viewed tapes were X- or R-rated films, 13.3% comedies. Tapes most often played back during prime time. Weekday prime time and Saturday prime time top viewing times.		Author concludes impact is minimal.
Levy (1980b)	3.39 tapes of previously broadcast programs played back/week. One fourth played no home-recorded tapes back. Network station was the source of 77% of replayed programs, cable 4%. 85% of all home-made recordings were played back completely. No relationship between program type and proportion played back.			Although impact on the television industry is minimal, future increases in VCR penetration and home libraries may contract broadcast audiences.
Levy (1981)	81% recorded ≥ 1 show/week, 74.7% replayed ≥ 1 show/week. Avg. 3.47 home recordings played back/week. 49% of recordings made without simultaneous viewing. Almost 80% of recordings playback within the week, 30% the same day, 29% the next day. Sitcoms and soaps more likely to be replayed during mid-week, entertainment series and "kid-vid" on Sundays. 33% of playbacks 6AM-4:30PM, 28.5% during primetime.	Average .48 prerecorded cassettes viewed/week.		Author concludes VCR use is a complement to, not a replacement for regular viewing patterns.

Study Citation	VCR Recording/Playback Behaviors	Prerecorded Cassette Usage Patterns	Commercial Avoidance Behaviors	Impact on Television Viewing
Levy (1983)	<p>3.31 mean recordings/week, 2.42 playbacks. 52.7% played back during the same diary week. 59.5% of recordings done unattended, 20.2% simultaneous recording. Unattended recordings were more likely to be replayed during the diary period than others. Cable HH less likely than noncable to replay recordings during the diary week especially for broadcast movies and entertainment series. Soaps and dramatic series more likely to be replayed during the diary week than mean, movies and cultural programs less likely.</p>			<p>Cable households are slower to replay recordings possibly due to their greater number and variety of programs from which to choose.</p>
Levy and Fink (1984)	<p>Four factors affect decision to record: content seriality, number of times program is shown, availability of alternatives, and competition from nontelevision activities. 43.5% of all recordings (72% of daily programs) played back either the day of the broadcast or the next day, declining according to an exponential decay model. 50% of all programs are replayed within 3 days. Also see Levy (1983).</p>			<p>Time-shifting use is most associated with daily programs, next most with weekly programs, and least with one-shot programs. Shows recorded for library-building must compete with non-video library materials.</p>
Kaplan (1985)	<p>Only 80% of programs recorded are played back.</p>		<p>Viewers zip past more than half of the commercials when replaying home recordings. Zapping occurs between programs or during the first or last few minutes of a program.. Remote control devices lead to more zapping.</p>	<p>Zapping and zipping is related to the length of non-program segments. There is a need for Nielsen to measure average commercial audience in addition to average program audience.</p>

Study Citation	VCR Recording/Playback Behaviors	Prerecorded Cassette Usage Patterns	Commercial Avoidance Behaviors	Impact on Television Viewing
Harvey and Rothe (1985)	After 12 months, actual use of the VCR to time-shift or to watch one show while recording another did not match the respondent's anticipated VCR use.	45.3% were members of a video-tape club. Of those, 22.6% rented between 1 and 3 tapes per month, 14.1% between 4 and 6 tapes, 5.6% between 7 and 9 tapes, and 4.8% rented 10 or more.		49.1% of sample said they now select the time of day most convenient for them to watch TV. 33.3% of respondents increased their time viewing television as a direct result of owning a VCR.
Metzger (1986)	Fewer than one in four persons in VCR households (about one-third) used their VCR yesterday. 61% of home-recorded usage is watching and 39% is taping. 52% of taping occurs in primetime. 44% of watching occurs in primetime.	45% of VCR material was rented and 4% was owned prerecorded tapes or home movies. The remaining 51% was time-shifted home recordings.	50% of people reported zipping commercials. The frequency was 2.0 zaps per hour. Only 1% reported zapping while taping.	No impact statement given.
Rubin and Bantz (1987; 1989)	VCR use 1.4 hours/day. Time shifting was second most important use followed by library storage.	Movie rental was the most important VCR use.		Television viewing 2.59 hours/day (VCR 1.46/day)
Murray and White (1987)	Avg. 4 recordings made per week.	Avg. 5 movies rented per month.		VCR adopters watched more pay cable movies than non-adopters.
Potter, Forrest, Sapolsky and Ware (1988)	Time shifters viewed tape rental significantly less important than Source shifters, Videophiles, Low users, and Regular users.	Videophiles and Source shifters view more prerecorded tapes (16.8 and 13.3 hours) than Time shifters (5.6), Low users (5.5) or Regular users (9.4).	Time shifters significantly differed ("almost always" or "often") from the other types of users with regard to zipping. Zipping is the most frequently used ad avoidance behavior.	No differences in total TV viewing according to type of users (Videophile, Time shifter, Source shifter, Low user, and Regular user).
Miletic (1988)	Recording has added only 1-3% to the overall HUT levels. Recording and playback were consistently lower in July than on most other months.			Playback time somewhat exceeded recording time, as a percentage of the total distribution of homes using television (HUT).

Study Citation	VCR Recording/Playback Behaviors	Prerecorded Cassette Usage Patterns	Commercial Avoidance Behaviors	Impact on Television Viewing
Henke and Donohue (1989)	78% used their VCRs for recording. Owners who use their VCR for taping differ from those who use the VCR strictly for playback, e.g., tapers use their VCRs more. Canonical correlations show that convenience taping is at odds with library building.	Nontapers view more X-rated tapes.		Tapers view more miniseries, pay cable, and sports. Nontapers decreased regular network viewing more than tapers. Overall, having a VCR changes the owner's viewing preferences and habits.
Sims (1989)	Recording accounted for about 2.3 hours per week, with only 1.1 average hours per week for playback. Both activities were slightly greater in January than in April. Pay-cable homes played back more home-recorded tapes (1.4 hours per week versus 1.1).	In January 1988, 3.5 hours per week, roughly half of total use (7.1 hours) was devoted to playing prerecorded tapes. The respective figures in April were 3.2 and 6.4 hours. Pay-cable homes watched such tapes for fewer hours (4.0 versus 2.9).		VCR owners, especially the children in their homes, have become their own programmers. VCRs have changed traditional television-viewing: a fair proportion of TV use is devoted to playing VCR tapes.
Rubin and Rubin (1989)	VCR use 2.51 hours/day, 2.29 days/week. Library storage is the primary motive for using a VCR at home. Younger age and life dissatisfaction predicted using the VCR for time-shifting.			Television viewing 3.24 hours/day (VCR 2.51 hours/day X 2.29 days/week)
Lindstrom (1989)	Average 10 recordings per month. Earlier adopting HH record more often than recent adopting HH; 66% of heavy recording users are women. Average recording minutes per HH declined 1985-87. Positive relationship between monthly recordings and length of VCR presence.	Avg. 2.9 rentals per month. 90% of VCR HH rented in the previous year. Cassette rental increased through 1987; inverse relationship between length of VCR presence and mean number of rentals per month.		VCR recording in May 1987 made up 2.5% of prime time network audience. Recent adopting VCR HH view fewer hours of TV than earlier adopting HH.

Study Citation	VCR Recording/Playback Behaviors	Prerecorded Cassette Usage Patterns	Commercial Avoidance Behaviors	Impact on Television Viewing
Heintz (1990)	Library owners are more active tapers, and are more likely to use their VCRs for time-shifting and to record programs for library building.	HH with extensive libraries own more types of media than families with limited libraries. Early adopters (pre-1983) tend to have larger tape libraries, but own fewer children's tapes. Though older children have more tapes, younger children spend more time watching videos. Small negative correlation between size of library and parental control of video sources.		Children from HH with a library of tapes watch less television (14.6 hours/week) than children from families with few or no tapes (18.2 hours/week). Parents who limit hours of daily television viewing also limit daily video viewing.
Klopfenstein (1990)	Positive relationship between length of VCR presence and recording behaviors including recording while not at home, sleeping, and watching a different program.	63.5% of all VCR adopters agreed that "renting tapes is the primary reason for having a VCR." No relationship between length of presence and cassette rental behaviors.	No relationship between length of presence and agreement that "avoiding commercials is an important reason to have a VCR."	Respondents from VCR households watch less television than those from non-adopting households, but VCR presence is unrelated to reported daily hours of television viewing.
Lin (1990)	Mean days between recording and playback = 2.4 days, mode = 1 day. While recording, 48% are not watching TV, 28% watching the same channel. 3.2 recordings per week, 2.6 playbacks per week; broadcast networks most recorded (3.6) followed by basic cable (3.3).	47.9% of 100% total VCR time devoted to watching prerecorded cassettes	Commercial zapping appears significantly related to all VCR-use related activities. More satisfied VCR users are also more active zappers. Zippers watched "a lot less TV" than mean.	VCR owners were active users rather than passive viewers. Average audience member was often selective in viewing decisions. VCR users watched 3.2 hours of TV per day.