

Divergence Amid
Convergence: The Evolving
Information Environment of
the Home

by Jorge Reina Schement

Do not quote without the permission of the author.
©1994 Columbia Institute for Tele-Information

Columbia Institute for Tele-Information
Graduate School of Business
Columbia University
809 Uris Hall
New York, NY 10027
(212)854-4222

Divergence Amid Convergence: The Evolving Information Environment of the Home

by

Jorge Reina Schement
Dept. of Communication
School of Communication, Information and Library Studies
Rutgers University
4 Huntington St.
New Brunswick, NJ 08903

[908] 932-7919 Work

[908] 932-6916 Fax

E-mail IN%"SCHEMENT@GANDALF.RUTGERS.EDU"

The author wishes to acknowledge Terry Curtis of California State University, Chico, and Milton Mueller of Rutgers University, as well as the members of the critique session of the Annual Review of the Institute for Information Studies and the Aspen Institute for their comments, but especially Linda Henson and Charlie Firestone. Hur-Li Lee and Kathleen Haspel of Rutgers University assisted in preparing the tables.

Suppose that by the twenty-first century every human on earth who has a wrist-mounted communications device can be in contact with any other human via a satellite communications network; that home television has over 100 channels, many of them interactive; that most home appliances are programmable or controllable by our voice; that most mail is sent electronically; that small discs for our home players can hold many thousands of pages of textual information; that an electronic network makes available a university education for anyone willing to pursue it; and that we can join our communities for work, play, education, health care, or inspiration electronically? What then? --Frederick Williams¹

On the Saturday afternoon of the future while the children play *Star Wars* on the screen, the head of the household may be immersed in sport. He watches one game on the big screen while a printer at his side spatters news of other games. With his keyboard he can request the results of other games to be displayed on the screen. He can freeze a frame of the televised play at any moment and examine it. --James Martin²

¹Williams, F. (1982). *The communications revolution*. Beverly Hills, CA: Sage, p. 268.

²Martin, J. (1981). *Telematic society: A challenge for tomorrow*. New York: Prentice-Hall, pp. 121-122.

How do we adapt our private lives to the information society? Living, as we do, in a culture that reveres technology, most Americans imagine the information society as a parade of newly developed technologies enriching the quality of life at home. So strong is this assumption, that it sets the baseline for popular expectations of what the information society has to offer. Williams' view of the future where a computerized nerve center frees the individual of many reasons to leave home is typical; and Martin's scenario, where the latest television technologies deliver a sports fan's fantasy -- access to every game played everywhere -- is a regular story line in the popular media. Indeed, in the 20th century's last decade, neither these predictions nor the homes they imply seem so strange. We have largely assimilated their images and expectations. Yet they only make sense because they carry within them a set of cultural assumptions that we take for granted.

Both scenarios imply a kind progress resulting from new inventions of machine technology. They make sense because Americans embrace an optimistic technological determinism that anticipates new technologies in the belief that they will elevate the quality of life.³ Each describes a personal environment dense with channels for receiving information. But neither hints at how the individual will cope with the flow into the home, nor does either

³Technological determinism is the belief that changes in technology drive changes in society. See for example, David, P. A. (1986). Understanding the economics of QWERTY: The necessity of history. In W. N. Parker (Eds.), *Economic history and the modern economist* (pp. 30-49). Basil Blackwell Inc. Heilbroner, R. L. (1967). Do machines make history? *Technology and Culture*, 8(3), 335-345. Winner, L. (1977). *Autonomous technology: Technics-out-of-control as a theme in political thought*. Cambridge, MA: MIT Press.

scenario suggest whether information will arrive in some intelligible context or as so many fragments. In the first scenario, the individual, emerges as an information seeking professional actively charting a course through the technological landscape of the information society. But in the second description, we imagine a sedentary male (in a rather traditional household) encircled by technology for consuming sports information and seemingly buffered from the rest of his family. The message is that information choices express domestic life styles in much the same way as does the purchase of a house or wardrobe. Differences in patterns of information use serve to distinguish one from one's peers, and so become the basis for defining oneself as an individual unique from the rest. Clothes no longer suffice to make the man. Information consumption has become the new basis for defining the individual.

The purpose of this chapter is to review the state of information technology in the home; but, more so, to identify some of the social forces that have contributed to the evolution of the household as a media environment. My intent is to go beyond a description of devices and services to an exploration of the long-term influences which have shaped the information environment of the home.

Information as a Domestic Good

To ask what kinds of information Americans "consume" makes some sense in a consumer culture but it misrepresents the nature of information. After all, the reading of a newspaper produces no

deterioration in the information itself, even though the value of the information may decrease as it loses its timeliness for the reader. However, the measure of value derives from the user, not from the information. In addition, the paper itself degrades with use and time, but this constitutes consumption of the medium or package not of the information. Neither of these consequences cause "exhaustion" or "depletion" of the information, nor match the experience of consuming material goods like food or clothing.⁴ Yet the concept of "consumption" is an appropriate one because patterns of information consumption bear similarities to patterns for consuming material goods. Consumers master the evaluation, purchase, replacement, and display of information exactly as they do for other goods. Plus, they purchase many information goods in the same markets in which they purchase material goods. Over the course of the 20th century, the confluence of culture and capitalism has encouraged Americans to adapt themselves to the peculiarities of information consumption .

This confluence can best be observed in the home. In most American households, the television schedule anchors the range of potential evening activities and set the limits of information consumption. A 50 channel system makes available 400 half hour programs in the course of a 4 hour evening. However, programs arrive in a totally fragmented way, with the content from one showing no apparent connection to the next. Moreover, if the

⁴Of course, information may be lost. One of the seminal documents of the information age, the original organization chart drawn up by Daniel C. McCallum for the New York and Erie Railroad has been lost to history. When a record no longer exists, and no human remembers, then information is irretrievable.

viewer has lingering interest in a subject, there is no way to continue once the program ends. In the course of a long evening, an individual might watch 6 to 8 independent programs interlaced among 100 to 180 distinct commercials. Actual time spent varies. Working individuals spend roughly two hours per day watching TV, while non working or older viewers spend more time in front of the set.⁵ On the verge of an interactive future, the total television experience is dictated externally, with minimal participation required of the viewer.

Time spent with television and the range of television- VCR- cable possibilities illustrates the central facts of domestic information consumption. First, the makeup of households varies enormously -- from a collection of individuals (sometimes just one individual) to a traditional family unit. Second, all households integrate imported content with acquired technology. A brief review of the makeup of the household illustrates the multitude of experiences and provides an entry into the information environment.

The concept of the household belies the variety of the American experience. There are 95.7 million households in the United States. 52.5 million, or 55%, are traditional in the sense of a married couple constituting the core. Nearly 8 million (12%) are headed by women. Of all households, the census counts 7.7 million (8%) as African American, plus another 5.2 million (5.5%) as Latino.⁶

⁵Kubey, R., & Csikszentmihalyi, M. (1990). *Television and the quality of life: How viewing shapes everyday experiences*. Hillsdale, NJ: Lawrence Erlbaum, pp. 70-75.

⁶What's in a name? A lot. In the Census, black is the operant term for African-American, and is a racial category, while Hispanic is an ethnic

A further 25% contain solitary individuals, totaling 24 million single person households. Furthermore, few of these characteristics are mutually exclusive; and, when considered along with the possible combinations of intermingling variables that contribute to the range of social characteristics of households, one can see that America looks more like a quilt than a whole cloth.⁷

The decline of the traditional family structure has long been lamented, and, in the last forty years, connected with television. From its first bloom at the 1939 New York world's fair, critics wondered whether television eroded American morality, values, and taste. Parents fretted over their children's viewing habits and asked if TV expanded knowledge or spread ignorance. Others wondered whether steady ingestion of TV fare might cause premature loss of innocence or even lead to criminal tendencies. The more psychologically oriented hypothesized that television might cause abnormal behavior such as viewing addiction or withdrawal from

category. Therefore, some blacks are also Hispanics, and some Hispanics are also whites. In addition, it should be noted that the use of the term black by the census has validity within policy circles while African-American has gained popularity within that community. Similarly, Hispanic reflects the adoption of that term by the Census. Within the cultural communities encompassed by the category "Hispanic," self descriptors such as Latino, Mexican-American, Chicano, Cuban, and Puerto Rican, have currency. My point is that one should exert caution when interpreting these categories. They are not mutually exclusive, nor do they capture monolithic communities. At best, the externally imposed categories are tenuously valid. Only the self descriptors -- however much they change -- have consistent validity, since they capture the self-expressed identity of the various ethnic groups.

⁷Tables 65, 66, 67. (1993). *Statistical abstract of the united states: 1993*. Washington DC: Bureau of the Census. Statistics are for 1992.

social interactions.⁸ Many parents accused television of ruining the eyes of their children. Ironically, what goes for television also goes for other domestic media. Indeed, domestic media have always served as a lightning rod for parental fears.

However, it is the tendency toward the individualization of the household that offers greater potential for understanding the information environment in the home. The two salient facts are that: 1) the number of persons per household has fallen consistently throughout the 20th century (Figure 1); and, 2) the number of single person households has risen (Figure 2).⁹ Both of these developments have occurred at a time when Americans have increased the numbers of information devices in their homes. And, it seems likely that the connection goes beyond coincidence. Individuals living alone tend to be high users of media; plus, the biggest increases in household individualization have taken place since 1975, the period when the largest numbers of media have entered homes. The more

⁸Schramm, W., Lyle, J., & Parker, E. B. (1961). *Television in the lives of our children*. Stanford, CA: Stanford University, pp. 1-10.

⁹What is a household? According to the Bureau of the Census, "A household includes the related family members and all the unrelated persons, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated persons sharing a housing unit as partners, is also counted as a household. ... The figures for number of households are not strictly comparable from year to year. In general the definitions of household for 1790, 1900, 1930, 1940, 1950, 1960, and 1970 are similar. Very minor differences result from the fact that in 1950, 1960, and 1970, housing units with 5 or more lodgers were excluded from the count of households, whereas in 1930 and 1940, housing units with 11 lodgers or more were excluded, and in 1790 and in 1900, no precise definition of the maximum allowable number of lodgers was made." (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO, p. 6. Here, I use "household" to refer to the individuals living together in one housing unit; whereas, I use "home" to refer to the dwelling.

people live alone, the more media serve as companions. The more media become available, the more living alone becomes attractive as an alternative life style.

Figure 3 gives a visual glimpse of the profound transformation of the home by the new media that became available starting in the 1970s but swelling to a crescendo in the '80s.¹⁰ The overarching image is one of increasing abundance. American homes are now furnished with much more than phones, stereos, radios, and TVs. Household interiors contain video games, compact disc players, VCRs, remote controls, camcorders, PCs, modems, fax machines, answering machines, home security systems, and home satellite receivers. Also, old media continue to evolve; the phonograph has become a stereo, the television is also a monitor, and the telephone is but one of several keyboards present in the home. Added to the density of the media environment is the tendency to own multiples. At least when it comes to the electronic media, consumers continue to follow a long tendency to add to their existing media environments (Figure 4).

Growing density of material devices has also paralleled increases in amounts of domestic time spent with media. Until the '90s, television viewing increased (Table 1). But with the introduction of new media into homes, some tradeoffs in behavior

¹⁰In this essay, I prefer the term "media" to the increasingly popular "technology." When discussing those devices for the processing of information that can be found in many homes, the term "technology" is indeed appropriate. However, "technology" excludes some important domestic channels for transmitting information, such as newspapers, or books -- channels that are essential to an understanding of the information environment of the home. Media is the more inclusive term and is so used here.

are taking place. For example, while 28% percent of the adult population watches 3 or more hours of TV on an average day, only 20% do so if they own a computer, and that number drops to 16% of the computer user also owns a modem. By contrast, computer users with modems spend 60 minutes per day reading on average, while non computer users expend 47 minutes on reading. And, computer users tend to score higher on political knowledge.¹¹ One might respond that individuals with more education will be more likely to use computers and less likely to watch TV; and, granted, the above data also lends itself to an explanation depending on level of education. But level of education did not distinguish television viewing in the '70s or for most of the '80s.** In other words, what used to be a fairly homogeneous audience for TV is now breaking up into smaller population groupings that actively use combinations of media. These new fragments, or market segments to advertisers, have become enormously complex, since so many media mixes are now possible.

One growing fragment deserves note. Millions are now working at home because the time honored tradition of self-employment has combined with a push by corporations to hold down costs by exporting work. The result is that some Americans have converted their homes into centers of production while others split work time between home and office. Eighteen percent of the working population is self-employed for some of the time. Another

¹¹Kohut, A. (1994). Technology in the american household Times Mirror Center for the People and the Press, p. 5, 7.

27% work at home for a portion of their work time; and, of this group, 40% use a computer at home, while 13% use a fax machine.¹² A reinvention of the home is underway that transcends the introduction of media to the home for purposes of domestic convenience and leisure.

Such a use of the home and of media is possible due to the remarkable convergence taking place among information technologies. Fifteen years ago an individual relied on slow mail or voice-to-voice telephone, in order to send a message. Now the possibilities encroach on each other for attention. There are: faxes -- telephonic print; e-mail -- asynchronous electronic written letters; diskettes -- asynchronous electronic written or visual messages; CD ROMS -- other asynchronous electronic written or visual messages; and, voice mail -- asynchronous oral letters. Plus, this is one narrow example. Multimedia services that were once confined to a specific medium are either available now or soon to be.

The picture that emerges is one of a home increasingly dense with information devices as new ones are added every year or so. Yet, however popular, that image is misleading. Americans are transforming their homes by doing more than adding new media; they are also displacing old media. Figure 4 gives some idea of the historical consequences of introducing new media. As the number of radios, televisions, and VCRs has increased per household, newspapers have suffered a gradual decline. On the other hand, the interactions among the devices introduced in homes in the 1980s is

¹²Kohut, pp. 9, 10.

too recent to draw conclusive inferences. Thus, the historical data is of value because we can see interaction over time. Moreover, the processes of interaction remain the same, so that we can safely infer that displacement among media will occur as the new media of the '80s find their niches.

However, a closer examination of figure 3 indicates that we are not moving toward a new homogeneity. For one thing, diffusion rates vary. VCRs, CDs, and answering machines have diffused quite rapidly (although they have not approached the diffusion rates for radio and television). By contrast, cable, security systems, and satellite receivers have diffused at a slower pace. Finally, projected saturation rates for media differ. Video games are associated with children and likely to reach saturation rates at a level close to the percentage of households with children (70%).¹³ Camcorders are also associated with children, or at least parents with small children, so that the saturation level is likely to be lower than for a universal medium like radio. What is clear is that projecting the saturation level for any medium is difficult. In the case of camcorders, it is further complicated by the fact that they are much more likely to be found in high income households than in low income households; 48% of households with incomes of \$50,000 or above own camcorders versus 13% of households earning \$20,000 or less.¹⁴ So, while all American households own some of the same media, and all are

¹³Kohut, p. 42. Table 70. (1993). *Statistical abstract of the united states: 1993*. Washington DC: Bureau of the Census. Statistics are for 1992.

¹⁴Kohut, p. 43.

moving toward including more media with devices owned in multiples, they are not all moving toward owning the same media. The domestic terrain of the future will contain significant differences in media ownership between those of high income and those of low income.

Finally, it seems likely that nearly all time spent at home will fall within view or earshot of some media. With the arrival of new interactive technologies, some households will use televisions like computers while others will use computers like televisions. In still other households, the center of the household universe will be occupied by a system which melds the characteristics of both but is not easily recognizable as either one or the other. If the home is dominated by interactive technologies, the members will probably become more proactive in their consumption of media (conceivably following the model proposed by Williams in the introductory quote). Negotiating daily life already consists of coping with a blur of messages; and, in the new interactive environment, this tendency will intensify. Messages will continue to arrive in a highly fragmented mode, sometimes simultaneously, each independent of the other and competing for the individual's attention.

The lessons of history

The 20th century marks the move by Americans toward the consumption of information goods. The integration of national markets for material goods set the stage for the availability of

information goods [and services] and their inclusion in the consumer culture appearing in the early decades of the century.¹⁵

Americans exhibited a tremendous appetite for media from the start. In 1925, 10% of all households owned radios (see Figure 5). By 1930, ownership stood at 46%. Ten years later, having suffered the privations of the Depression, Americans still managed to increase ownership of radios to 82% of all households. They bought radios at an astonishing rate, especially when one considers that the Depression forced personal expenditures on information goods and services to drop from 4.4% of all personal expenditures in 1930 to 3.5% in 1935, not recovering the 1930 level until 1945.¹⁶ In addition, radio technology of the time meant that when Americans decided to purchase a radio many of them bought an expensive piece of furniture. Despite these obstacles, radio achieved virtual saturation by 1950, just in time for the arrival of the next wave -- television. Less than one household in ten owned TVs in 1950. However, fifteen years later, less than one household in ten remained

¹⁵See, for example, Beniger, J. R. (1986). *The control revolution*. Cambridge, MA: Harvard University Press. Dordick, H. S. (1988). The emerging information societies. In J. R. Schement & L. Lievrouw (Eds.), *Competing visions, complex realities: Social aspects of the information society*. (pp. 13-22). Norwood, NJ: Ablex. Schement, J. R. (1989). The origins of the information society in the united states: Competing visions. In J. Salvaggio (Eds.), *The information society*. (pp. 29-50). New York: Lawrence Erlbaum. Schiller, H. I. (1988). Old foundations for a new (information) age. In J. R. Schement & L. Lievrouw (Eds.), *Competing visions, complex realities: Social aspects of the information society*. (pp. 23-31). Norwood, NJ: Ablex.

¹⁶Series E 135-166, G 416-469 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Table 708, 738 (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 676 (1987). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census.

without a TV. Television's complete adoption took less time than radio. When they first came on the market, purchases of radio and television sets [and VCRs] represented significant first-time costs. But as demand rose, technology advanced, and economies of scale took hold, prices dropped so that most households in the 1990s own, on the average, 5 radios and 2 TV sets.

The diffusion of information services present a somewhat different pattern. Cable, for example, emphasizes a different set of choices. Unlike radio and TV, the decision to purchase cable services means continuous payments. Plus, an extensive wired infrastructure must exist prior to the delivery of services. Not surprisingly, the diffusion curve for cable looks less steep. But as with radio, cable penetration grew even through the sharp recession of 1982-83; and, by 1989, 53% of all households subscribed to cable services.

Telephone services are similar in that they require the decision to pay a monthly fee, and the building of an infrastructure in order for the connection to function. Moreover, in contrast to cable, the telephone infrastructure was built from scratch. So the adoption curve for the telephone looks more gradual. From 1878, when George W. Coy established the first practical exchange, 80 years passed before 3 out of 4 households boasted a telephone.¹⁷ Though the adoption of radio sets proved immune to the Depression, telephone penetration dipped in correlation with personal expenditures. Telephones reached saturation by 1970, with 93% of

¹⁷Brooks, J. (1975). *Telephone: The first hundred years*. New York: Harper & Row, p. 65.

households slowly advancing to 94% in the twenty years since.¹⁸ But for households on the margin, the payment structure of telephone service means a hard choice every month. The 6% of households without telephone service have become a serious policy issue as the switched telephone network underpins the computer-based technology for the next generation of enhancements. Those off of the net now are likely to remain off in the new information infrastructure. Therefore, the one time cost characteristic of Radio and TV (allowing them to circulate second and third hand) forms the core of the media environment for everyone (99% for radio, 98% for TV).¹⁹

Figure 6 depicts the one major counter-current to the tendency toward more dense personal media environments. Like the telephone, daily newspaper circulation fell along with personal expenditures during the Depression. Circulation climbed as Americans recovered economically; so, in 1950, for example, when 9% of Americans owned televisions, daily newspapers circulated at a rate of 514 per 1,000 adults -- virtual saturation if one accepts a figure of 2 adults per household in that year. But once television took off, newspaper circulation fell again. Throughout the '50s, as TV ownership climbed, the dailies faltered. By 1970, the year of

¹⁸Belinfante, A. (1993, July). Telephone subscribership in the United States . (CC Docket No. 87-339). Federal Communications Commission.

¹⁹Series R 1-12. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). *Statistical abstract: 1981*. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). *Statistical abstract: 1992*. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

television's complete penetration, newspaper circulation sank to 459 per 1,000. It never recovered. As of 1985, circulation had dwindled to an all time low of 356 per 1,000. A simple extrapolation of the curve indicates a future of lower circulation and readership. (The social problem of course is that newspapers provide more detailed information of current events than does television, even with the advent of all-news cable channels. By spurning newspapers, Americans abandon a source of information in depth for sources of more simplistic information like television and radio.)

Figure 7 describes conditions of two other media that have fared enigmatically as Americans elaborated their domestic media environments. Motion picture theater attendance generally rose from 1925 to 1945, the golden age of Hollywood. If anything, the Depression years stimulated theater attendance as audiences sought some escape from the monotony of poverty. But the combination of television and the new family life styles of returning World War II veterans, knocked movie theater attendance into a 30 year decline. The curve indicates a turning away from public entertainment in favor of entertainment in the home; but more than that, it reflects the decline of public life and the dominance of the private sphere. Where once theaters and movies were synonymous, movies began to appear on TV; and, in the '80s, VCRs converted the home into a movie theater.

The diffusion curves in figure 5 indicate the astonishing speed with which Americans ushered in radio and TV. From then on, the social environment of the home centered on television; and, as cable and VCRs expanded the TV's possibilities, they crowded out the daily

newspaper. Still, newspapers led the way in one important dimension. The economic support structure of the radio and television industries built on the relationship between advertising and newspapers. The pervasiveness of this order meant that Americans reorganized themselves into a consumer audience for mediated messages; but, in so doing, they also delivered themselves, as a commodity, to be sold by media executives to advertisers.²⁰ That Americans continue to be comfortable with this arrangement explains some of the ease with which they have adapted to the increasing demands made by media on their disposable income.

One last tribute to radio. Even before television eclipsed newspapers, radio led the way. It altered social patterns within the home by presenting a source of continuous messages requiring directed attention and by inducing the families to rearrange their living rooms around the set. Before radio, the phonograph introduced home entertainment where the technology became the focus of recreation. But, whereas the operator and the supply of cylinders (later discs) set the cadence of the phonograph, radio supplied sounds endlessly. In their turn, TV, VCRs, and cable exploited the environment originally created by radio. So, though we often associate television with a revolution in American lifestyles,

²⁰The first to recognize this seeming contradiction was Dallas Smythe. He understood that the exploitation of consumers occurred with their consent. See Smythe, D., W. (1977). *Communications: Blindspot of western marxism. Canadian Journal of Social and Political Theory* (Fall), 1-27. Smythe, D. (1981). *Dependency road: Communication, capitalism consciousness, and Canada*. Norwood, NJ: Ablex.

the revolution began with radio. In fact, TV, VCRs, and cable are better thought of as enhancement technologies for radio. Their rapid rates of diffusion reflect the ease with which people added them to their existing media environments. The fact that individuals easily understood the potential advantages of each new medium speaks to a cultural adaptation accomplished by the introduction of radio. Today's living room barely resembles the parlor; and yet, this seeming discontinuity belies the enduring enthusiasm for media with which Americans continue to collect their gadgets, devices, and appliances.

One Information Society, Many Realities

Surveying the explosion in media of the 1980s, it is clear, if there was ever any lingering doubt, that Americans embrace information technologies as necessities for modern living. But it should be equally clear that the likelihood of a universal media environment is low and that individual uses will vary. Gender, ethnicity, and social class affect the circumstances of work and leisure; and, therefore, influence media environments accordingly. Yet, no matter one's social standing, the media environment, once created, imposes some common experiences.

In most cases, the individual opens a window to an avalanche of messages. A torrent of potential information spews into the filter of personal attention. The few messages that are actually focused upon can still overwhelm an individual; and, of those, fewer still are internalized. From the receiver's perspective the price of building a

dense media environment is information overload, meaning that by far most messages are lost. Moreover, once the media environment is built, this outcome becomes inevitable -- the denser the media environment, the more lost messages. The human brain might appear as a severe bottleneck to an information scientist, but the loss of most messages seems of little concern to Americans as they enthusiastically expand their media environments. If a motivating logic exists for most individuals, it goes something like this:

An increase in the number of information channels ⇒
An increase in the number of messages ⇒
An increase in the amount of new information ⇒
An increase in the amount of knowledge ⇒
An increase in perceived welfare.

Given the above reasoning, few Americans would argue that they are worse off for living in ever denser mediated environments. Besides, the strategy of inclusion appeals to the American sensibility that more is better. Yet coping with the modern avalanche of messages requires a break with traditional logic. In order to function while awash in messages, people intuitively develop a strategy of exclusion. They erect mental blinders to most messages and sift the remainder, often attending to several channels simultaneously. Remarkably, this new strategy seems understood at a basic level. In fact, few people become immobilized when confronting a dense media environment. For the most part, Americans have made a smooth transition from a strategy of information inclusion to one of information exclusion. They required no formal training, not even passing the skill informally from parent to child, although,

admittedly, cases exist to the contrary. So, for example, when managers must make deadline decisions, information overload hinders efficiency. In general, however, the following logic appears increasingly common in the information society, especially in the home:

An increase in the number of information channels ⇒
An increase in the number of messages ⇒
An increase in filtering behavior ⇒
A decrease in messages received ⇒
A limited increase in the amount of new information ⇒
A limited increase in the amount of knowledge ⇒
An increase in perceived welfare.

It seems likely that the two logics co-exist. The old logic serves as an ideological umbrella. It says, "more information is better," and so individuals continue to expand their media environments. In addition, it serves to accommodate us to the information society by cueing us to the importance of information. At the same time, the new logic, which says "selective attention is best," is rapidly becoming our algorithm for actually coping with the waves of messages we face everyday.

What kinds of information do individuals actually receive? For most, the media environment does not create an atmosphere like the one predicted by Williams. Rather than rationally accessing the information most appropriate to the decisions facing the user, the typical household media environment probably comes closer to the model described by Martin -- super entertainment presented as capitalist realism. That observation leads newspaper columnists,

social critics, and academics to wonder, "Can such a climate provide information of use for successfully negotiating daily life?" The answer usually boils down to an exasperated critique of a culture dominated by the lowest common denominator. But this is not a simple question; for, depending on the specific individual, the "Oprah Winfrey Show" may contain more useful information than the "McNeil/Lehrer News Hour."

The reality is that people increase their levels of personal knowledge from all media and from all genres.²¹ Neither the critic nor the individual can predict whether a particular message or genre will contain more or less useful information, although we all approach new information with expectations. For these reasons, the strategy of exclusion almost necessarily contains an inherent element of irrationality. Prior to its reception, no one can predict which message will be of greater use. Therefore, on what basis can one decide which to exclude and which to receive? The answer is none, and all. Since no single algorithm can provide the best tactic for all needs, a strategy of trial and error works best when combined with

²¹See, for example, Comstock, G., Chaffee, S., Katzman, N., McCombs, M., & Roberts, D. (1978). *Television and human behavior*. New York: Columbia University. Davison, W. P., Boylan, J., & Yu, T. C. (1976). *Mass media: Systems and effects*. New York: Praeger. Dorr, A. (1986). *Television and children: A special medium for a special audience*. Beverly Hills, CA: Sage. Katz, E., Blumler, J., & Gurevitch, M. (1974). Uses of mass communication by the individual. In W. P. Davidson & F. T. C. Yu (Eds.), *Mass communication research: Major issues and future directions* (pp. 11-35). New York: Praeger. Wartella, E. (Ed.). (1979). *Children communicating: Media and development of thought, speech, and understanding*. Beverly Hills, CA: Sage. Webster, J. (1986). The television audience/The new media environment. Journal of Communication , 36(3), 77-91.

the maximally dense media environment possible from one's resources; and, interestingly, this is what people seem to do.

Underlying forces

There is more to media environments than technology. To imagine that the emerging information climate in the home results from new technologies, whereby Americans simply absorb each new wave of media, fails to take into account the strong undercurrents that shape the culture. The transformation that began with the telephone and continues to shape the American home reflects far more than a long line of inventions. It is these undercurrents, these social movements, these impulses, that, when understood, place the information age within the context of the national experience.

At the center of the rise of a household media environment is the shift in emphasis from public life to private life, a shift which intensified the demand for media in the home and the willingness to invest in it. In the early decades of the century, leisure revolved around public institutions like the saloon and the village square. But after World War II, entertainment increasingly took place in the privacy of the home. The ethos of industrial work culture with its emphasis on the nuclear family made the home a natural focal point for interactions; and, as the working class aspired to middle class mores, the idea of the home gained even more significance. With the home as the focus of domestic life, it made sense to invest in a radio

in the '20s, a TV in the '50s, a VCR in the '80s, a CD player in the '80s, and a PC for cruising the internet in the '90s.²² However, no tendency goes unchecked. Private life will never displace public life entirely; even so, the tendency toward emphasizing home life will continue to grow, and, therefore, to warrant even more expenditures on electronic furnishings.

In the latter part of the century especially, individualism and fragmentation characterize the social dynamics of households. The decline in the sum total of household members and the multiplication of single person households means that the cohesiveness of the family system no longer holds in growing numbers of living situations. In households with small children, media are often employed as baby-sitters. Older children request and receive the technology necessary to play video games and listen to music, while parents invest in systems allowing the children to play and listen without encroaching on the parent's use of media. The fragmentation which began when parent's of the 1940s bought a second radio to place in the children's bedroom spreads through the walkman and the boom box. Even when a household consists of just one parent and one child, there exists demand for multiple devices and parallel media systems. For single person households, similar motivations prevail. The person living alone tends to consume information in order to supplement human interactions. One radio and one television does not suffice since company is needed in the bedroom

²²It makes sense in a less obvious way to think of a "focus" of domestic life since focus is the Latin word for hearth.

as well as in the living room. And, with no one else to buy for, a solitary individual can indulge his or her tastes for large CD, video, and/or computer game collections. For that matter, interactive media will probably gain their earliest adherence among singles, since they have more discretionary time. Cruising the Internet is an ideal activity when there is no competition for attention from a spouse or child. (As I write this, my 20 month old son has just crawled in and out of my lap, thereby threatening the existence of this file, and my wife has requested that I keep an ear out for the kitchen timer.) So, whatever the makeup of the household, pressures induced by individualism and fragmentation contribute to greater demand for media. As long as these pressures wax, domestic media environments will go from dense to denser.

The demand for media can be further explained by the continuing images Americans hold of their homes. Americans expect the home to serve as a window -- which explains the continued appetite for media and information -- but they also expect the home to serve as a refuge -- which explains the appeal of home-based services that substitute for public transactions. The two images are contradictory, yet serve the purposes of a society with an expanding private sphere. Through the window, members of the household maintain connectedness with events in the larger world, with present and future jobs, and with significant others. Its capacity to focus the nation has astounded observers -- from FDR's inaugural address, through the televised murder of Lee Harvey Oswald, to live coverage of the bombing of Baghdad. In the '90s, the window is rapidly

becoming a node. Still, the desire for a refuge persists.²³ It touches the national nerve because Americans perceive themselves living in a hostile society. Fear of random crime and fear of one's neighbors induces the retreat into the private sphere, so that, for many, the boundary between public and private is not a friendly zone. Ironically, this same fear contributes to the drive to enhance domestic media environments. For if the home is the last refuge from a hostile society, then the media environment functions as a watch tower, and an exceptionally useful one at that. Even so, I don't claim that fear is the primary cause of the expansion in home media that we are witnessing. The desire to supplant public transactions probably ranks higher on the priority list of most Americans. The use of the television, the phone, and the mails, for home shopping, medical service coordination, bill payment, and accessing governmental services, attests to rising importance of the private sphere as the locus of important activities. My point is that the tension between the ideals of the home as window and refuge is consequential and exposes an unrecognized undercurrent influencing the media culture of the home.²⁴

²³Refuge is a conflicted term at the end of the 20th century. For women who suffer abuse from their spouses, and for children who fear their parents, the home is a torture chamber rather than a refuge. My use of the term in this essay does not mean to diminish this pathology of our society. I use "refuge" here to elicit the expectations Americans bring to the ideal of the home. Regardless of what actually happens in domestic space, it is the ideal of the home that guides the motivation to create a media environment capable of seeing into the public sphere while keeping the public sphere at arms length.

²⁴The tension between window and refuge also implies a threat to privacy, although the question of privacy goes beyond the scope of this essay. The sale and resale of databases containing information on individuals has become a central commodity in the information economy that adds a new dimension of

Converting the home into a window has brought consumer culture into the living room and established the home as a significant marketplace. To be sure, the home has long been a marketplace. Once Montgomery Ward, and Sears, pioneered the catalogue in the 19th century, rural families saw the kitchen table as a place for making numerous consumption decisions. But even in the heyday of those catalogues, and for most of the 20th century, the home was considered a secondary place of consumption in the eyes of most of its members. The public sphere retained its magnetism as the locus of consumer culture. After World War II, when families trekked to the suburbs, malls replaced downtown and plate-glass store fronts replaced the ornate portals of the family-owned department stores. Still, consumer culture remained fixed beyond the home. The reinvention of the telephone and the niche catalogue changed all of that. Evolving from simple order placement at the local deli, the convergence of new and old information technologies promises to bring so many purchasing possibilities into the home that Williams' and Martin's scenarios will look primitive (though no one is yet willing to predict the withering away of public shopping with its

social control to the marketplace. Often gathered passively without the subject's knowledge, the presence of this information may also constitute an assault on privacy. Thus, it should not be surprising to find observers of the information society asking how much control over this valuable commodity an individual deserves plus wondering whether there should be limits placed the kind of information gathered and on the gatherers. That Americans have converted their homes into windows suggests that they are willing to tolerate some intrusion. That they expect their homes to function as a refuge suggests that they seek to protect their privacy. As they pursue both ends of this contradiction, they deepen one of the fundamental tensions of the information age. Once thought of as the right to be left alone, privacy is now thought of as the control of information about oneself.

potential for social contact). Furthermore, it is tempting to explain this transformation as stemming from the direct impact of technology; however, the emergence of a consumer culture in the United States goes beyond technology. Its essence is bound up with the significance we attribute to material possessions, and the value we place on individualistic desires.²⁵ Retreat from public life has redirected the focus of consumer culture into the home; and, with that new alignment, there exists a danger. The home as market-window offers so many opportunities to avoid the shoving and nastiness associated with shopping in public, that home consumers may also avoid getting to know their fellow citizens. The siege mentality facilitated by taking the home window seriously may thus contribute to more rigidity on political positions and less empathy for other groups. Personal convenience will be gained at the expense of public consensus. If so, it will be a high price to pay for home shopping.

²⁵The implications of a culture of consumption go beyond the scope of this essay, but they have attracted commentary from some of the greatest thinkers of the century. Here is Erich Fromm. "In our culture ... consuming is essentially the satisfaction of artificially stimulated fantasies, a fantasy performance alienated from our concrete selves. ... We are surrounded by things of whose nature and origin we know nothing. The telephone, radio, phonograph, and all other complicated machines are almost as mysterious to us as they would be to a man from a primitive culture; we know how to use them, that is, we know which button to turn, but we do not know on what principle they function. ... We consume, as we produce, without any concrete relatedness to the objects with which we deal; we live in a world of things, and our only connection with them is that we know how to manipulate or to consume them." Fromm, E. (1955). *The sane society*. New York: Holt, Rinehart and Winston, p. 122. For a more recent view, see Fox, R. W., & Lears, T. J. J. (Ed.). (1983). *The culture of consumption: critical essays in american history, 1880-1980*. New York: Pantheon.

Tied to consumption is production. By converting the home into a node, Americans fuse the workplace to the home as much as the marketplace. Of the 34% of Americans who work at home, 40% use a computer and constitute the core of a growing group of telecommuters.²⁶ The public image of telecommuters stresses themes of self determination -- savvy information age entrepreneurs who have taken control of their lives. However, the reality is more complex. Firms push employees to convert their homes into offices in order to cut down overhead costs by transferring those costs to their employees. When linked to part time employment, telecommuting also becomes a tactic allowing firms to avoid paying for employee benefits. Even so, telecommuting also exerts a pull. Many people like the independence that comes from converting the home into a place of employment; whereby, they can exploit the refuge potential of the home to avoid the time and supervisory constraints of the office.²⁷ Thus, there can be no doubt that telecommuting made possible by the convergence of information technologies has already set a new standard for defining the home.

What is less visible is that, within this new orientation, leisure as a concept poses problems. Clearly, leisure will continue to exist as an ideal. But for telecommuters and others like them it will come enveloped in a flow of work and non work activities more seamless

²⁶Kohut, p. 53.

²⁷The promise is not without perils. Telecommuters can avoid the office but not the office politics. For a fuller discussion of the counter-currents of telecommuting, see Kraut, R. E. (1987). Technology and the Transformation of White-Collar Work . Hillsdale, NJ: Lawrence Erlbaum Associates.

than those experienced by workers where the locus of labor is outside the home. So, when work forms the salient feature of a person's domestic environment, it may be more appropriate to assume that if they are not at leisure they must be at work. Under circumstances like these, work and leisure are likely to take on the characteristics of a digital switch -- at work, at leisure, at work, at leisure -- with the telecommuter moving back and forth continuously. Consequently, the tension between refuge and window will be further complicated by fuzzy boundaries between work and leisure, boundaries made fuzzy because the activities of work permeate the home. As tele-professionals and their individualistic work-home environments increase in numbers, values associated with their circumstances will influence American culture. Fuzzy boundaries will become the established pattern of public and private life, while the older fixed boundaries will further retreat toward the periphery.

An essay by its nature can only address the sparsest of themes. Certainly, much more can be said about the social currents reflected in the domestic media environment. Still, this brief review should dispel the notion that the changing media environment in the home is a simple effect caused by the driving engine of technology. The home has always been a social environment first; therefore, if one wishes to understand it, one must grapple with its social themes. The themes that once formed the old boundaries -- between work and home, between public and private life, between labor and leisure

-- no longer appear so clear or so fixed. The lack of clarity stems, in part, from a century long pattern of increased information consumption, during which Americans melded work and home, public and private life, labor and leisure by building a media environment in the home. In so doing, they have evolved new media use behaviors for negotiating simultaneous messages through multiple channels; while, in the background, the convergence of information technologies has served as the great facilitator. Still, convergence has not meant homogeneity. Instead, the plethora of products pouring onto the market will lead to greater disparities in household experiences as income differences influence the ability to participate in the new information infrastructure. That this prospect concerns policy makers is evident in the continuing debate regarding the gap between the information haves and have-nots. It is, perhaps, the most important debate of the information age; for, though convergence of technologies has ushered in the new era, divergence of experiences will define its promise.

Tables and Figures

Table 1

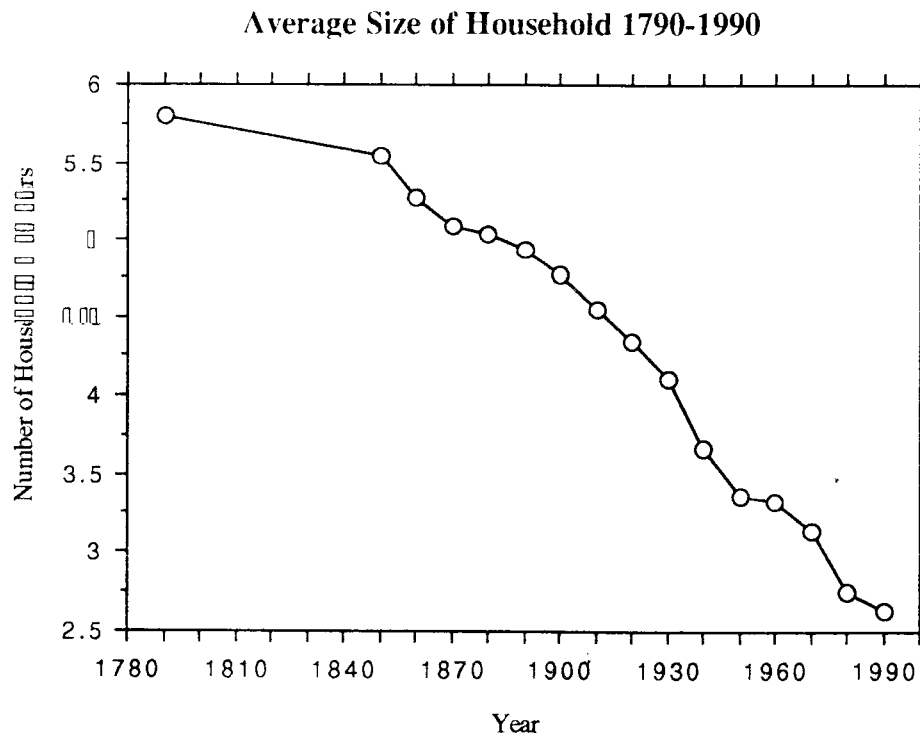
Hours Watching TV (per TV home)

Year	TV watching, average daily hours per TV household (I)	TV watching, average daily hours per TV household (II)
1950	4:35	4.6
1955	4:51	4.9
1960	5:06	5.1
1965	5:29	5.5
1970	5:56	5.9
1975	6:07	6.1
1980	6:36	6.3
1985	7:10	7.1
1990	6:53	

I. Television Bureau of Advertising. Research Dept. (1991). *Trends in viewing*. New York: The Bureau. (Daily I and Weekly)

II. U.S. Bureau of the Census. (1981 & 1986). *Statistical Abstract: 1981, 1987*. Washington, D.C.: The Bureau. (Daily II)

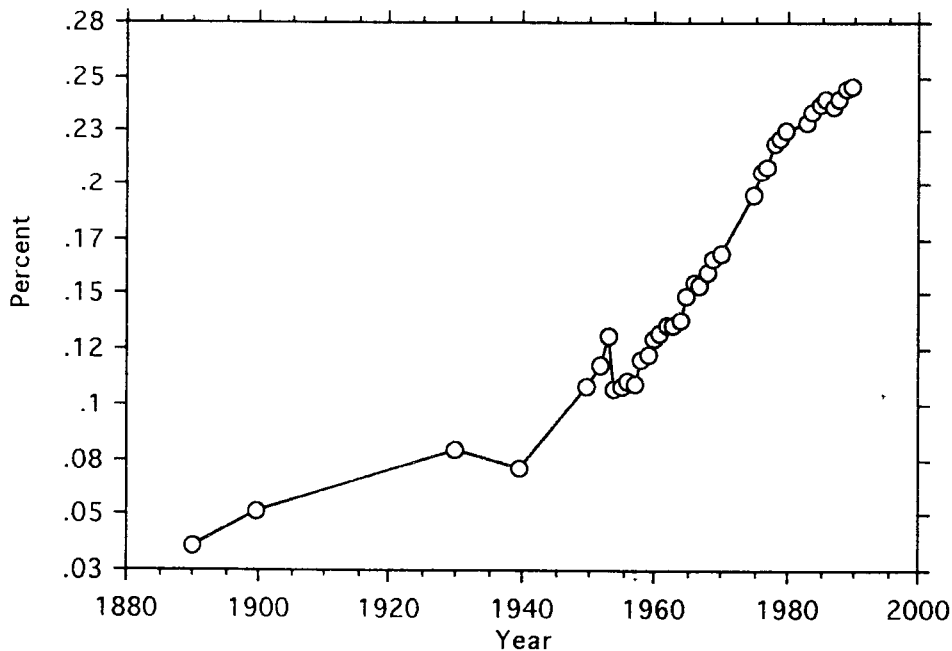
Figure 1



Compiled from: Table Series G 495-581. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. (1991) *Statistical abstract of the united states: 1991*. Washington DC: Bureau of the Census.

Figure 2

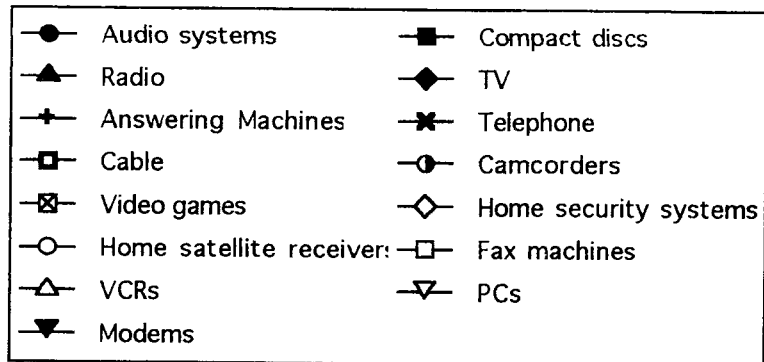
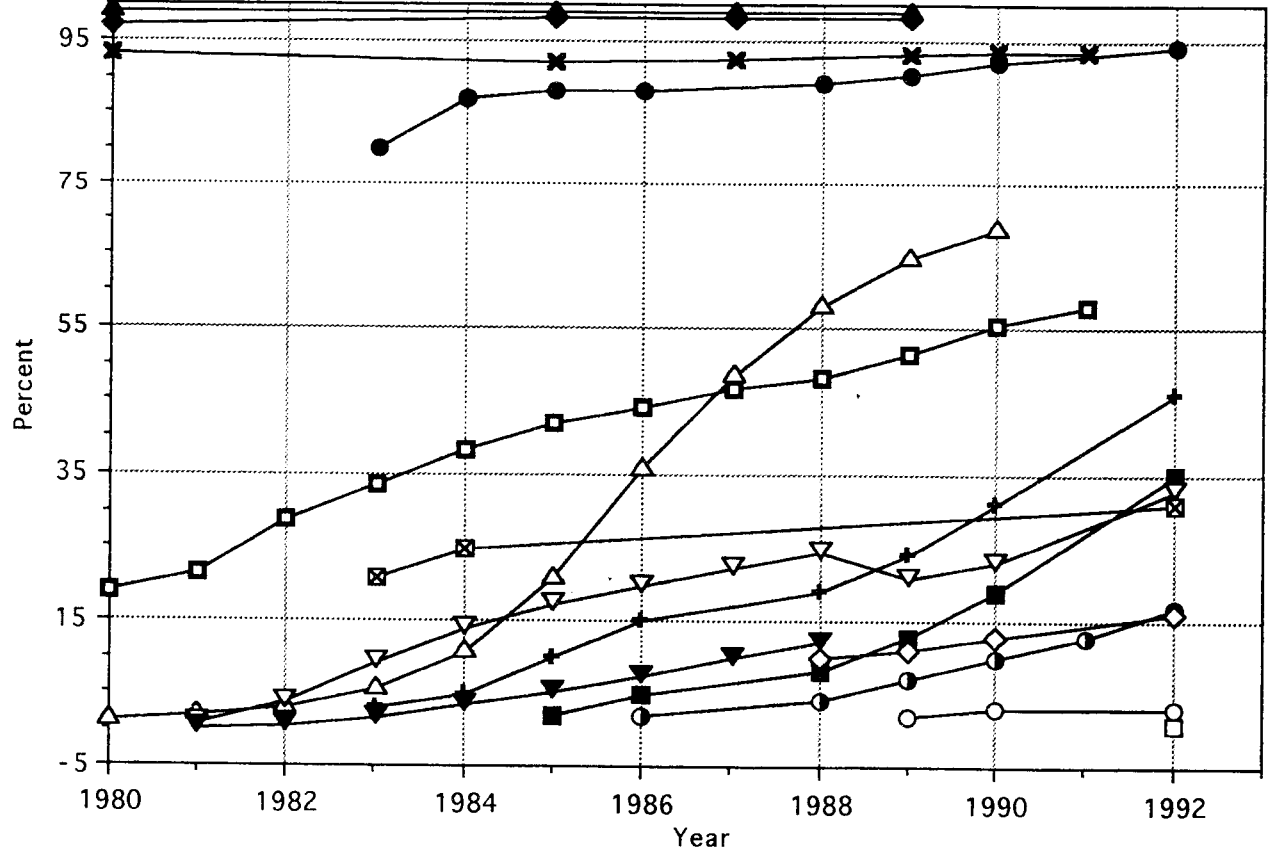
**Single Person Households
as a Percentage of Total Households
1890-1990**



Compiled from: Series A 288-319, 335-349. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 60. (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 56. (1988). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census. Table 55. (1990). *Statistical abstract of the united states: 1990*. Washington DC: Bureau of the Census. Table 2. (1991). *Statistical abstract of the united states: 1991*. Washington DC: Bureau of the Census.

Figure 3

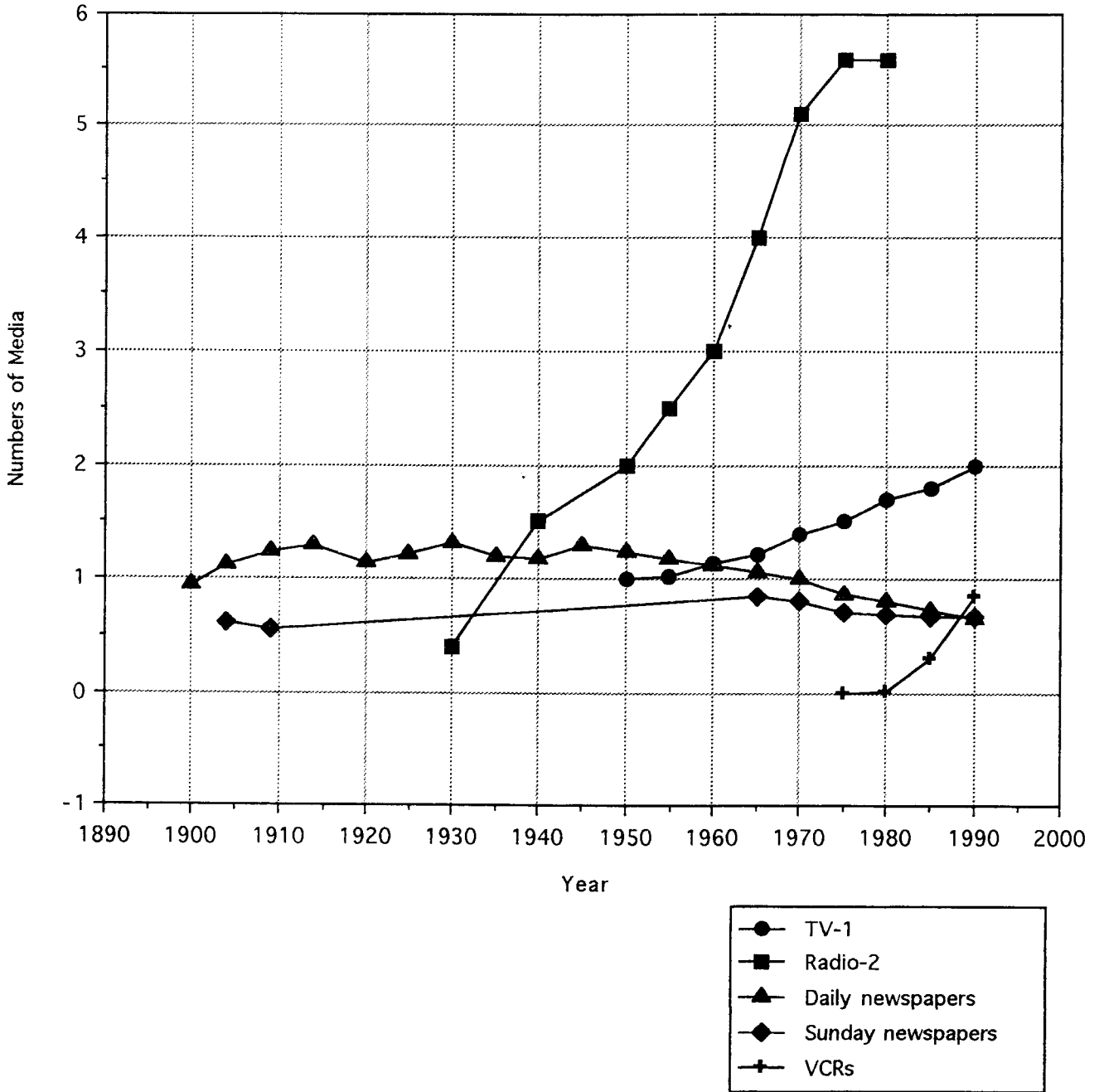
Household Penetration of Selected Media
 1980-1993



Compiled from: Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics . (CC Docket No. 80-286). Federal Communications Commission. Electronic Industries Association. (1984-90, 1992). *The U.S. Consumer Electronics Industry Annual Review*. Washington, D.C.: The Association. Electronic Industries Association. (1992). *Electronic market data book*. 1992 ed. Washington, D.C.: The Association. Television Bureau of Advertising. Research Dept. (1991). *TV & Cable Factbook No. 60, 1992*. U.S. Bureau of the Census. (1986, 1990, 1991, 1992). *Statistical abstract*. Washington, D.C.: The Bureau.

Figure 4

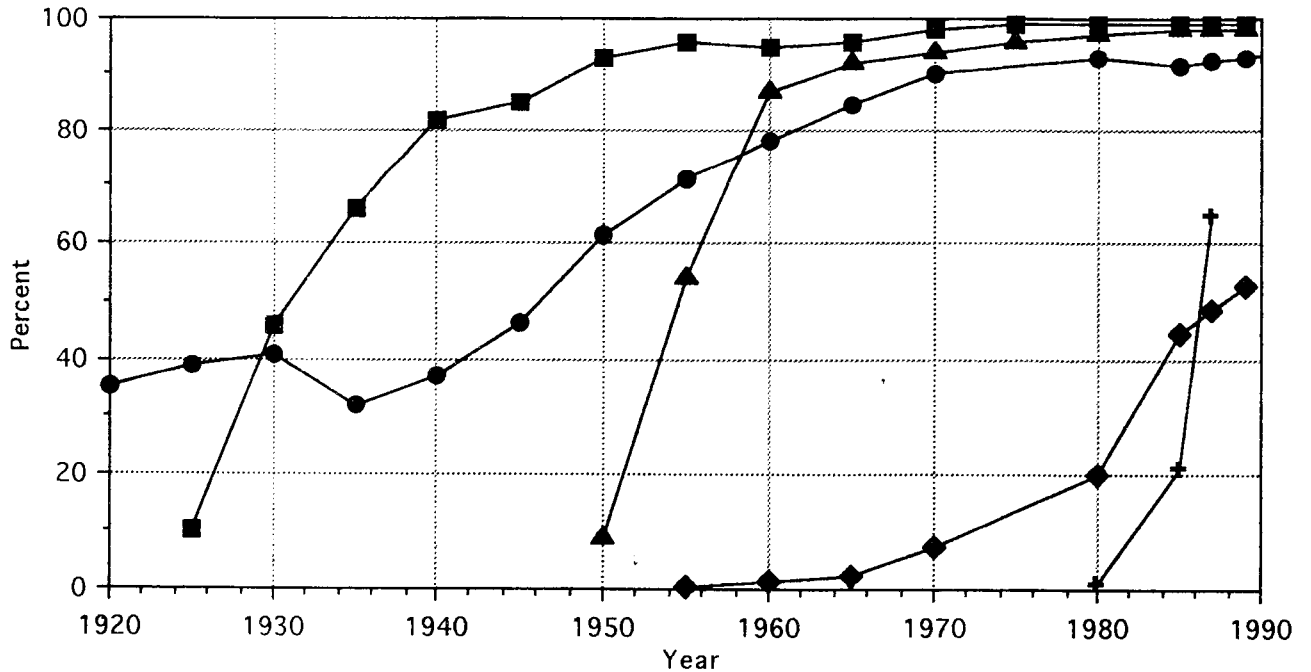
Average Numbers of Selected Media in the Home
 (Daily and Sunday Newspapers, Radios, TVs, VCRs)
 1900-1990



Compiled from: U.S. Bureau of the Census. (1981). *Statistical abstract: 1981*. Washington, D.C.: The Bureau. U.S. Bureau of the Census. (1991). *Statistical abstract: 1991* Washington, D.C.: The Bureau. *Trends in Media*, 1991. U.S. Bureau of Census. (1975). *Historical statistics of the United States: colonial times to 1970*. (Bicentennial ed.) Washington, D.C.: The Bureau. *TV & Cable Factbook*, no. 60 (1992).

Figure 5

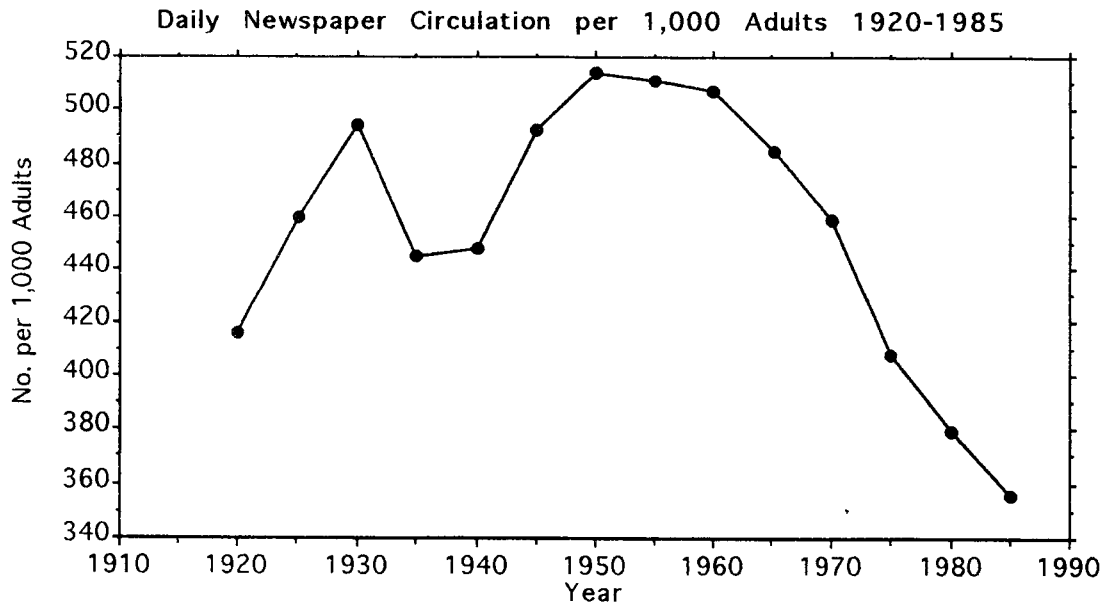
Diffusion of Selected Media
 Household Penetration of Selected Media
 1920-1990



- Telephone, percent penetration per household
- Radio, percent penetration per household
- ▲ Television, percent penetration per household
- ◆ Cable, percent penetration per household
- + VCRs, percent penetration per household

Compiled from Series R 1-12. (1975). *Historical statistics of the United States, colonial times to 1970* (Bicentennial Ed. ed.). Washington DC: GPO. Table 956. (1981). *Statistical abstract: 1981*. Washington, D.C.: U.S. Bureau of the Census. Table 884. (1992). *Statistical abstract: 1992*. Washington, D.C.: U.S. Bureau of the Census. Table 1.1, 1.3 Belinfante, A. (1991). Monitoring report: Telephone penetration and household family characteristics. (CC Docket No. 80-286). Federal Communications Commission.

Figure 6

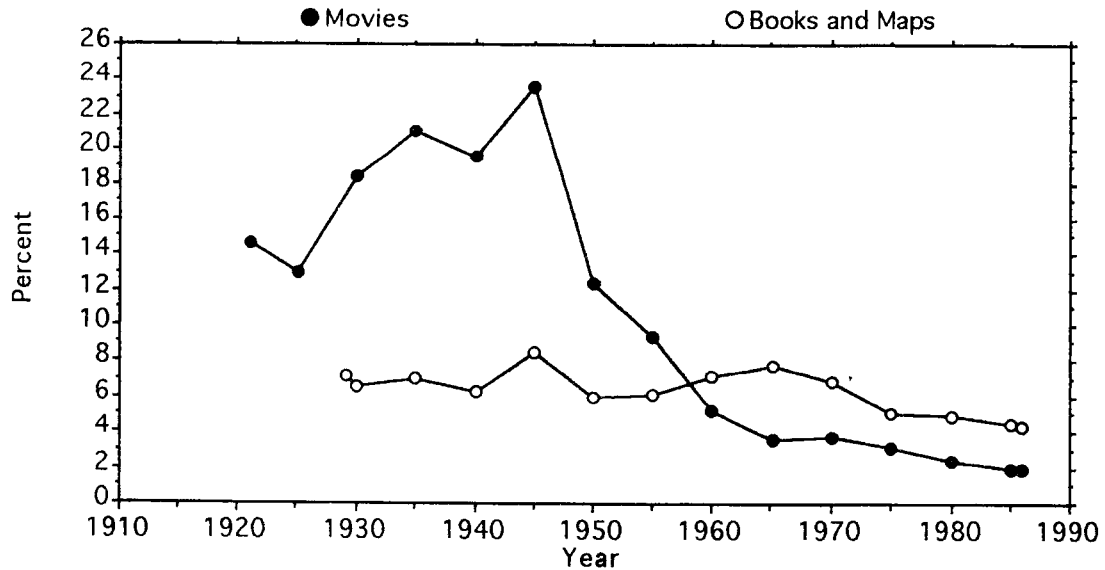


Compiled from Series A 29-42, R 224-231 (1975). *Historical statistics of the united states, colonial times to 1970*. Washington DC: GPO. Tables 13, 878 (1987). *Statistical abstract of the united states: 1988* Washington DC: Bureau of the Census.

Note: Adult population includes individuals 18 years of age and over.

Figure 7

Admissions to Motion Picture Theaters, and Purchases of Books and Maps, as a Percent of Total Personal Consumption Expenditures for Recreation: 1921-1986



Compiled from: Series H 878-893 (1975). *Historical statistics of the United States, colonial times to 1970*. (Bicentennial Ed. ed.). Washington DC: GPO. Table 396 (1981). *Statistical abstract of the united states: 1981*. Washington DC: U.S. Bureau of the Census. Table 363 (1987). *Statistical abstract of the united states: 1988*. Washington DC: Bureau of the Census.

Note 1: The Bureau of the Census combines books and maps. No consistent figures for books alone were found, though it is reasonable to assume that books make up the large bulk of this category.

Note 2: percentages for 1970-1987 reflect revisions to Personal Consumption Expenditure categories introduced in 1981.