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INTERACTIVE VIDEO

A Research Report

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Executive Summary

This Working Paper examines the role of "interactivity" in the new and the existing mass media technologies. A central question is the extent to which a viewer wishes to have control over the delivery, format and content of various mass media.

Some analysts have predicted a fundamental historical progression from one-way linear media, such as books, radio and television, to two-way interactive media, such as videodiscs, videogames and home computers. We are skeptical. We believe that new interactive media will ultimately occupy a significant, stable and economically viable portion of leisure/communications behavior in the home. But we predict that linear mass entertainment structures characterized by audience passivity, much like current network television, will continue to dominate audience time.

However, there is a further element to our prediction. At the moment, there is a clear-cut dichotomy between interactive and non-interactive media. Interactive media, such as videogames, do not play by themselves. They require audience participation. We believe that over the next decade audience members will increasingly have a choice. They will be able to follow an ongoing linear structure as a passive spectator or, as the mood strikes them, more actively manipulate, select, and control the flow of communications. The "old" style of interactive media that require constant viewer participation in order to perform properly may ultimately become seen as crude and quaint.

Predictions of this sort are, of course, hazardous. Market demand for videodiscs, videotex, videogames, home computers and the like has proven to be remarkably fickle. The demand for television and the direct ancillary services of cable and VCR seems to be more stable. We think there is an important lesson there.

We will try, in the concluding section, to move beyond the undulating economic fortunes of individual media to assess some of the underlying issues of audience psychology and fundamental parameters of demand for interactivity.

What is Interactivity?

Interactivity is a brand new term invented by technologists. The closest cousins in standard English are interact and interaction. Webster's defines interact as "to act upon one another" and interaction as a "mutual or reciprocal action or influence." Thus, by inference, the term non-interactive denotes a one-way process, wherein one entity acts upon another.

If one applies these definitions to traditional television, mass media, and the emerging communications technologies, three conclusions can be drawn:

- (1) Traditional electronic media including television and radio are non-interactive wherein the media "acts upon the audience member."
- (2) Print media, because they can be skimmed, skipped and re-read, involve the reader and the medium "acting upon one another" in a unique sense.
- (3) Emerging computer-driven video is, for the first time, offering a medium in which the viewer and the medium may achieve "mutual and reciprocal action or influence."

We will examine these distinctions, in greater detail.

Traditional electronic media, by the nature of the technology, delivers programs to a large, anonymous and heterogeneous audience. The pre-programmed package of material is delivered at pre-scheduled and standardized times. Viewer activity is limited to program choice and varying the level of attention to the ongoing program.

In print media, on the other hand, the audience is not passive in the same sense. The reader chooses the time and place of delivery. The medium is continuously interruptable. The reader has complete control of the speed of presentation. Although the medium presents a prepackaged unit of a book, magazine or newspaper, the reader may skip,

skim or reread at will. Many print media are, in fact, designed for partial, non-sequential reading. In this sense, the writer and reader share authorship.

In emerging communications technologies, the issue of viewer control over content, delivery and format is taking on new forms. The appearance of interactive video discs has forced further refinement in the definition of interactivity and has raised significant questions about how audiences can be expected to respond to a television-based medium which requires and encourages increased activity on their part.

Both video disc and video cassette, involve increased interactivity, even when they rely on linear programming, such as movies and concerts. The viewer of a movie on a video disc or video cassette is a more active viewer than one who sees the same movie in a theater or on television, for two reasons: he can choose when and where to see the movie and can exert greater control over delivery by stopping, starting, and repeating sections of the movie as he pleases. With videodiscs in particular, interactivity can be expanded further. As opposed to print and linear playback technologies, the random access laser disc technology more closely fits the dictionary definition of the verb to interact, as "to act upon one another." By selecting which among alternative branches of content to follow, the viewer gains more active control over content and perhaps format. In their simplest form, interactive discs resemble books. The viewer can see or 'read' them in segments (perhaps equivalent to chapters), branching through the program according to individual interests or moods. In this sense the program responds to the viewer's commands and directions, in an alternating sequential format -- first the viewer, then the disc, then the viewer --

and the interaction is built around the viewer's choices and the disc's pre-programmed branches.

Interactive discs for the consumer market feature cooking programs, educational material, cultural and artistic programs, sports and some concert programs which have interactive components. "The Mystery Disc," for example, features clues and full-motion vignettes in a game format as players compete to solve the murder. There are sixteen possible solutions and as a result the game can be played and re-played like a board game. In this case, the viewers radically alter the storyline although they do not know where their choices are leading them. This moves beyond the choosing certain chapters in a book or stories in a magazine or newspaper. Similarly, "The Kid Disc" allows children to use slow motion and stop frame to simulate a target game, to figure out how magic tricks are done, to simulate flying a plane, through the mountains and to stop for frame by frame instructions on construction projects.

Another inherently interactive medium is, of course, the videogame. Using the well-known Pac Man maze-format game as an example, we might describe it as a television narrative with a classic chase theme. There are, however, a nearly infinite number of variations in how the chase might play itself out depending on the movements of the player-controlled Pac Man character to which the other characters respond. Here the viewer has ultimate control over storyline content, albeit within a rather limited narrative structure. The new laser disc-based arcade games extend the graphic resolution of videogames but do not alter the basic dynamic of player-game interaction.

These fundamental definitions are outlined Figure 1. Using this formulation, we define an intermediate level of audience-medium interaction as Level II -- "One Way Active" to describe the special

character of scanable print and electronic media.

Our colleague Professor Andrew Lippman, of MIT's Media Lab, however, expands the definition of interactivity further. He uses the two-person human conversation as the ideal-type model of interactivity. His thesis is that the ability of the computer to process and interpret human speech and body movements will allow the mass media, through computer interfaces, to increasingly respond in a human "conversational" form of interactivity. He identifies five components of interactivity as follows:

- (1) Simultaneity: In conversations, both participants experience simultaneity, or the active processing of information at the same time. In interactive media, simultaneity requires that both the computer and the user actively process information at the same time. The essential factor is that the system must begin to provide output even before the series of user inputs is completed. It acts on incomplete information.
- (2) Interruptibility: In conversations and in fully interactive media, each party must be able to interrupt the progress of the other. There may be no predetermined points at which each party may take actions. Similarly, an interruption must be rapidly acknowledged, even if it is not acted upon correctly.
- (3) Granularity: The segments or entities from which output are generated must be imperceptively small. In conversations, one party who is interrupted will generally finish a word or sentence in which they are engaged but not the entire thought or sequence of sentences. If this were not true, the exchange would resemble a lecture with questions or a press conference rather than a conversation.
- (4) Limited Precomposition: The repertoire from which segments are drawn to build a conversation must be large and not pre-assembled. The individual segments must appear capable of generating a large enough set of different interactions so that the user of a computer system cannot second guess it. In conversations, people generally have a large enough vocabulary so that other people cannot predict what they will say.
- (5) Graceful Degradation: A system should be able to handle unanticipated twists and turns in the conversation. A computer system cannot usefully process any conceivable input, nor can we be sure to comprehend everything that will be said to us. In conversations when we misunderstand and fail to comprehend something, we attempt to achieve an understanding.

In Lippman's definition, true interactivity therefore requires cognitive action on the part of all participants, including the computer. In his view this means that the computer system should maintain a changeable stored state as history and that this state be altered in the course of the interaction.

We can see that interactive media, as defined by Lippman have the following characteristics:

- greater options for the viewer to be active in controlling format, content, and delivery
- less choice for the viewer to be passive in controlling format, content and delivery, particularly content and content as influenced by format decisions

These characteristics by interactive media thus raise two fundamental questions about the viewer: what extent does he wish to be active or passive and what degree of choice does he require with regard to these options. Although detailed research is needed to evaluate these responses, it can be at least hypothetically surmised that if traditional television limited viewer choice by proscribing passivity, highly interactive media can limit viewer choice by proscribing activity and virtually eliminating passivity. In Lippman's definition, the more highly interactive a medium is, and therefore the more it resembles a conversation, the more active the viewer must be to solicit information or messages from it. Although the viewer has greater choice within the boundaries of his active role vis a vis the medium, he must still follow the dictates of the technology in order to use it. In a curious reversal, this characteristic is reminiscent of mass media television in terms of its ability to prescribe behavior.

In media which are less interactive -- or not truly interactive

according to Lippman's definition -- such as 'the mystery disc', the viewer has greater choice over alternating passive and active behavior. Again, delivery is the least affected variable. As noted earlier, the convergence of format and content is important here. It appears that the more interactive a medium or product becomes, the greater role viewer choice over format has in altering content. That is, in highly interactive media (e.g., those computer driven products which achieve the simultaneity of conversations) format becomes increasingly less structured and increasingly more open to viewer choice. To the extent that format is totally alterable, it ceases to be format, per se, and becomes synonymous with content.

In a book, where chapters serve as format, the reader may choose various chapters or paths through the book and ignore others. In a video disc, such as "the mystery disc" where format exists in the disc but is not visible to the user at all points, the inability to follow a visibly predetermined format leads to greater change in content: that is, different endings or conclusions to the game appear each time without the viewer having direct or total control over those outcomes and without being able to preview them or completely anticipate them. With a more highly interactive disc, again in Lippman's definition, one having full simultaneity of processing, format cannot be totally pre-assembled. A continually changing format is one that changes in response to the interaction in progress. While it may retain certain features of formatting, such as questions posed to the viewer regarding how to proceed, essentially it can be treated as content in that it can become the subject of interaction.

Interativity and Choice

Viewer activity, that is continuous control over content, delivery and format is not synonymous with choice. The viewer who adopts a passive role, choosing to exert little control, is not necessarily exhibiting less freedom of choice. The viewer may, in fact, choose to be passive.

The question of choice therefore is central to the introduction of interactive media. With traditional mass media television, the viewer was largely constrained to be passive. With interactive media, particularly with interactive video discs, videotex and videogames, the technology can place viewers in the opposite position: they cannot choose to be passive and still use the medium. We believe it is important to maintain the distribution between activity vs. passivity and choice.

If the criteria themselves are examined, it appears that they lend themselves in varying ways to greater and lesser degrees of viewer choice. In terms of delivery, new media such as video cassette recorders offer the viewer the choice to be active or passive. The viewer can time-shift a program to a more convenient time. The viewer might wish to record a copy for repeated viewing or sharing with others. The viewer might also watch a television program at the scheduled time, while simultaneously recording another for later viewing. Many recorders offer additional capacity to control direction and speed of motion including several forms of visual search fast forward which are akin to skimming text. But the viewer always has the option to view passively, and linearly. In fact, the special character of the VCR is

that its use "blends into" normal television viewing.

Users of Interactive Media

We feel that audience choice about the degree of active or passive use of a medium is crucial in understanding potential acceptance of new media. Passivity constitutes a choice. Required audience activity will be interpreted by some audience members as a lack of choice.

The question that emerges then is -- to what extent do viewers want to be active or passive in relation to media? Given a free choice, with all options available, what will they choose?

This question is not new to audience research and, in fact, three primary schools of thought exist to answer it. Researchers in audience response and media behavior are divided over their positions on which behavior is conditioned by the media itself, what kinds of behavioral changes would result from a different media environment, and to what extent existing media behavior is an accurate reflection of audience needs and preferences. These positions can be classified as follows: Viewer as Inherently Passive; Viewer as Inherently Active; and Viewer as Technologically Conditioned.

Viewer as Inherently Passive:

Years of research on the behavioral affects of television viewing, patterns and audience characteristics have posited the theory of the standard television viewer as passive; that is, that he may be very active in other areas of his life but that he turns to television for escape, social connection, personal reinforcement, and surveillance of important information and prefers to play a passive role while the

television delivers programming which meets those needs. Many advocates of this view maintain that television's primary role as provider of relaxation and escape will not be supplanted by new interactive media and that people will not want to be other than passive in front of the television.

Viewer as Inherently Active:

A smaller group of media analysts believe that the viewer is essentially hungry for a change, tired of being dominated by mass media which have made him feel powerless, and desirous of new interactive media which will allow him greater creativity, autonomy, and control.

Viewer as Technologically Conditioned:

In this view, the technology of mass television has made the viewer passive and the satisfactions or need fulfillments he describes in reaction to television are a reflection of his experience and its limitations. Consequently, interactive media will create more 'active' audiences once audiences have prolonged exposure to them. In this view, the technology will change the viewer; that is, audiences will want interactive home video once they have it and the reason they don't appear to want it now (e.g., the massive popularity of passive TV viewing) is that they don't know what it is.

A full scale analysis of research data relevant to these alternative formulations is outside the purview of this paper. Nonetheless, data drawn from various sources suggest the following conclusions: that the television viewing public will continue to use the

medium passively for the majority of the time; that interactive video will first assume a social role in the home, for group entertainment as an adjunct to traditional television viewing; that specialized uses of interactive video will develop which are geared to one-user and are 'educational as self-help' in nature, but these uses will be limited and will not conflict greatly with prime time television viewing patterns; and that the viewer will develop adaptive skills which enable him to alternate passive and active behavior with regard to the television screen.

Evidence for these conclusions can be drawn from the following data and perspectives:

- (1) Household television viewing extends now to nearly seven hours per day. As several research studies have shown, entrenched media user patterns are not readily supplanted by new media. The increase in programming options through cable, in fact, should serve to maintain or strengthen this pattern.
- (2) Statistics on use of VCRs show overwhelmingly that consumers purchase blank tapes to record TV programming, as opposed to playing pre-recorded programming, heavily use the time-shift capability of the VCR to record programs for later use, and do not save TV recorded cassettes or build substantial libraries of pre-programmed cassettes.

A summary of VCR usage studies conducted by Kalba Bowen Associates, Field Research, Crosby Surveys and Arbitron reveal the continued principal role of television programming in VCR use.

- Kalba-Bowen found that 72% of VCR owners used the machines to tape TV programs they were unable to watch.
- Field found that 75.4% of people's use of the VCR was for time-shifting half or most of the time.
- Crosby found that 82.4% of VCR recording was done while the person was not watching TV or was watching another channel.
- Arbitron found that 73% of people's reasons for buying a VCR was to record while at work, away from home, or asleep or to record one program while viewing another.
- Much of the playback occurs in non-prime time and almost all within one week of the recording.

- Most recordings are viewed only once and the tapes are reused to make other recordings.
- The majority of programs (43% according to Arbitron) recorded are regular TV series, with the recording of movies in second place (Arbitron noted 36% of people used VCRs to record movies).
- There has been little evidence of library-building: Field found that VCR owners had an average of 32 cassettes and that 54% of the owners had fewer than five cassettes with movies recorded on them and 81% had fewer than five with TV programs on them. Nearly 56% had fewer than ten tapes in their libraries. Kalba Bowen found that 17% said they never saved a tape longer than one month and another 62% said they had only done so ten times or less. Arbitron did show that 56% of the people it interviewed wanted to build libraries of movies and specials recorded off TV, but of recordings recently made, only 18.1% intended to keep the recording.
- In the Kalba Bowen study 44% watched TV more than before purchasing a VCR, 41% watched the same amount, and 15% watched less.
- In the Crossley study, 89.8% viewed their playback with family members.
- Arbitron noted that 23.3% of people interviewed were on cable, with 40% of those subscribing to pay-TV and 35.5% of premium-TV subscribers recorded pay-TV programs.

Overall, data on VCR useage strengthens the role of traditional television programming as the primary source of recreation and social life in American households.

- (3) A recent survey on leisure entitled Where Does the Time Go?, released by United Media Enterprises, shows that 72% of 1,000 randomly selected people said they watch television every day or almost every day, spending an average of three hours per person per day, but that they see television as a back drop for other family activities. In other words, other pursuits are carried on simultaneously and six out of ten people polled said they seldom paid close attention to the TV set while it was on. While this study confirms the prevalence of traditional television programming, it raises questions about the viewer as passive. If the viewer is not actually watching the program, but is pursuing other more active leisure time activities simultaneously with the program, it is not clear whether they would ever use television or home video interactively. In fact, of the television serves as a background for other family activities, the association of the

television screen with being only background may still be a strongly entrenched media habit which will be difficult to break. A significant issue here will be media patterns on two-television set households: will one set be used as background and the other for selected interactive uses?

- (4) The emergence of video games, in arcades, and in homes reveals a strong response to interactive entertainment. But the tremendous surges and downswings in this market indicate a very strong sensitivity (elasticity?) to software content. The growth of this market is a clear indication that families are willing to purchase interactive home entertainment, but research has to be done to show how this entertainment is used in relation to standard television viewing, what patterns exist for standalone console use versus use that is dependent upon the television screen, and how the introduction of games affects group and family behavior with regard to television viewing.
- (5) The emergence of the home computer market indicates that the introduction of interactive video discs utilizing computer interface will be met by a small but growing subsegment of consumers who are already using interactive technology for learning, information and special-interest activities in the home. To date, purchasers of home computers have been upscale, professional, well-educated persons, largely men, but from two-income families. It is reasonable to speculate that these households will be making purchasers of interactive video discs which are used for learning, information and special interest activities which are used on a one-person basis and by different family members. If correlations with reading are important, it is interesting to note that in a study conducted by Yankelovich, on reading habits of the American Public, those who read books were more likely than the population as a whole to be young, female, white, well-educated (having at least some college) and in higher income brackets. This statistic was correlated with the fact that time spent watching television does not substitute for time spent reading books although non-readers do watch more TV than readers (24 hours versus 15 hours per week). What is important are that readers do still watch an average of 15 hours per week and, in addition, those who read books were found to be the most involved in a wide range of passive, active, individual, and social activities. This data suggests that upscale homes will become the first market for interactive discs used on a one-person basis, that book readers will tend to use these discs, particularly in homes that have home computers, but that these users will coexist with, rather than supplant traditional television viewing, in patterns similar to reading.

All of the above data, including discussion of video games and home computers, is premised on the existence of an 'interactive' media market

which is not fully interactive. That is, the video games and other products are at the beginning of the two-way interactive hierarchy, but they in no way represent simultaneous 'conversations' in which full simultaneity interruptibility, granularity, limited precomposition and graceful degradation are in operation. The format is largely unalterable, therefore allowing the viewer limited possibilities for altering content. Educational video discs, which rely on branching and sequential formatting of questions and answers, allow for individual pacing and choice of direction, but they allow alteration of content only within the boundaries of the pre-structured disc. Discs which allow the viewer to use them in a linear fashion, without necessarily branching, could be said to allow greater viewer choice, in that they allow passivity, while also allowing the possibilities for greater activity inherent in branching.

Video Game Psychology: What It Tells Us About Interactivity

Research on video games, including motivational attitudes, response to terminal and game design, social implications, and user patterns has been rather limited thus far. The data which is available is consequently a combination of industry analysis, marketing strategies, and opinion expressed by designers and corporate personnel with a vested interest in the promotion of this market.

Nonetheless, for purposes of beginning to identify possible research areas, as they might shed light on how people respond to interactivity, it is worthwhile to examine the perspectives which have developed to date. We will list them separately with brief discussion.

These ideas, perspectives, and statements should serve as a catalogue of directions which might be analyzed more closely in another context:

- (1) "Video games should be easy to learn and hard to master." This opinion was expressed by Nolan Bushnell, one of Atari's original and very successful designers. According to Mr. Bushnell the games must have a low threshold, that is, novices can approach the game easily and derive some satisfaction from the first play. On the other hand, the game should be able to be played on multiple levels, so that experts should walk away feeling that if they play it again they will do better. This again relates to the idea of viewer choice, that users can choose to be more active by playing the game on multiple levels but it does not suggest higher levels of simultaneous processing.
- (2) "Good video games are built on learning schedules, a series of discoveries and strategies that evolve as the player plays and satisfaction is derived from progressing through the learning schedule." This opinion was expressed by Roger Hector, president of Video. According to Brian Johnston, a senior game designer at Fox Video Games, Inc. in San Jose, California the learning process is a subliminal process because patterns are built into the games. In his view the "patterns may not be obvious but you begin to develop a feel for what is going to happen next because there is a pattern that may be complex, but you begin to understand it, to anticipate the movement. It's not totally random; it's learnable, and people delight in that. There are so few places in the world where you can see yourself making progress and learning something new." In this view, learning is equivalent to mastering which is equivalent to satisfaction or pleasure, and, hence, learning to master a video game provides a sense of accomplishment. In this sense, the invisible format begins to be comprehensible as a pattern. If people, in fact, enjoy the fact that the format is not random and therefore learnable, this suggests that total interactivity could be less satisfying, at least for some people. This would suggest that total viewer control over content, format and delivery could become technologically feasible but might remain psychologically undesirable in many situations.
- (3) Learning is accompanied by tension and increasing difficulty. Part of the tension is physically manifested in the game in terms of increasing speed, sound and other effects. The role of this tension in the learning process, in mastery, and in any satisfaction derived from playing the game is not clear. One could speculate that satisfaction comes from the level of mastery which reduces the tension.
- (4) Competition with other people vs. competition with the computer is an important question. According to Ed Rotberg of Video, before 1979 two-player games were popular but have since died out. In

- his view, the possibility of beating a machine is a significant part of the game's appeal and the human dimension is minimal. On the other hand, some new games have been developed which depend upon group playing and upon cooperation, not competition. The "Wizard of War" can be played by two players who cooperate to earn points and "Swords and Serpents" is set up so that the ultimate treasure can only be retrieved if the two players, the knight and the wizard, work together.
- (5) The role of visual effects in attracting people is not clear although designers maintain that they play a significant role.
 - (6) "Different games may represent different symbolic motifs, and, hence, different individuals are attracted to different symbolic constellations, based on their own psychological conflicts." This is the view of Dr. Weingarten in Palo Alto, a psychiatrist who has begun work in this area. Some designers say that they play on prevalent phobias, such as fears of spiders and snakes to develop tension in a game, although some have said that they deliberately play on symbolic motifs, such as the Oedipus complex. This view also correlates with the view that the games release aggression, although two schools of thought exist about this: that the games allow a healthy diffusion of aggression and that the aggression expressed in playing video games will carry over into real life. These arguments are directly related to some of the major questions about the effects of mass media, specifically television, or behavior, particularly the question of whether watching television violence may invite violent acts in the real world.
 - (7) "Demographic useage by specific games has not been well researched." Here the issues of age, education, gender, family income, race and ethnic background, and correlations with other leisure time, media, and educational pursuits will provide insight into how game use relates to other media behaviors. In Japan, for instance, which also has a strong video game culture PacMan was developed as a comic game when players grew bored with space and other games. Then it became very prevalent part of all video game playing. In the United States, the popularity of PacMan among women has led to speculations about differing male/female responses, but little research has been done to show whether this resulted from the game being available outside of arcades (where the clientele is predominantly male and women are far less comfortable) or from differing psychological and social responses to the game itself.
 - (8) "Differing physiological responses to game playing suggest possibly significant age distinctions and may suggest other variables which affect usage." Video games designers claim that they use adolescents to debug programs that adults cannot. It is not clear whether this is an actual physiological difference (faster reflexes, etc.) or whether current adolescents, through increased exposure to electronic media and computers, have developed greater playing skills and confidence than adults who grew up with less exposure to these things. It should also be

noted that video games are thought to increase concentration and eyemotor coordination and are being used in medical therapy for various injuries and diseases. The implications of the age cohort theories are important for the development of interactive media in that if it is true that younger users have more affinity for computers, it can be hypothesized that they will have more activity in interactive media and hence have a greater predisposition to choose it over passive media.

- (9) "Home video games vs. arcade video?" Issues of anonymity, public recognition of accomplishment or failure, social interaction, and individual vs. group use play a role in video game use and potentially in all interactive home video. Again this affects the choice of viewers, active versus passive media under specific circumstances.
- (10) Viewer Control: The Viewer as Co-Designer? "I'd like to see games that would allow the player to create his own environment, his own monster, his own playfield make his own game." This view was expressed by Allan Alcorn, one of Atari's original designers. According to Mr. Alcorn, "it would just take new software." This issue of viewer control, the degree to which the user creates the game, is a crucial one for the study of all interactive video, since it is not clear how many users would want this much control. In fact the converse might be true, that viewers like mastering a preprogrammed learning schedule, and would not want the degree of control that Mr. Alcorn suggests.

Directions for Further Research

Several key questions emerge regarding viewer response to interactivity. Although these questions do not, in themselves, constitute research proposals, they provide direction for future inquiry:

- (1) Do viewers perceive themselves as choosing passive media behavior? For what reasons? With what perceived benefits?
- (2) Under what circumstances and for which reasons would viewers choose media in which they play a more active role? How do they view their ability to choose?
- (3) How do viewers react to full simultaneity and to the other properties of totally interactive media? Do they experience totally interactive video as de facto the inability to choose passive behavior?
- (4) How important is control over delivery, format and content to

viewers and for what reasons?

- (5) To what extent is current television viewing a group process and what family behavior has developed around it?
- (6) In two-television homes will one set remain for broadcast and cable television use and the other become a location for interactive entertainment and for learning and will the division between one and two television households show different behavioral uses of interactive home video?
- (7) Will separate video game consoles have less of an effect on disrupting traditional television viewing than games which depend upon TV monitors?
- (8) How will one person discs be used in family situations? How will group-oriented discs be used and how will each coexist with current family behavior around television viewing?
- (9) What level of interactivity will various demographic group prefer for learning, information, and entertainment?

What emerges from this overview is that viewers wish to have greater choice but that this involves the choice to alternate passive and active behavior and within the realm of activity to have greater possibilities for increased activity. There is no research to indicate that the viewer wishes to give up the choice of passive behavior. In fact, it might be hypothesized that the viewer takes passive behavior in relation to media almost as a given and that the opportunity to engage in more active behavior must be seen as a choice which is exercised with individual discretion.

In this realm, the reasons for choosing active and passive behavior remain key to understanding the potential role of the new interactive media. It may, in fact, be true that active and passive media behaviors are mutually exclusive and non-interchangeable. That is, viewers will choose to be active and to be passive under entirely different circumstances and will not tend to substitute one behavior for another. If this is true, viewers will be concerned with their ability to choose above all and will not react well to new technologies which demand a

uniform level of activity they are not prepared to give.

In this perspective, new interactive technologies will not supplant one-way linear technologies. They will coexist with technologies which allow for or even require passive viewer behavior. Their success as market products will thus be linked to their ability to allow the viewer to choose a more active behavioral posture. This choice can be seen in terms of increasing degrees of activity within a predominantly viewer active medium, or in terms of a choice to be active versus passive. In the field of interactive video discs, increased viewer activity is inherent in increased interactivity, which is largely a technological and design function. Viewers who want increased activity will choose increasingly interactive discs. Those same viewers may also choose less interactive media in certain situations, not because they do not like to be highly active, but because under specific circumstances they prefer more passive behavior. Consequently, an accurate assessment of the users of interactive media would entail an analysis of which groups of users prefer to be active or passive participants under what specific circumstances.