

11. RESEARCH ON LEARNING FROM TELEVISION

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This chapter summarizes a body of literature about instructional technology that is unique not only in its depth but also in its breadth and importance. A recent search of articles in the Educational Clearinghouse on Information Resources (ERIC) since 1966 yielded 17,500 citations on television; while a similar search in Psychology Abstracts produced 1,882 citations about television since the mid—1980s. It is fitting, therefore, that there be a chapter in this handbook which reviews how instructional technology has used research on television as well as how the field has contributed to this body of research.

11.1 NATURE OF THE CHAPTER

In order to address research on learning from television,² it is necessary to define this phrase. For the purposes of this chapter, learning is defined as changes in knowledge, understanding, attitudes, and behavior due to the intentional* or incidental effects* of television programming. Thus, learning can occur intentionally as a result of programming that is planned to achieve specific instructional outcomes or incidentally through programming for entertainment or information purposes.

Three elements of the television viewing system* are covered: the independent variable or stimulus, mediating variables, and the resulting behavior or beliefs. The television viewing experience* is based on the interaction of these three components of the viewing system, which are usually described as programming, environment, and behavior. Each of these elements encompasses many variables; for example, message design* and content are programming variables. Viewer preferences and habits are environmental variables that mediate. Individual differences are also mediating variables in that they affect behavior. Learning and aggressive or cooperative behaviors are dependent variables.

For this review to serve an integrative function, it was necessary to be selective in order to comprehensively cover many areas. Several parameters were established to aid in selectivity. The first decision was that film and television research would be integrated. Although they are different mediums, their cognitive effects are the same. The technologies underlying each medium are quite different; however, for instructional purposes, the overall appearance and functions are essentially the same, with television being somewhat more versatile in terms of storage and distribution capabilities. Furthermore, films are frequently converted to television formats, a fact that blurs the distinction even more. Research on learning from television evolved from research on learning from motion pictures. Film research dominated until about 1959 when the Pennsylvania State University studies turned to research on learning from television. Investigations related to one medium will be identified as such; however, effects and other findings will be considered together. Classic research on both film and television is reviewed.

Nevertheless, relatively little space is devoted to film research because an assumption was made that there were other reviews of this early research, and its importance has diminished. It seemed more important to emphasize contributions from the last 20 years, especially since they are overwhelming the consumer of this literature by sheer volume.

Another decision was that although some important international studies would be reported, the majority of studies covered would be national. This was essential because

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² A glossary of terms related to learning from television is given at the end of the chapter. The first time a term defined in the glossary appears, it will be marked with an asterisk.

the international body of literature was gargantuan. Those who wish to pursue international literature are advised to start with a topic that has existing cross-cultural bibliographies, such as the Sesame Street Research Bibliography (1989) available from Children's Television Workshop (CTW).

In addition, it was necessary to determine what to include and exclude in relation to the other chapters in the handbook. All distance learning (see Chapter 13) and interactive multimedia studies (see Chapter 29) were excluded because other chapters cover the newer technologies. Some media literacy* will be covered because it is a very important variable in learning from television. Nevertheless, it is assumed that aspects of visual literacy (i.e., visual learning and communication) will be covered throughout the handbook (see Chapters 16 and 26), not just in this chapter.

It was further decided that a variety of methodological approaches would be introduced, but that discussion should be limited because the final section of this handbook covers methodologies (see Chapters 39 to 42). Methodological issues, though, will be addressed throughout this chapter.

Our final decision was that this chapter would make a comprehensive effort to integrate research from both mass media* (see sections 4.4.1 to 6) and instructional television.* Although other publications have done this, generally one area dominates, and consequently the other is given inadequate attention. It was our intent to start the process of integrating more fully the literature from mass media and instructional television.

11.1.1 Relevance to Instructional Technology

Research on learning from television encompasses more than formal instruction. This body of research addresses learning in home as well as school environments. Many of the findings are relevant to the instructional technologist; for example, research on formal features* yields guidelines for message design (see Chapter 26). Instructional technologists can both promote students' learning to regulate and reinforce their own viewing* and educate parents and teachers about media utilization.

In addition, instructional technologists are also responsible for recommending and supporting policy that affects television utilization. The literature provides support for policy positions related to (a) control of advertising and violence* (see 11.7.4, 11.2.3), (b) parent and teacher training (see 11.5.3.5, 11.7.2.1), (c) provision of special programming (see 11.7), and (d) media literacy education (see 11.8.2).

Researchers in instructional technology can determine gaps in the theoretical base by using reviews such as this. In the future, more research that relates variables studied by psychologists to variables studied by educators will be re-

quired in order to identify guidelines for interventions and programming.

11.1.2 Organization of the Chapter

The chapter is organized chronologically and categorically in order to cover both research on the utilization of television in education and mass-media research on television effects. The beginning of the chapter chronologically traces the evolution of research in this area. Other sections, which are organized by subject, review theoretical and methodological issues and synthesize the findings. A glossary of terminology related to television research is given at the end of this chapter.

The chapter starts with a historical overview. After this introductory background, the chapter turns to sections organized categorically around major issues, some of which are independent or mediating variables, and others of which are effects. The first section synthesizes research on message design and mental processing. It reviews how formal features affect comprehension* and attention.* The next issue section deals with the effects of television on school achievement. Turning to what is known about the effects of the family, viewing context, viewing environments,* and coviewing* are reviewed next. The effects of television on socialization* are explored through attitudes, beliefs, and behaviors. The next section covers programming and its utilization in the classroom and home. The final section covers theory on media literacy and mediation* through critical viewing skills.* The organization of the chapter follows this outline:

1. Historical overview
2. Message design and cognitive processing*
3. School achievement
4. Family-viewing context
5. Attitudes, beliefs, and behaviors
6. Programming and utilization
7. Critical-viewing skills
8. Glossary of terms

It was necessary to approach the literature broadly in order to synthesize effectively. Despite the disparity in types of research and areas of focus, most of the studies provided information about interactions that affect learning from television.

11.2 HISTORICAL OVERVIEW

Much research on the effects of television is contradictory or inconclusive, but that doesn't make the research useless, wasteful, or futile. We need to know as much as we can about how children learn, and conscientious research of any kind can teach us, if nothing else, how to do better research (Rogers & Head, 1983, p. 170).

As Fred Rogers and Barry Head suggest, to use research on television, one needs a historical perspective. The pur-

pose of this section is to provide that perspective. It will briefly explain the evolution of the technologies, important historical milestones, the evolution of the research, and the variety of methodological approaches used. After reading this section, you should be able to place the research in historical context and understand its significance.

11.2.1 Contributors to the Literature

This large body of research is the result of individuals, organizations, and fields with constituencies naturally interested in the effects of television. The disciplines that are most dedicated to reflecting on learning from television are education, communications, psychology, and sociology. Within education, the fields of educational psychology, cognitive science, and instructional technology have a continuing interest. Educational psychology and cognitive science have focused on mental processing. Instructional technology has made its greatest contributions to television research through the areas of message design, formative evaluation,* and critical-viewing skills.

11.2.1.1. Organizations. Groups associated with research on television operate in diverse arenas. Government institutions, such as the National Institute of Mental Health (NIMH), the Educational Resources Clearinghouse on Information Resources (ERIC), and the Office of Research in the Department of Education have been the catalyst for many studies. Government has influenced research on television through hearings and legislation on violent programming and commercials for children. Government legislation also created the Public Broadcasting System (PBS).

Many universities have established centers or projects that pursue questions about the effects of television. These include the Family Television Research and Consultation Center at Yale University, the Center for Research on the Influence of Television on Children at the University of Kansas, the National Center for Children and Television at Princeton, and Project Zero at Harvard University. Foundations have supported research in the areas of media effects and instructional television, including the Spencer, Ford, and Carnegie Foundations. Public service organizations such as Action for Children's Television and church television awareness groups have spurred policy and research.

Research and development (R&D) organizations, such as the Southwest Educational Development Laboratory, have generated curricula on critical-viewing skills. Children's Television Workshop (CTW), the producer of Sesame Street, is an R&D organization that not only develops programming but also does research on the effects of television.

11.2.1.2. Review Articles and Books. Despite such long-term efforts, much of the literature on television lacks connection to other findings (Clark, 1983, 1994; Richey, 1986). The conceptual theory necessary to explain the relationship among variables is still evolving. Because of this,

consumers of the literature are sometimes overwhelmed and unable to make decisions related to interactions in the television viewing system of programming, environment, and behavior.

Comprehensive and specialized reviews of the literature are helpful for synthesizing findings. Individual studies contribute a point of view and define variables, but it takes a review to examine each study in light of others. Fortunately, there have been many outstanding reviews of the literature. For example, Reid and MacLennan (1967) and Chu and Schramm (1968) did comprehensive reviews of learning from television that included studies on utilization. Aletha Huston (1972) wrote a chapter for the National Society for the Study of Education (NSSE) yearbook on Early Childhood Education entitled "Mass Media and Young Children's Development" which presented a conceptual framework for studying television's effects. In 1975, the Rand Corporation published three books by George Comstock which reviewed pertinent scientific literature, key studies, and the state of research. Jerome and Dorothy Singer reviewed the implications of research for children's cognition, imagination, and emotion (Singer & Singer, 1983). In that article, they described the trend toward studying cognitive processes and formal features. By 1989, the American Psychological Association had produced a synthesis of the literature titled *Big World, Small Screen*.

Other reviews have concentrated on special areas like reading skills (Williams, 1986); cognitive development (Anderson & Collins, 1988); instructional television (Cambre, 1987); and violence (Liebert & Sprafkin, 1988). Lawrence Erlbaum Publishers offers a series of volumes edited by Dolf Zillmann and Jennings Bryant on research and theory about television effects.

Light and Pillemer (1984) argue against the single decisive-study approach and propose reviews around a specific research question that starts by reporting the main effects, then reports special circumstances that affect outcomes, and finishes by reporting special effects on particular types of people. This integrated research strategy is especially appropriate for reviews of research on television effects.

11.2.2 Evolution and Characteristics of the Technologies

The evolution of the technologies of motion pictures and television during the latter part of the 19th century and early 20th century can be described in terms of media characteristics, delivery systems, and communication functions. It is also important to know the terminology essential to understanding research descriptions and comparisons. This terminology is given in the glossary at the end of this chapter.

11.2.2.1. Functional Characteristics. These media characteristics of film and television are primarily realism or fidelity, mass access, referability, and, in some cases, imme-

diacy. Producers for both of these technologies wanted to make persons, places, objects, or events more realistic to the viewer or listener. The intent was to ensure that the realistic representation of the thing or event was as accurate as possible (i.e., fidelity). The ability to transmit sounds or images to general audiences, or even to present such information to large groups in theaters, greatly expanded access to realistic presentations. In the case of television, the characteristic of immediacy allowed the audience to experience the representation of the thing or event almost simultaneously with its occurrence. The notion of “being there” was a further addition to the concept of realism. As these various forms of media developed, the ability to record the representations for later reference became an important characteristic. Viewers could not only replay events previously recorded but could also refer to specific aspects or segments of the recording time and time again for study and analysis. Each of these characteristics has driven or directed the use of film or television for instructional purposes.

11.2.2.2. Delivery Systems. The State University of Iowa began the first educational television* broadcasts in 1933. Educational broadcasting quickly grew, with several universities producing regular programming and commercial stations broadcasting educational materials for the general population. During the 1950s and 60s, other technical innovations emerged that expanded the flexibility and delivery of educational television. These included the development in 1956 of magnetic videotape* and videotape recorders, the advent of communications satellites* in 1962, and the widespread growth of cable television in the 1960s and 70s. Delivery systems encompass both transmission and storage capabilities. The various means whereby the message* is sent to the intended audience differ in terms of the breadth of the population who can access the message. These means of transmission include broadcast television,* communications satellite, closed-circuit television* (CCTV), cable access television* (CATV), and microwave relay links.*

Broadcast television programming is generally produced for large-scale audiences by major networks and, with the exception of cable or microwave relay agreements, can be received free of charge by any viewer with a receiver capable of receiving the signal. Satellite communication has the capability of distributing the television signal over most of the populated globe. Closed-circuit television is produced for limited audiences and for specified educational purposes. Cable television often presents programming produced by public television organizations, public service agencies, or educational institutions for educational purposes. Today, many of the microwave relay functions have been replaced by satellite relays; however, this transmission medium is still used to distribute closed-circuit programming within prescribed areas such as school districts.

11.2.2.3. Storage Media. In the beginning, television productions were often stored in the form of kinescopes,* which

are rarely, if ever, used today, although some early television recording may still exist in kinescope form. Today, most video programs are stored on videotape cassette format, which is convenient and is produced in a variety of tape widths. Videotape permits a large number of replays; however, it can deteriorate after excessive use.

11.2.2.4. Communications Functions. From an instructional point of view, the most important factor in the development of any of these technologies is not the technical aspect of their development but rather the impact of the medium on the audience. Terms that relate to communications functions include instructional television (ITV), educational television (ETV), mass media, incidental learning, and intentional learning. Today, ITV programming is often transmitted by satellite to a school where it is either recorded and used when convenient or used immediately and interactively through a combination of computers and telecommunications. Educational television programming is typically not part of a specific course of study and may be directed to large and diverse groups of individuals desiring general information or informal instruction.

The distinction between mass media and educational television is frequently difficult to make since most educational television programming is distributed via broadcast television, the primary mass-media mode. What differentiates mass media from educational television is the notion of intended purpose. With educational television, intentional effects are achieved through purposeful intervention to achieve educational objectives. Incidental effects, on the other hand, typically result from mass-media or entertainment-oriented programming.

11.2.3 Legislative Milestones

The history of research on television effects has been tied to important government policy actions (Wood & Wylie, 1977). In the 1930s the government declared air channels to be public property and created the Federal Communications Commission (FCC) to regulate systems such as radio. After lengthy hearings, in 1952 the Federal Communications Commission reserved 242 television channels for noncommercial, educational broadcasting.

11.2.3.1. The 1950s and 60s. The first congressional hearings on violence and television occurred in 1952. In 1954, hearings were held to investigate the link between television and juvenile crime. When he was doing his Bobo doll social-psychology experiments in the early 1960s, Albert Bandura published an article in *Look* magazine entitled “What Television Violence Can Do to Your Child.” This article popularized the term “TV violence.”

In 1964, Newton Minow assumed the chair of the FCC. He would prove to be a strong commissioner, remembered for his statement that television was “a vast wasteland.” By 1965, advertisers had discovered that they could reach young

children with advertisements for toys, candy, and cereal more cheaply and effectively on Saturday mornings than in prime time. Also in the 1960s, Congress created the Public Broadcasting System (PBS) and the Corporation for Public Broadcasting (CPB). By the end of the 1960s, the National Commission on the Causes and Prevention of Violence had issued a report stating that exposure to violence on television increased rates of physical aggression.* This led to the Surgeon General's appointing a committee to study the effects television programs have on children. The decade concluded by the Supreme Court's upholding the fairness doctrine, which required stations to give equal time to political candidates.

11.2.3.2. The 1970s. The decade of the 1970s started with a ban on cigarette advertising on television, which had been initiated after the Surgeon General's report that there was a relationship between cancer and smoking. In 1972, the Surgeon General issued a report on violence that alleged that there was also a causal link between violent behavior and violence on television and in motion pictures. This first major government report on television and violence (NIMH, 1972) consisted of five volumes of reports and papers gathered through an inquiry process directed by the National Institute of Mental Health (NIMH). To prepare for this report, NIMH was empowered to solicit and fund a million dollars worth of research on the effects of television violence (Liebert & Sprafkin, 1988). By 1975, the FCC had received 25,000 complaints about violent or sexually oriented programs on television. As a consequence, in 1975 the Ford Foundation, the National Science Foundation, and the Markle Foundation cosponsored a major conference on television and human behavior. The Supreme Court ruled that the FCC could regulate hours in which "indecent" programming could be aired.

11.2.3.3. The 1980s. In 1982, the National Institute of Mental Health confirmed the link between television and aggression and stated that "violence on television does lead to aggressive behavior by children and teenagers who watch the programs" (NIMH, 1980, p. 6); thus television was labeled a cause of aggressive behavior. In 1985, the American Psychological Association (APA) publicly concluded that violence can cause aggressive behavior and urged broadcasters to reduce violence. As the decade ended, the FCC decided that the Fairness Doctrine was no longer necessary because there was no longer a scarcity of stations and that it was perhaps unconstitutional. Congress passed a bill to reinstitute the doctrine, but the President vetoed it. The President also vetoed legislation that would place limits on advertising during children's programs. In 1989, Congress passed the Television Violence Act granting television executives the authority to hold discussions on the issues of television violence without violating antitrust laws.

11.2.3.4. The 1990s. This brings us to the current decade, which started with Congress's passing the Children's

Television Act that requires limits on advertising and evidence that stations provide programming to meet children's needs. This is the first legislation to establish the principle that broadcasters have a social responsibility to their child audiences. The advantage of this approach is that it avoids the thorny issue of censorship. The bill became a law without presidential signature. Congress established the National Endowment for Children's Television to provide resources for production of quality children's programming as well as the Television Decoder Circuitry Act, which requires all new sets to have closed-caption capability. Over presidential veto, Congress approved the Cable Television Consumer Protection and Competition Act to regulate the cable industry. In 1993, the National Research Council of the National Academy of Sciences published a comprehensive report on the causes of violence in American society, entitled "Understanding and Preventing Violence," which addressed the role of television. The Senate Commerce Committee held hearings on television violence during which Senator Hollings complained that Congress has been holding hearings on television violence for 40 years. The idea of "V-chip" legislation to require the technology in all sets to block showing of programs rated violent was introduced at these hearings. The Telecommunications Act of 1996 required that this V-chip be installed on all new television sets. This landmark legislation had other important provisions, including one for discounted service rates for telecommunication lines into schools, especially for lines for compressed video and the Internet (Telecommunications Act of 1996). This overview of societal concerns about television documents the impetus for much research.

11.2.4 Historical Evolution of the Research

The first major research initiatives in both film and television began in the 1950s and 1960s, Research foci and variables of interest, as well as the social orientation of research, have changed considerably over the years.

Bowie (1986) reviewed research on learning from films and grouped the research into three phases:

1. Research on whether films can teach (1910—1950)
2. Research on how films teach (1940—1959)
3. Research on who learns from films (1960—1985)

Research from the last phase includes a great many experimental studies. The results of these experimental studies can be grouped in these areas: (a) use of films to teach higher-level cognitive skills, (b) effects of film viewing on individual learning, and (c) effects of film viewing on self-concept. Bowie concluded that the literature reviewed in these three areas suggests that:

- Films are effective in teaching inquiry learning and problem solving.
- Unstructured films are more effective for teaching problem solving.

- Films are effective in teaching observation skills and attention to detail.
- Low-aptitude students tend to benefit more from films.
- Films tend to be more effective for field-independent students.
- Films can positively influence self-concept.

Research on learning from films also served as a basis for research on instructional television.

Television research began with attention being devoted almost solely to its instructional effectiveness in formal instructional environments. The types and foci of research evolved into more varied agendas that considered not only the formal instructional implications of television but also the social, psychological, and instructional effects of broadcast television in less formal environments.

Sprafkin, Gadow, and Abelman (1992) describe the research on television as falling into three distinct chronological phases. The first of these they refer to as the “medium-orientation phase,” in which television was seen as a powerful instructional tool that required research to describe its effectiveness. At this point, little attention was devoted to assessing the interaction of the media with developmental or individual differences in the viewers. The second phase that Sprafkin et al. describe is the “child orientation phase,” in which research focused more closely on the relationship of television to young viewers’ individual characteristics and aptitudes. Media effects were thought to be due to a child’s mental-processing characteristics, not to programming. They termed the third phase the interaction phase, in which television effects were seen as complex three-way interactions between characteristics of the medium (such as type of content), the child or viewer variables (such as age), and factors in the viewing environment (such as parents and teachers). These three phases correspond approximately to the three eras of film and television research: the period of comparative media research (see 39.5.4) during the 1950s and early 1960s (Greenhill, 1967); the media effects and individual differences research of the late 1960s through the 1970s (Anderson & Levin, 1976; Wright & Huston, 1983); and the interaction research characterized by the work of Salomon (1979, 1983) during the later 1970s through the present time.

The purpose of this section is to chronicle the evolution of these research trends and describe the nature of the research associated with each phase. In doing so, we will attempt to relate the trends to methodologies and variables.

11.2.4.1. Research Prior to 1965. Before the mid-1950s, the vast majority of research was focused on the effects of instructional films,* usually in controlled educational or training environments, both in formal education and in military and industrial training. This period was marked primarily by the widely quoted Instructional Film Research Program conducted at the Pennsylvania State University. This program

was initiated under the auspices of the U.S. Naval Training Devices Center to study a variety of variables related to the use of instructional films for personnel-training purposes. One report issued through this research project summarized and evaluated over 200 film research studies from 1918 until 1950 (Hoban & Van Ormer, 1950). The major focus of the Instructional Film Research Program, however, was the conduct of an extensive series of experiments that compared instruction delivered via film with “conventional” or “face-to-face instruction.” Within these comparisons, researchers also investigated the effects of various production techniques, the effect of film-based instruction on learner attitudes, and the effectiveness of various applications of instructional films (Carpenter & Greenhill, 1956; Greenhill, 1967). This series of studies represents one of the first, and certainly most extensive, attempts to evaluate thoroughly the effectiveness of the medium. The findings of these studies, however, indicated no significant differences in most cases and have been criticized for a number of methodological procedures (Greenhill, 1967).

Typical among the studies conducted in this program were those that sought to compare the relative effectiveness of motion-picture—based instruction with conventional classroom instruction. A study by VanderMeer (1949) compared ninth-grade biology students taught by: (1) sound films, (2) sound films plus study guides, and (3) standard lecture-demonstration classroom instruction. No significant differences were found across all groups on either immediate or three-month-delayed achievement testing, although the film-only group showed a shorter completion time. This study is quite characteristic of most of these film studies in that no significant differences were found across both the experimental and control groups. Other studies focused on the relative effectiveness of instructional films for teaching performance skills and generally found no significant difference or only slight benefit from the film treatment (Greenhill, 1967). The effects of production variables were also of interest to researchers, and the relative effects of such variables as inserted questions, variants in the sound track, color versus monochrome, animation versus still pictures, and the use of attention-gaining and directing devices were all studied, albeit with few, if any, significant differences across groups.

The period between the mid- 1950s and the mid- 1960s was characterized by a great deal of instructional television research by a group of researchers at the Pennsylvania State University, reconstituted as the Instructional Television Research Project (Carpenter & Greenhill, 1955), as well as by other individuals (Hagerstown Board of Education, 1959; Holmes, 1959; Kumata, 1956; Niven, 1958; Schramm, 1962). These projects and summaries of research included literally hundreds of studies covering many content areas and many different age groups. In most cases, the summary reports issued by these researchers or projects provided fairly comprehensive descriptions of the general findings and conclusions. As with the film research initiatives, the television re-

search projects focused strongly on comparative research designs and similarly resulted in “no significant differences.” Few studies reported findings entirely supportive of television, and conversely few found television instruction to be less effective than conventional classroom instruction. The finding of no significant difference was seen by Greenhill (1967) as a positive result because it implied that television could be a reasonable alternative to classroom instruction and consequently, for reasons of administrative, fiscal, and logistical benefit, could be a more desirable choice of instructional method.

The comparative studies of television conducted during this time were later criticized on methodological grounds by Stickell (1963) and Greenhill (1967). Stickell analyzed 250 comparisons and determined that only 10 were “interpretable” methodologically. Those 10 had employed random assignment of subjects, control of extraneous variables, and application of appropriate tests of significance in which the underlying assumptions of the test were met. Of the studies Stickell found to be “interpretable,” none revealed significant differences.

The majority of these early comparative studies were designed to compare various forms of televised instruction to a vaguely specified standard known as “face-to-face instruction,” “conventional,” or “traditional classroom instruction” (Carpenter & Greenhill, 1956; Lumsdaine, 1963). Instructional techniques and formats included (a) a single instructor teaching the same content, (b) a “live instructor” teaching a class while the same class was being televised to a remote class, (c) a number of different instructors teaching the same general lesson as the televised lesson, and (d) kinescope recordings of a lesson augmented by various, instructor-led activities. In most cases, there was little or no means of equating the instructional formats being used in terms of instructor equivalence, content congruence, or environmental similarity (Greenhill, 1967; Wilkinson, 1980; Williams, Paul & Ogilvie, 1957). Among the large number of comparative studies, there are many that simply compared the medium with some standard of live classroom instruction, while a smaller proportion made comparisons with the audio message only, comparisons of film versus kinescope, and television versus an in-studio classroom (Kumata, 1956).

As mentioned, this matter was further complicated by the fact that the vast majority of the studies, in both film and television, produced results of “no significant difference” (Greenhill, 1967; Stickell, 1963). This finding, when considered in conjunction with the general comparative nature of the research, makes it difficult to draw specific conclusions or recommendations from most of these comparative studies. Other methodological problems also plagued this early research, including: lack of equivalence of experimental groups, confounding of variables, and statistical analysis procedures that were not powerful enough to detect differences that may have been present (Greenhill, 1967).

In terms of group equivalence, two problems were apparent. First, groups were rarely pretested to determine if prerequisite knowledge was approximately equivalent. Second, little attention was given to ensuring equivalence of assignment to experimental groups. In some cases, correlative data such as IQ scores or grade point averages were used as matching variables, but because of the use of intact classes, randomization was rarely employed to assign subjects (Chu & Schramm, 1968; Stickell, 1963). Because the variables of televised instruction and conventional instruction were not clearly defined, it was almost impossible to separate other mediating variables related to production methods, technologies, viewing and teaching environments, viewer characteristics, and content organization. The result was often a serious confounding of many variables, only some of which were of interest. In terms of statistical analysis, *t* and *F* tests were used only occasionally, and analysis of covariance procedures were employed rarely because adjusting variables were infrequently assessed (Stickell, 1963). Additionally, content-related factors and objectives as well as types of learning were often not addressed or confounded (Miller, 1968).

Other more carefully defined variables continued to be investigated during this time, including: technical or production variables such as color, camera techniques, and attention-gaining and directing devices (Ellery, 1959; Harris, 1962; Kanner & Rosenstein, 1960; Schwarzwald, 1960); pedagogical variables, such as inserted questions and presentation modes (Gropper & Lumsdaine, 1961; Rock, Duva & Murray, 1951); and variables in the viewing environment, such as viewing angle, group size, and distractions (Carpenter & Greenhill, 1958; Hayman, 1963; McGrane & Baron, 1959). In addition, attitudes toward televised instruction and the use of television to teach procedural skills were studied (Hardaway, Beymer & Engbretson, 1963; Pasewark, 1956).

Later studies, conducted during the 1960s and early 1970s, focused more specifically on individual variables, media characteristics, and the interaction between viewer characteristics and television effects. These studies typically employed the aptitude-treatment-interaction paradigm (see 22.3.3 to 22.2.7) described by Cronbach and Snow (1976) and were intended to explore specific effects of television on particular individuals. These designs were inherently more precise and more powerful and consequently enabled researchers to identify the effects of individual variables as well as the interaction of variables and other factors (Levie & Dickie, 1973).

During this time period, studies employed quantitative experimental methods almost exclusively to evaluate the relative effectiveness of film and televised instruction in generally controlled environments such as laboratories, studios, classrooms, and schools. Researchers did not have the resources or research interest to investigate or describe specific effects on larger or noncontrolled populations, such as the effect of incidental learning resulting from noneducational broadcast television.

11.2.4.2. Research from 1965 On. After 1965, research focus was increasingly directed toward mass media and social effects. The formation of Children's Television Workshop (CTW) in the late 1960s directed research interest to formal features and formative evaluation (Polsky, 1974). The 1970s were also devoted to research on the relationship between televised violence and aggression. With the 1980s, a change from the behavioral to cognitive paradigm in psychology stimulated further research on mental processing (see 5.4.1 to 5.4.4) and formal features. Some research questions have persisted from the 1960s until the present, such as effect on school achievement and aggression. Research evolved from a focus on specifying variables to describing the relationships and interactions among variables. More-varied research agendas have considered not only the formal instructional implications of television but also the social, psychological, and instructional effects of broadcast television in various, less-formal environments (Comstock & Paik, 1987; Huston et al., 1992).

11.2.5 Methodological Approaches

Historically, research on television has employed four methodologies: experimental, qualitative, descriptive, and developmental (see Chapters 39 to 42). There has been a general chronological correspondence between certain methodologies and research foci, for example, between comparative studies and instructional effectiveness and between correlational studies and school achievement. For this reason, it is important to understand that research related to television has, over the years, come to address more than simply the effects of televised instruction on learning. Evolving societal demands brought about the need for different methodological approaches to study the disparate effects of television on types of viewers, on variations in viewing environments, on socialization effects, and on interaction with programming variables (Cambre, 1987). Such a broad base of research agendas has necessitated reliance on research methodologies other than those of a traditional empirical nature.

The vast majority of current television research reflects these four methodological approaches: experimental, qualitative, descriptive, and developmental. This section deals with these various research methodologies with regard to their purposes, strengths, and weaknesses as they apply to film and television research.

11.2.5.1. Experimental Methodology. Early research in television effects utilized traditional experimental designs (see Chapter 39), albeit with different levels of robustness and precision. The era of film and television research conducted during the 1940s through the mid-1960s, which has been referred to as the period of comparative research studies (see 39.5.4) generally used traditional experimental designs, such as those described by Campbell and Stanley (1963). Although many of these studies were methodologically weak in that they did not employ randomization of

groups, pretests, or control groups, and have been subsequently criticized for these reasons (Greenhill, 1967; Stickell, 1963), it is important to note that there were many methodologically rigorous studies conducted during this period which continue to provide useful insights, not only into the comparative effects of television and traditional classroom instruction but also into the effects of specific variables, such as color, inserted questions, and presentation techniques (Greenhill, 1967; Reid & MacLennan, 1967). During the period of time from the mid-1960s through the 1970s, other empirical studies were prompted by (a) better design conceptualization such as the aptitude treatment interaction paradigm, (b) more robust statistical analysis techniques, and (c) greater attention to the individual characteristics of the medium, the child, and the viewing environment. Increasingly, research moved from the laboratory or classroom to the home and social environment. Two types of experimental studies that compare variables are common in research on television: laboratory and field experiments. The former has advantages when comparing theories, testing hypotheses, and measuring effects; the latter is suited to checking the results of laboratory experiments in real-life settings (Comstock, 1980). An example of a laboratory experiment would be three treatments (i.e., violent first segment, violent last segment, and nonviolent segment) given to three randomly assigned groups who are given written instruments assessing recall.* An example of a field experiment would be randomly assigning children to watch specific television shows at home and then administering attitude surveys and comprehension measures,

The major advantage of the laboratory experiment is that random assignment of subjects to specific treatment conditions can control for the effect of other variables. The disadvantage is that there is no certainty that the setting is realistic. The major disadvantage of the field experiment is that it produces little consistent evidence because control of variables is less rigorous. Nevertheless, one can be more confident in how realistic the findings are with a field experiment; however, realism and validity are gained at the expense of control of variables and the possibility of drawing causal conclusions. Laboratory research, on the other hand, generally allows one to draw cause-effect conclusions about interactions.

11.2.5.2. Qualitative Methodology. Qualitative research methodology (see Chapter 40) includes approaches that typically use nonexperimental methods, such as ethnography or case studies, to investigate important variables that are not easily manipulated or controlled and which emphasize the use of multiple methods for collecting, recording, and analyzing data (Seels & Richey, 1994). Although case histories have been used frequently in television research, ethnographic studies are becoming more common. The trend towards qualitative research emerged after new research questions began to be asked about the mediating effect of the home context for television viewing (Leichter et al., 1985).

Often with qualitative research, the purpose is hypothesis generating rather than hypothesis testing. Unlike survey methodology, qualitative research cannot present a broad picture because it concentrates on single subjects or groups, although longitudinal studies can describe how groups or individuals change over time. There is no attempt at representative sampling as in survey research. Examples of case studies abound in literature on early ITV and ETV projects. Ethnographic studies have been conducted by photographing or videotaping the home environment, which mediates television viewing (Allen, 1965; Lewis, 1993). An example of a recent ethnographic study on learning from television is the Ghostwriter study conducted by CTW (Children's Television Workshop, October 1994). Ghostwriter is an after-school literacy* program that encompasses a mix of media including television and utilizes outreach programs with community organizations. Ethnographic techniques were used to gather data on wide variations in observed phenomena in disparate settings. For example, case studies were done at Boys' and Girls' Clubs in Los Angeles and Indianapolis and at Bethune Family Learning Circle in Baltimore.

11.2.5.3. Descriptive Methodology. Studies in this category (see Chapter 41) include survey research such as demographic, cross-cultural, and longitudinal, in addition to content and meta-analyses.* The common denominator among such studies is the use of survey techniques for the purpose of reporting characteristics of populations or samples.

Survey research uses samples of group populations to study sociological and psychological variables. To do this, data can be collected by personal or telephone interview, questionnaires, panels, and structured observation. Demographic research uses facts and figures collected by others, such as the census bureau or television information offices. Cross-cultural studies based on surveys use factual data about groups to draw generalizations.

There are many longitudinal* and cross-sectional* studies in the body of literature on learning from television. Sometimes these are based on qualitative research, sometimes on quantitative research, and sometimes on both. The longitudinal method can reveal links between earlier and later behavior and changes in individuals over time, but the changes may be the result of many factors not just developmental maturation. Cross-sectional studies can demonstrate age differences in behavior by observing people of different ages at one point in time. They provide information about change over time in cohort groups but not change in individuals. A sequential* method combines the cross-sectional and longitudinal approaches by observing different groups on multiple occasions. Obviously, the more variables are controlled in each of these methods, the more reliably results can be interpreted. If there is not sufficient control of variables, the results from a cross-sectional study can conflict with the results of a longitudinal study. The longitudinal method is more extensively used, perhaps because it is easier and less expensive.

Parallel longitudinal studies in Australia, Finland, Israel, Poland, and the United States (Heusman & Eron, 1986, cited in Huston et al., 1992) revealed a pattern of involvement with violence related to amount of television viewing. The amount of violence viewed at age 8 predicted aggression at age 18 and serious criminal behavior at age 30. Because this was a relational study, however, it could not be determined whether more violence was viewed because of the viewer's personality or whether violent programming affected the viewer through desensitization* or some other mechanism (Eron, 1982; Huesmann, Eron, Lefkowitz & Walder, 1984, cited in Huston et al., 1992). Milesky, Kessler, Stripp, and Reubens (1982) conducted a similar study and concluded that other research did not support the hypothesis. On the other hand, methodology experts who examined other studies supported the hypothesis on violence and aggression (Cook, Kendzenky & Thomas, 1983, cited in Huston et al., 1992).

Content analyses are used to determine variables such as (1) the number of violent, anti- or prosocial incidents in a program; (2) characteristics of roles* given ethnic groups, gender, age, or occupations portrayed; and (3) values presented on television, such as in commercials. Meta-analyses, which use statistical techniques for synthesis of the literature, and integrated research studies, which use comprehensive surveys and graphic comparison of the literature, are used to draw conclusions from multiple studies on a research question.

11.2.5.4. Developmental Methodology. Formative evaluation as a research methodology (see Chapter 42) developed in response to a need for procedures to systematically try out and revise materials during a product development process (Cambre, 1987). It is one of the major contributions of television research. According to Flagg (1990), "The goal of formative evaluation is to inform the decision-making process during the design, production, and implementation stages of an educational program with the purpose of improving the program" (p. 241). The techniques used in formative evaluation of television programs are important areas of competency for instructional technologists. Formative evaluation studies pose research questions rather than hypotheses, and techniques employed range from oral reports and videotaping reactions to short questionnaires. Evaluation models incorporate phases, such as pre- and postproduction, in the research process.

An example of formative evaluation studies on television is the AIT report on the development of a lesson in the form of a program entitled "Taxes Influence Behavior" (Agency for Instructional Television, 1984). Students were questioned about attention to the program, interest, story believability, character perceptions, storyline comprehension, and program objectives. Teachers were asked about the program's appeal, curriculum fit, objectives, and utilization. Revisions and recommendations for teachers were based on the data collected.

It was Children's Television Workshop (CTW) that pioneered techniques for formative and summative evaluation* (Flagg, 1990). After specifying message design variables and then investigating the effect of these variables on psychological phenomena such as attention, CTW developed techniques for investigating relationships formatively, so that designs could be changed, and summatively, so that effects on behavior could be reported. In doing so, CTW forever put to rest the assumption that one style of television is best for all young children (Lesser, 1974) and the assumption that television was not an interactive enough medium to teach intellectual skills to young children.

Periodic bibliographies issued by CTW document not only the research done there but also research related to CTW productions. Sammur (1990) developed a "Selected Bibliography of Research on Programming at the Children's Television Workshop" that annotated 36 formative, summative, and theoretical research studies on the four educational children's television series produced by CTW. The CTW research program reflects the systematic application of design, development, and evaluation procedures that is necessitated by the expense of producing for sophisticated educational technologies.

11.2.6 Summary

Film research during the 1950s contributed an identification of variables, especially variables related to message design. However, much of this research was methodologically flawed. Therefore, today it is useful primarily for the model it set for television research and the variables it identified. During the 1960s, television research emphasized comparative studies and frequently focused on message design variables,

The 1970s were a period of transition in that there was a move from ITV to ETV research, and a move from comparative studies to the study of specific variables and effects via the aptitude treatment interaction paradigm. There was also a methodological shift to qualitative, descriptive, and developmental studies in addition to traditional empirical studies,

During the 1980s and 90s variables began to be categorized into a viewing system consisting of programming, environment, and behavior, all of which interrelated. We turn now from a chronological consideration of the historical context of film and television research to findings in the major areas of interest to researchers,

11.3 MESSAGE DESIGN AND COGNITIVE PROCESSING

The vast majority of early instructional films and television programs were essentially documentary works that were developed by commercial, noneducational producers. At this early point in the evolution of instructional technology, little attention was given to the use of instructional techniques or

design principles. Similarly, the technology of film or television was still in its infancy, and few, if any, editing or special visual effects were available to the producers of such materials. In light of this, it is not surprising that most of the earlier research focused on simple comparisons between the technology and some form of standard instruction. Since the two technologies did not incorporate many of the production elements that have become part of their unique symbol system as we understand them today, little attention was given to assessing the effects of specific media characteristics on student learning.

11.3.1 The Evolution of Message Design

During the period of the Pennsylvania State University film studies, however, some research was directed at determining how the intentional incorporation of instructional techniques and media characteristics interacted with learner achievement from the materials. The variables studied included: the use of inserted questions, color, subjective camera angle, sound track modifications, and the use of visual cueing devices (Greenhill, 1956; Hoban & van Ormer, 1951). Similar studies were further conducted on instructional television in the late 1950s and early 1960s, generally on adult audiences in controlled environments (Chu & Schramm, 1967; Greenhill, 1967). From this time on, a growing number of researchers have investigated, in increasingly greater levels of detail, the instructional effectiveness of television productions incorporating specialized features that are intended to facilitate learning. The process of specifying and organizing these components has come to be called message design (see 26.1).

Fleming and Levie (1993) define an instructional message as "a pattern of signs (words, pictures, gestures) produced for the purpose of modifying the psychomotor, cognitive, or affective behavior of one or more persons" (p. x). Grabowski (1991) describes message design as "planning for the manipulation of the physical form of the message" (p. 206). The concept of message design was not used in the literature until the 1970s, although the general principles of message design were being synthesized from research on perception, psychology, and instruction. Early researchers focused primarily on visual perception (Norberg, 1962, 1966; Knowlton, 1966; Fleming, 1967); however, later researchers addressed auditory and print media as well. Fleming and Levie (1978, 1993) first defined the term message design and comprehensively articulated its general principles for instructional designers. Today, the concept of message design in television includes all of the scripting, production, and editing decisions that are made separate from the actual content of the program.

The design of the instructional television message (see 11.7.3.4) has become increasingly important as a greater understanding of instructional and cognitive principles has emerged from the study of learning and psychology, and with the growing sophistication of television production technol-

ogy, particularly in broadcast television. The intentional use of various video effects such as zooms, cuts, dissolves, and the designer's manipulation of program pacing and use of various audio and graphic effects became a standard procedure among instructional designers wishing to maximize the effectiveness of television programming. For the most part, however, these production effects* were not systematically investigated, and, consequently, the television producer had few reliable research guidelines on which to base production decisions.

During the mid-1970s, Aletha Huston and John Wright used the term formal features to collectively describe the various production techniques employed in designing and producing the television message (Huston & Wright, 1983). They describe television as being distinguished by its unique forms, rather than simply by the content of the programming. These researchers and their associates at the University of Kansas began a systematic investigation of the formal attributes* or features of television, particularly with respect to how these techniques interact with cognitive processes, such as attention and comprehension (Rice, Huston & Wright, 1982).

By the late 1970s, much of the television research focused on how children view television and those processes that relate to attention and comprehension of the televised information. This era of research can be best characterized as the conjunction of interest in both the developmental aspects of learning and in cognitive processing of information. Two events in the area of children's television prompted this research: the initial success of *Sesame Street* and associated programming by the Children's Television Workshop (Mielke, 1990), and the increased criticism of television and its alleged negative effects by a number of popular writers (Mander, 1978; Postman, 1982; Winn, 1977).

With the advent of *The Children's Television Workshop* and *Sesame Street*, a number of researchers began to explore the value of using many of these production techniques. These studies were typically formative in nature, intended for in-house use to assess the adequacy of particular techniques, and consequently did not appear regularly in the research literature (Sammur, 1990). Thus, researchers began to focus on those unique features that promote children's attention and comprehension during television viewing. In this research, the cognitive effects of formal features such as pacing, audio cues, camera effects, animation, and editing techniques were also explored with regard to the role that they played in attention and comprehension (Meyer, 1983).

During this time, public interest was also drawn to the possible negative effects of television programming on children. In addition to the continuing public concern for the effects of television violence on children, interest increased into the possibly debilitating effects on children's cognitive-processing abilities. In her book, *The Plug-in Drug*, Winn (1977) charged that television and the formal features inher-

ent in the programming were causing excessive cognitive passivity* and depressed processing capabilities,*

Organized research, which was prompted by these events and criticisms, investigated the general effects on both attention and comprehension, as well as on the specific effects of television's formal production features in a fairly comprehensive manner. Such research has given us a remarkably thorough understanding of how television promotes cognitive activities (Anderson & Collins, 1988).

As interest in the cognitive aspects of children's television grew, hypotheses were developed to account for these effects in a broad manner, irrespective of particular types of programming. While a number of these theoretical perspectives are unconfirmed, they have provided the impetus and base for substantial, systematic research,

11.3.2 The Effects of Television on Cognitive-Processing Abilities

Television has been both lauded and criticized for the ways in which it presents information to the viewer, irrespective of the information itself (Anderson & Collins, 1988). It is this area, that of the relationship between the ways in which information is presented on television and the effect of that presentation on the cognitive-processing abilities of the viewer, which has continued to attract a great deal of theoretical as well as supporting research interest (Huston et al., 1992).

11.3.2.1. Theoretical Orientations. One critical view that has persisted over the years, despite contrary research findings, is that the television image and associated presentation effects are cognitively debilitating (Mander, 1978; Winn, 1977). The central assertion of this viewpoint is that the rapidly changing television image—enhanced by production features such as cuts, zooms, animation, and special effects—is cognitively mesmerizing. This is hypothesized to result in cognitive passivity, shortened attention spans, and, paradoxically enough, hyperactive behavior (Winn, 1977; Dumont, 1976, cited in Winn, 1977). Such a view is more conjecture than substantiated fact or articulated theory and has been drawn substantially from subjective observation rather than from extensive empirical research. The notion, however, has appealed to many who associate these behavioral manifestations with general, adult entertainment forms of television and who are more critical of the content of television programming rather than the presentation formats. It should be noted that most researchers in the area of cognitive science and educational technology have not supported these assertions, which remain, to a large degree, open to definitive and methodologically rigorous research (Anderson & Collins, 1988).

11.3.2.2. Empirical Research. For the most part, research related to this aspect of television effects has been drawn from studies done in the area of advertising and marketing

or in electroencephalography (EEG). Krugman (1970, 1971) compared the EEGs of subjects viewing rear-projected visual images and those of subjects reading, and concluded that television viewing resulted in different brain wave patterns than did reading. It is important to note that these studies were conducted on a single subject and only used the subject's EEG obtained while browsing a magazine as a baseline index. The length of time the EEG was recorded was also only 15 minutes, and readings were taken at only one location on the head. The two brain wave patterns of interest were the alpha rhythm, which is associated with an inactive or resting-brain state, and the beta rhythm, which is usually indicative of cognitive activity. These experiments were repeated by Krugman, using actual television images with similar results (Krugman, 1979). Similar findings were produced by several other researchers who indicated that television viewing produced more alpha activity than reading, which resulted in greater beta activity (Appel, Weinstein & Weinstein, 1979; Fetherman, Frieser, Greenspun, Harris, Schulman & Crown, 1979; Walker, 1980; Weinstein, Appel & Weinstein, 1980). In these cases, alpha activity was associated with periods of low cognitive activity, which was interpreted to be the mesmerizing effect described by critics.

Drawing from the work of Krugman (1979), Emery and Emery (1975, 1980) criticized television images as "habituating" because the continuously scanned image emitted an overload of light-based information, potentially resulting in an overload of the processing system. This claim was substantially refuted, however, in studies by Silberstein, Agardy, Ong, and Heath (1983), who, in methodologically rigorous experiments with 12-year-old children, found no differences in brain wave activity between projected text and text presented on the television screen. Furthermore, differences were found between text presented on the television screen and documentary or interview programming; whereas no differences were found between the two types of programming. A third interesting finding was that both the text and interview program produced right- and left-hemisphere effects, while the documentary alone resulted in greater right-hemisphere activity. A comprehensive and critical review of most of the EEG research was published by Fite (1994). In this report, Fite found virtually no substantiation of the detrimental effects of television evidenced by EEG-based studies.

Focusing specifically on viewer attention, Rothschild, Thorson, Reeves, Hirsch, and Goldstein (1986) found that alpha activity dropped immediately following the introduction of a scene change or formal feature in the program material, which in these studies were commercial advertisements. Winn (1977) has further criticized children's television and Sesame Street, in particular, for contributing to shortened attention spans and hyperactive behavior. A study by Halpern (1975) has been frequently cited as providing evidence that programming such as Sesame Street contributed to hyperactive and compulsive behavior. This study has been seriously criticized on methodological grounds by Anderson and Collins (1988), and the findings have not been suc-

cessfully replicated by Halpern. Other studies related to children's concentration and tolerance for delay reported moderate decreases in tolerance for delay associated with action programs (Friedrich & Stein, 1973) and actually increased concentration resulting from television viewing among children rated as low in imagination (Tower, Singer, Singer & Biggs, 1979). Anderson, Levin, and Lorch (1977) investigated the effect of program pacing on attention, activity, and impulsivity levels and found no differences in 5-year-old children's degree of activity, impulsivity, or perseverance levels. Salomon (1979), however, found that Sesame Street viewing, when compared to other general types of children's programming, produced a decrease in perseverance in a laboratory task. This effect may have been related to differences in the audience's age and the intended target age of the Sesame Street programming and the relative ease of the task.

11.3.3 The Television Symbol System or Code

For the most part, research into the cognitive effects of television has focused more specifically on how televised information is processed rather than on how television affects cognitive processing abilities (Anderson & Collins, 1988). This research is based on theory related to both the symbol system or formal features used in television and the ways that information is attended to and comprehended (see 26.4.3).

11.3.3.1. The Role of Filmic Codes in Processing. One of the most universal views of television as a medium was described by McLuhan (1964) when he suggested that the formal attributes of a medium, such as television, influence how we think and process information. Furthermore, McLuhan put forth the idea that different media present information in unique ways that are idiosyncratic to the individual medium. Goodman (1968) and Gardner, Howard, and Perkins (1974) further elaborated on the function of such symbol systems,* implying that similarities between the symbol system and mental representations of the content will facilitate comprehension of the instructional message. More recently, Kozma (1991) suggests that different media are defined by three characteristics: the technology,* the symbol systems employed, and the methods of processing information. Of these, the symbol system is crucial to the mental processing of the person interacting with the medium. The individual symbol systems may be idiosyncratic to the particular medium and consequently may need to be learned by the user. This thesis has been elaborated on by Gavriel Salomon, who has attempted to test it empirically with regard to television (Salomon, 1972, 1974; Salomon, 1979; Salomon & Cohen, 1977). He suggested that different symbol systems or codes can represent information in different ways during encoding in memory, making it necessary to process the information in unique ways. Salomon contended that children learn to interpret these "filmic codes,"* which can be incorporated into cognitive activities in two ways (Salomon, 1979). The first function of symbolic or filmic

codes is that they can call on or activate cognitive skills within the learner and can become internalized into the learner's repertoire of processing skills (Salomon & Cohen, 1977). In this way, such production features as montage* or cuts can activate respective cognitive processes such as inferencing and sequencing. The second role of filmic codes lies in the assumption that these codes, which model cognitive processes, can actually "stand in" for or "supplant" the cognitive skills themselves, thereby facilitating learning (Salomon, 1974). In this manner, features such as zooms and dissolves can be used to model the cognitive skills they represent and consequently enhance the processing skills of the viewer.

Rice, Huston, and Wright (1983) further differentiated the types of representation within the television code into three levels. These include at the most basic level, literal visual or auditory portrayal of real-world information. At the second level are media forms and conventions that have no real-world counterpart, such as production effects and formal features. The third level consists of symbolic code that is not distinctive to the television medium. These third-level codes consist of linguistic, nonlinguistic, and auditory code such as language, which may be used to "double encode" or describe the visual codes presented on the screen. Of the three, the media forms and conventions are of most interest to the researcher because they are idiosyncratic to the media of television and film and relate most specifically to the child's processing of the television message (Rice, Huston & Wright, 1983).

11.3.3.2. Research on Filmic Codes. There is not a great deal of empirical work related to the cognitive effects of television code. However, the work of Gavriel Salomon constitutes the most comprehensive series of empirical studies focused on the symbol system and code of television. Drawing on his theoretical position, he devised a series of experiments that explored the use of filmic codes to both model or supplant cognitive skills and to call on or activate specific cognitive skills. He conducted the first group of studies with Israeli eighth-graders to determine if the camera effect of zooming could indeed model the relation of the part to the whole (Salomon, 1974). The results indicated that the children exposed to the experimental treatment performed significantly better than did those students either shown the individual close-up and overall pictures or those receiving no treatment. In this case, the use of explicit modeling of the cognitive skill improved the student's ability to focus attention on the detailed parts of the overall display. A second experiment, using fewer visual transformations, was not as effective as the first, possibly indicating that extensive modeling of these skills is necessary for this effect to occur. In a third experiment, Salomon confirmed that the internalization of the filmic codes could enhance the cognitive skills of the viewer by presenting scenes where the three-dimensional unfolding of an object was compared with the same representation in two dimensions. In this case, the three-dimensional animation effect modeled the cognitive analog of mentally unfolding the object from three dimensions to two

dimensions more effectively than did simple presentation of the two-dimensional object. A study conducted by Rovet (1983) using a spatial rotation task with third-grade children further confirmed Salomon's findings, although conclusive confirmation of this theory has not been provided through research.

The second assertion made by Salomon suggested that filmic codes could also activate or "call upon" specific cognitive skills. In a series of studies, Salomon (1979) tested this hypothesis on groups of preschool, second-grade, and third-grade Israeli students using Sesame Street programming as the content. After 6 months, the groups of school-aged children demonstrated significantly higher comprehension scores. This was interpreted by Salomon to indicate that students were able to learn the meanings of the filmic codes, and in so doing activated the respective cognitive skills. However, the effects were limited to the older children and have been qualified by Salomon to suggest that these mental skills can be activated by the appropriate filmic codes, but are not necessarily always activated in this manner.

11.3.4 Children's Attention to Television

The effect of the television symbol system on learning has been addressed through two areas of cognitive processing: attention and comprehension. For each of these areas, we discuss theoretical approaches and empirical research.

11.3.4.1. Reactive/Active Theory. Two approaches to understanding the way in which children attend to television have emerged. These positions include the reactive theory,* which generally views the child as passive and simply a receptor of information or stimuli delivered by the television, and the active theory,* which suggests that children cognitively interact with the information being presented as well as with the viewing environment (Anderson & Lorch, 1983). These two viewpoints generally parallel theoretical orientations to human information processing in that early concepts of the human information-processing system were reasonably linear and viewed attention as a relatively receptive process where the learner merely reacted to stimuli that were perceived (Atkinson & Shiffrin, 1968). Later conceptions of how we process information took the position that we are active participants in selecting and processing incoming stimuli (Anderson, 1980).

The first theoretical orientation, the reactive theory, is derived from Bandura's Social Learning Theory* (Bandura, 1977). In this conceptualization, the salient formal features of the television programming gain and maintain the viewer's attention. Continued attention and comprehension occur more or less automatically as the child's information-processing system functions reactively. Singer (1980) describes this process as one where the continually changing screen and auditory patterns create an ongoing series of orienting reflexes in the viewer. Key to this orientation is the role of the viewer as a passive, involuntary processor of information that is absorbed from the screen. The reactive theory of attention to

television is supported by little direct research, with most of the foundation for the theory being based on the early human information-processing theories such as those described by Atkinson and Shiffrin (1968, 1971), Broadbent (1959), and Neisser (1967). The work of Singer (1980) included little direct research relative to this perspective, but rather drew on what was, at that time, a popular theory of memory that described the human information-processing system as one in which information was processed in the sensory store, received further processing in short term memory, and was then transferred to long-term memory, all without a great deal of active or purposeful selection, processing, or coding by the learner,

It is generally accepted today that the reactive theory requires much revision, particularly with regard to the learner's role in initiating and actively processing new information in relation to prior knowledge. For these reasons, little substantiation of the theory can be put forth, especially in light of the support that current research provides to the opposing theory, the active theory.

The alternative theory, the active theory, defines the child as an active processor who is guided by previous knowledge, expectations, and schemata* (Anderson & Lorch, 1983). In this way, the child does not merely respond to the changing stimuli presented, but rather actively applies strategies based on previous experience with the content and formal features, personal knowledge structures, and available cognitive skills. Key to this view is the assumption that the child will apply existing schemas to the perception and processing of the televised information. Anderson and Lorch (1983) suggest that a number of premises underlie the functioning of the active theory. These include consideration of competing stimuli, the need to maintain a reasonable level of stimulus unfamiliarity, the role of auditory cues to refocus attention, and the effect of attentional inertia* to maintain cognitive involvement (Anderson, Alwitt, Lorch & Levin, 1979). Additionally, a key component of the active theory is the role of viewing schemata, which Anderson and Lorch suggest develop through increased interaction with television forms, as well as with general cognitive growth.

The notion of representational codes or formal features and their role and effects in the processing of television information has become an area of particular interest and the central focus of much research regarding how children attend to and process the television message. Formal features are defined by Anderson and Collins as characteristic attributes of the medium, which can be described without reference to specific content. In reality these include, but are not limited to, the visual features of zooms, camera movements, cuts and dissolves, montage techniques, animation, ellipses, program pace, and special visual effects, as well as the auditory features of music, sound effects, and unusual voices. A fairly comprehensive taxonomy of formal features has been developed by the research group at the Center for

Research on the Influence of Television on Children (CRITC) (Huston & Wright, 1983; Rice, Huston & Wright, 1983).

Two constructs related to the visual message and the forms of television have emerged and become important to an understanding of how these forms function in the processing of the television message. These constructs, which include visual complexity or the amount and degree of change of information (Watt & Welch, 1983; Welch & Watt, 1982) and perceptual salience* or those attributes of the stimulus that increase its intensity, contrast, change, or novelty (Berlyne, 1960; Rice, Huston & Wright, 1983), relate to both quantitative and qualitative characteristics of the message. Researchers associated with each of these positions have developed or adapted models that can be used to conceptualize the effects of these attributes on the message and how it is processed by the viewer. Watt and Welch employed an information theory model for entropy to explain the relationship between static and dynamic complexity and learning from television content (Watt & Welch, 1983; Welch & Watt, 1982). Rice, Huston, and Wright (1982) presented a model that described the relationship between attention and stimulus complexity. For the most part, however, the effects of the formal features of television have been considered with regard to the particular cognitive processes or skills with which they are associated, attention and comprehension, and consequently, they are best examined from that perspective.

11.3.4.2. Research on Attention. The variable of attention to the television program has received extensive research interest, of which the most comprehensive group of studies has been conducted by Daniel Anderson and his associates at the University of Massachusetts. This group of researchers was the first to propose that the process of attending to television programming was active rather than simply a reaction to the stimuli presented.

One of the first questions relative to attention to television is a qualification of exactly what attention is and how it can appropriately be measured. Anderson and Field (1983) describe five methodologies that may constitute an effective measure of this attention. These include: (a) visual orientation, the physical orientation of the viewer toward the television screen; (b) eye movements and fixations; (c) comprehension and recognition testing, which measures attention through inferences drawn from objective recognition and comprehension tests; (d) interference methods, which pinpoint attention as that time when a viewer responds to and removes some form of interfering information from the message; and (e) physiological measures that include cardiac, galvanic skin response, and electroencephalographic records of arousal. Of these, the most frequently employed have been visual orientation and the use of recognition and comprehension tests.

Anderson and Field (1983) identify a number of settings and contexts for viewing that impinge on the attentional process. They differentiate between the home-viewing environ-

ment and laboratory settings in terms of the accuracy of data obtained. Home viewing generally results in overly inflated estimates of attentional time (Bechtel, Achelpohl & Akers, 1972). The use of monitoring cameras revealed that attention does not continue for long periods of time but rather consists of frequent interruptions, conversations, distractions,* and the viewer's exits and returns to the room (Allen, 1965; Anderson, 1983). Allen used time-lapse movie cameras, and Bechtel, Achelpohl, and Akers videotaped in the home. The results of these studies appear consistent, indicating that children up to age 10 averaged about 52% of the time in the viewing room actually attending to the program, while children aged 11 to 19 years showed an average attention of about 69% (Bechtel et al., 1972). In all cases, attention to children's programs was substantially higher than to adult-level programming, although this may not remain true today because of changes in programming and the increased viewing sophistication of children. In laboratory settings, where more control over outside distractions could be maintained, it was found that children still were frequently distracted and demonstrated only sporadic attention to the program (Becker & Wolfe, 1960). In several studies, preschool children were observed to look at and away from the television 150 to 200 times per hour (Alwitt, Anderson, Lorch & Levin, 1980; Anderson & Levin, 1976; Field, 1983). The length of "looks" were also seen as important characteristics of attention. Anderson, Lorch, Smith, Bradford, and Levin (1981) found that looks of more than 30 seconds were infrequent and that the majority of look lengths were less than 5 seconds.

The viewing context was also identified as an influential factor in attention. Sproull (1973) suggested that toys and other activities were strong attention-diverting stimuli, in the absence of which attention rose to 80%. Studies by Lorch, Anderson, and Levin (1979) concluded that attention is strategic in children, because audio cues were used heavily to monitor program content and indicate instances when attention should be redirected to the television. The presence of other children with whom they could discuss the program and use as models of attention were also shown to be strong factors contributing to attentional control (Anderson et al., 1981).

The factor of viewer age has frequently emerged as a variable of significance, particularly with regard to determining at what age children begin to attend to and comprehend the content of the television program. Very young children (6 to 12 months of age) appear to direct attention to the television screen about half the time in controlled situations (Hollenbeck & Slaby, 1979; Lemish & Rice, 1986), with a dramatic increase between 12 and 48 months (Anderson & Levin, 1976). In their study, Anderson and Levin observed an increase in look lengths by a factor of 4 at approximately 30 months of age. Other researchers have reported similar findings (Carew, 1980; Schramm, Lyle & Parker, 1961). Attention appears to increase continuously beyond this age to about 12 years, at which point it plateaus (Alwitt et al., 1980; Anderson, 1983;

Anderson, Lorch, Field, Collins & Nathan, 1986; Anderson, Lorch, Field & Sanders, 1981; Calvert, Huston, Watkins & Wright, 1982).

The unique role of the formal features of television has been the focus of much research on children's attention. Such features include both visual and auditory production effects that are integral to the television program composition and presentation. Formal features have significant implications for attention, comprehension, and, as has been discussed previously, modeling and activating cognitive skills. In terms of attention, the research has indicated that only some formal features, specifically special visual effects, changes in scene, character change, and high levels of action, are reasonably effective at eliciting attention, while conventional camera effects such as cuts, zooms, and pans have substantially less power to gain attention (Rice, Huston & Wright, 1983). The visual feature that most inhibited attention was the long zoom effect. Other program components, such as animation, puppets, and frequent changes of speaker, while not actually production features, were also found to promote attention. Those components that decreased attention were live animals, song and dance, and long speeches (Alwitt et al., 1980; Anderson & Levin, 1976; Calvert, Huston, Watkins & Wright, 1982).

Several researchers have observed that the sound track of the television program plays a major role in attention, particularly in gaining the attention of the nonviewing child (Anderson & Field, 1983). With respect to the generalized use or effect of the audio track to direct attention, Lorch et al. (1979) found that auditory attention parallels visual attention* and increases with age at a rate similar to that of visual attention. When the audio message was experimentally degraded so as to be unintelligible, either through technical reversal or substitution, children at ages 2, 3 1/2, and 5 years evidenced significant drops in attention to Sesame Street programs, with the most significant drop being observed with the older children (Anderson, Lorch, Field & Sanders, 1981). It has also been reported that children employ the audio message to monitor the program for critical or comprehensible content, which they can then attend to visually (Anderson & Lorch, 1983). Auditory attention to television is, to a large degree, mediated by the formal attributes of the auditory message, including type, age, and gender of voice, and the novelty of particular sound, sound effects, or music. Research conducted by Alwitt et al. (1980) revealed that certain audio effects were effective in gaining attention from nonviewing children. These included auditory changes, sound effects, laughter, instrumental music, and children's, women's, and "peculiar" voices; while men's voices, individual singing, and slow music inhibited attention (Anderson & Lorch, 1983). The researchers concluded that auditory devices such as those described cued the children that an important change was taking place in the program which might be of interest, thereby prompting attention. They also reported that audio effects do not appear to

have any significant effect before the age of 24 to 30 months, which parallels approximately the beginning of general attending behavior noted previously.

When all types of formal features, both visual and auditory, are considered in terms of their ability to facilitate attention, it becomes apparent that those which are most obvious are generally most effective (Wright, Huston, Ross, Calvert, Rolandelli, Weeks, Raeissi & Potts, 1984). These researchers contend that the more perceptually salient a feature is, such as fast action or pace, the more effectively it will gain attention. This was partially confirmed in research they describe in which those programs identified as high in feature saliency also had larger viewing audiences. Interestingly, *Sesame Street*, which has a high viewership and attention-gaining-power, has been found to be slower paced (in terms of shot length) than other entertainment programs (Bryant, 1992). Evidence was also found which suggests that violence per se is not necessarily attention gaining, but rather the high saliency of formal features in violent programs may be responsible for the higher viewer numbers (Huston & Wright, 1983; Wright et al., 1984; Wright & Huston, 1982).

The differential effects of both visual and auditory formal features have been cited by several researchers as significant evidence supporting the active theory of attention to television (Anderson & Field, 1983; Rice, Huston & Wright). They contend that for the reactive theory to be an apt descriptor of children's attentional behavior, all formal features should be effective at virtually all ages, because they should all automatically elicit an orienting reaction due to their movement, stimulus change, or salient visual patterns. Since the research consistently identifies only certain features at particular ages as attention gaining and conversely finds that other features are inhibiting to attention, this hypothesis is strongly rejected (Anderson & Field, 1983). With regard to the active theory, they describe the viewing child as actively and selectively in command of his or her own attentional strategies. For this reason, the child could be expected to respond differentially to the various stimuli and features, which is the case made by current research findings (Hawkins, Kin & Pingree, 1991). Alwitt et al. (1980) conclude:

An attribute (feature) comes to have a positive or negative relationship to attention, we hypothesize, based on the degree to which it predicts relevant and comprehensible content. A child can thus use an attribute to divide attention between TV viewing and other activities: Full attention is given when an attribute is predictive of understandable content and terminated when an attribute predicts irrelevant, boring, and incomprehensible content (p. 65).

11.3.5 Children's Comprehension of Television

Anderson and Field (1983) explain that formal features perform two significant functions: First, they mark the beginning of important content segments, and second, they communicate producer-intended concepts of time, space,

action, and character (Anderson & Field, 1983). The notion that the formal features, which comprise such television effects as montage, are able to convey changes in time, place, or movement is integral to a viewer's ability to comprehend story content and plot as well as simply to gain or hold attention. It is in the area of comprehension that formal features appear to play the most important role.

11.3.5.1. Relationship of Comprehension to Attention. The basic theory related to children's comprehension of television relates to and derives from theoretical bases for attention (Anderson & Lorch, 1983). They cite the reactive theory for suggesting that once attention has been gained, comprehension will automatically follow as a natural consequence. Interestingly, Singer (1980) and Singer and Singer (1982), proponents of the reactive theory, suggest that the rapid pace or delivery of most television messages that gain or hold attention, may not permit the viewer to process adequately the information at a deep enough level to ensure high levels of comprehension. The active theory, on the other hand, maintains that attention itself is directed by children's monitoring* of the program for comprehensible content, which serves as a signal to focus more direct attention to the message (Anderson & Lorch, 1983). To represent the relationship, Rice, Huston, and Wright (1982) offered the attentional model presented in Figure 11 - 1. In this model, both high and low levels of comprehensibility inhibit attention. At the high end (incomprehensibility), the content is complex and not understood by the child and consequently elicits little interest or attention. At the low end (boredom), the content is familiar and lacking in information, making it less attention gaining. In this way, comprehension is interpreted to drive attention (Rice, Huston & Wright, 1983).

A good deal of the theory related to the formal features of television has relevance for the area of comprehension as well as attention. Of particular interest is the concept of montage, one of the formal features previously described. A montage is a series of scenes interrupted by special effects such as cuts, dissolves, changes in point of view, and overlays, the purpose of which is to show various shifts in time, place, or personal point of view. Such actions call on the viewer to maintain a sequence of events, infer changes of scene or time, and to relate or integrate individual scenes to one another (Anderson & Field, 1983). In this way, any two scenes can be joined together to generate a new idea or suggest a relationship that has not been explicitly shown.

Piaget (1926) suggested that younger children (under 7 years) were limited in story comprehension because of weak seriation abilities and the inability to infer and comprehend transformations between events in a story which differ temporally. These limitations reduce the ability to develop complete schemas and consequently impair comprehension. Inconsistencies across theories such as these, however, have produced a dilemma among researchers concerning the ability of children to comprehend fully information presented in this manner via television (Wartella, 1979).

11.3.5.2. Research on Comprehension. Substantial research has addressed the interrelationship between comprehension and attention and the resultant support of the active theory suggested by Anderson and Lorch (1983). Lorch et al. (1979) compared different experimental attention situations in terms of recall of Sesame Street content by 5-year-olds. Their findings revealed that variations in the amount of attention a child demonstrated did not differentially affect comprehension scores. However, a significant positive correlation was found between the comprehension scores and the amount of attention exhibited during the specific program content that was related to the comprehension test items. These findings were further supported in research reported by Krull and Husson (1979) and Pezdek and Hartman (1981) who also identified the significance of audio cues in promoting comprehension as well as directing visual attention. A later study, however, by Anderson, Lorch, Field, and Sanders (1981, study 2), which controlled for extraneous confounding effects of formal features inserted in the programs, produced data that fully supported the earlier findings of Lorch et al. (1979). All in all, these studies provided strong support for the active theory over the reactive theory, in that attention appeared to be significantly directed by the comprehensibility of the program content.

Understandably, the role of formal features in comprehension is directly related to the active theory of television viewing. Anderson and Field (1983) suggest that the employment of formal features in a montage serve the purposes of the producers of the program to convey or infer changes in time, space, action, or point of view. They further contend that the active comprehension hypothesis is consequently supported, in that if children did not actively make the inferences, they would perceive the program as meaningless segments of video and would, therefore, not attend to it.

The earliest research on comprehension of film montage suggested that young children were incapable of comprehending the elements of montage (Piaget, 1926). Empirical research supported these contentions (Baron, 1980; Noble, 1975; Tada, 1969). In these cases, assessment of children's comprehension was made via verbal explanations of what had occurred, a process that has been criticized as being extremely difficult for younger children (Smith, Anderson & Fisher, 1985). In research that employed nonverbal testing methods such as reconstructing the story using dolls and the original television sets, these researchers found that children aged 3 and 5 years showed substantial comprehension of program content. It is interesting to note that no differences were found between treatments that employed the formal features of pans, zooms, fades, and dissolves and those treatments that relied solely on still photographic representation. Montage that incorporated formal features was apparently not necessary for comprehension of the story. Rather, children were able to comprehend the message presented via either montage or still pictures with equal ability. In a second experiment, Smith et al. (1985) examined the effects of

specific montage elements in terms of the outcomes (ellipsis, spatial relationships, character point of view, and simultaneity of action) intended by the producer. In this case, both 4- and 7-year-olds demonstrated good comprehension via the nonverbal evaluation technique, with 7-year-old children showing greater comprehension. The researchers attribute this result to a greater amount of life experience on the part of the older children. A later study conducted by Huston and Wright (1989) indicated that formal features used in montage, such as those used to depict distorted perceptions, memory flashbacks, and instant replays were not comprehended well by school age children, Anderson and Collins (1988) have generally concluded that the features incorporated in montage are well comprehended by children, particularly those who are older and have greater prior experience and knowledge. Anderson and Field (1983) contend that the results of these studies indicate that young children make frequent, active inferences as they interpret montage effects in television programming. Furthermore, they suggest that this fact provides strong support for the active-comprehension hypothesis.

The comprehension of longer segments of programming that necessitated integration and inferencing skills was investigated by Lorch, Bellack, and Augsbach (1987). In two experiments, they determined that both 5-year-olds and 4- and 6-year-olds were capable of selectively recalling 92% of ideas that were central to the television stories. Much lower recall rates were found for incidental or noncentral information. In an earlier study, however, Calvert, Huston, Watkins, and Wright (1982) found that children recalled central content that was presented by means of highly salient formal features better than that which used low-salience features. In studies in which the programming content was of much longer duration, such as in commercially broadcast programs, older viewers were generally able to discriminate central content better than younger viewers (Collins, 1983). Collins further suggested that an inability to make inferences contributed to comprehension difficulties, although this research was conducted using entertainment programming that was intended primarily for adult audiences. Anderson and Collins (1988) concluded, however, that the poor comprehension of both central and implied content should be attributed primarily to less-developed knowledge bases rather than to any cognitive disability. More recent research (Sell, Ray & Lovelace, 1995) suggests, however, that repeated viewing of the program results in improved comprehension by 4-year-old children. They attribute this effect to more complete processing of the formal features that enabled children to focus on essential information critical to understanding the plot.

11.3.6 Summary and Recommendations

Two theoretical orientations have emerged with regard to the cognitive processing of television program content and the effect of the formal production features on that processing. The earlier, reactive theory suggested that the child was

a passive entity that could only react to the stimuli being presented. A number of writers accepted this theory and employed it to further describe the viewer as not only passive but also mesmerized by the flickering stimuli presented on the screen. Only modest data, however, reflect a negative effect of certain types of television programming on attention and cognitive processing, and virtually no reliable research confirms the strong, deleterious effects claimed by a number of popular writers and critics of television.

A second opposing position, the active theory (or the active comprehension theory), drew on more contemporary cognitive views of the learner and described the child as actively exploring and analyzing the program content being presented. This theory suggests that attention to the television program is not a reaction to stimuli but rather a monitoring and comprehension process to identify meaningful content requiring more directed attention.

Research has generally supported the active hypothesis, describing the attentional and comprehension processes as highly interrelated, with comprehension being a precondition to attention. Comprehension is further facilitated through the effects of formal features that function as elements of montage to infer meaningful changes in space, time, and point of view.

The television image has been shown to incorporate a unique symbol system that has certain specifiable capabilities it shares with no other medium. The modes of symbolic representation in television exist as a singular language that must be learned by the child. The specific effects of formal features have received substantial research attention with regard to both attention and comprehension processes, as well as to their ability to model and activate cognitive skills. The importance of formal features as they interact with content has also been underscored by many findings; however, their interaction with other variables has not been pursued sufficiently by researchers. Any research agenda should include continuing investigation of formal features, especially their complex interactions with other variables.

The simple act of a child viewing television has been demonstrated not as a response to stimuli but as a complex, purposeful cognitive activity that becomes progressively sophisticated as the child matures to adulthood. The cognitive effects of such activity have far-reaching consequences for both formal and informal educational activities.

11.4 SCHOLASTIC ACHIEVEMENT

Television viewing has gained the widespread reputation of being detrimental to scholastic achievement. This perception of many teachers, parents, and researchers stems primarily from the negative statistical relationship sometimes found between amount of time spent watching television and scholastic performance (Anderson & Collins, 1988). The relationship between television and scholastic achievement is

much more complicated and complex than such a simple inverse relationship suggests (Beentjes & Van der Voort, 1988; Comstock & Paik, 1987, 1991; Neuman, 1991). A review of the research on scholastic achievement, focusing particularly on that produced since the early 1980s, reveals the likelihood of many interacting variables influencing the impact of television.

This section of the chapter will first discuss some theoretical assumptions and major theories about television's impact on scholastic achievement, including a brief review of the body of research and methodological issues. A summary of the intervening variables that have been studied with regard to the television/achievement association and the current conclusions about that relationship will follow.

11.4.1 Theoretical Assumptions

Research on television's impact on scholastic achievement hinges on two assumptions. The first is the belief that an objective measurement of television viewing can be obtained. The second concerns the assessment and measurement of achievement. The methods used to gather data on both are similar.

Television viewing is often defined by hours of viewing per day or week. This information is primarily gathered through self-reporting instruments or parental diaries. Rarely is a distinction made about how the student is relating to the television set, whether or not others are in the room, or if there are concurrent activities being performed. A few studies record the type of programming watched, but again, these data are usually gathered from the subjects within a self-reporting context instead of by direct observation.

Scholastic achievement is overwhelmingly defined in the literature as reading. Reading assessments in the form of achievement tests on vocabulary and comprehension are the primary source of comparison. Some studies measure other school-related achievement such as mathematics but commonly discuss their study results mainly in terms of the reading scores. While this may be limiting in terms of our understanding of scholastic achievement, it has allowed for more comprehensive meta-analyses and comparisons between studies than otherwise would have been possible.

11.4.2 Major Theories

Research in this arena of television's effects has had two major thrusts. Researchers first sought to discover if there was an association between television and scholastic achievement. Many, having concluded that there was such an association, expanded their studies to search for the nature of the relationship. A number of theories attempt to explain and account for the often conflicting and confusing results of studies.

11.4.2.1. Frameworks for Theory. Hornik (1981) suggested a number of hypotheses for the relationship between television viewing and achievement. Television may (a) replace study time, (b) create expectation for fast-paced activities, (c) stimulate interest in school-related topics, (d) teach the same content as schools, (e) develop cognitive skills that may reinforce or conflict with reading skills, and (f) provide information concerning behaviors. Except for the first hypothesis, Reinking and Wu (1990), in their meta-analysis of studies examining television and reading achievement, found little research systematically investigating Hornik's theories.

Beentjes and Van der Voort (1988) grouped potential theories by impact. The facilitation hypothesis asserts a positive association, while the inhibition hypothesis asserts a negative association, and the no-effect hypothesis asserts no association. They found the most support for the inhibition hypothesis but noted that heavy viewers, socially advantaged children, and intelligent children are most vulnerable to the negative impact of television.

In her book *Literacy in the Television Age*, Neuman (1991) examined four prevailing perspectives of the television/achievement relationship: the displacement theory,* the information-processing theory, the short-term gratifications theory, and the interest stimulation theory. Her analysis of the evidence supporting and refuting each of these hypotheses is one of the most accessible and comprehensive to date. She also includes practical suggestions to help parents and teachers delineate situations where television can be beneficial for scholastic achievement and literacy development. Through Neuman's framework, we can examine the body of literature on the association between television viewing and scholastic achievement.

11.4.2.2. Displacement Theory. The displacement theory emerged in the late 1950s out of studies demonstrating that children watch many hours of television weekly. The displacement hypothesis* has been proposed by many theorists and critics to explain the effect of television viewing on other activities. This hypothesis states that "television influences both learning and social behavior by displacing such activities as reading, family interaction, and social play with peers" (Huston et al., 1992, p. 82). Since children are not spending those hours doing something else, television is displacing other activities. Theorists suggested that the negative relationship sometimes found between television and achievement occurs because the activities being replaced are those that would enhance school performance (Williams, 1986). This theory is the most consistently present construct in achievement research.

Research supports the displacement hypothesis to some extent. The functional displacement hypothesis* holds that one medium will displace another when it performs some of the functions of the displaced medium (Himmelweit, Oppenheim & Vince, 1958, cited in Comstock & Paik, 1991). Therefore, television does displace other activities, but mostly

similar activities such as use of other media (Huston et al., 1992). "Moreover, when children watch television together, their play is less active—that is, they are less talkative, less physically active, and less aggressive than during play without television" (Gadberry, 1974, cited in Huston et al., 1992, p. 86).

Trend studies, which analyze the change in scholastic (reading) achievement over the decades of television's diffusion into everyday life (Stedman & Kaestle, 1987; M. Winn, 1985), have generally supported the displacement theory. Their results provided weak evidence of the existence of a negative television/achievement relationship, since societal changes during the time periods studied include much more than the advent of television.

Another type of longitudinal research design uses surveys to measure a link between television viewing and achievement using measures of the same subjects' media use and achievement (Gaddy, 1986; Gortmaker, Salter, Walker & Dietz, 1990; Ritchie, Price & Roberts, 1987). Gaddy's analysis of 5,074 high school students during their sophomore and their senior years attempted to ascertain whether television viewing was impacting achievement by replacing more enriching activities. He found no significant correlations when other variables were controlled. Nor did television viewing rates predict 2-year reading-skill changes. Gaddy hypothesized that other researchers have found significant results due to their failure to consider important intervening variables,

The displacement theory received more rigorous support from quasi-experimental studies typified by the analysis of the impact of television's introduction into a community or the comparison of children in households with and without a television set (Greenstein, 1954; Hornik, 1978). Cordeen and Williams's 1986 study of three British Columbia communities, one without television (Notel), one with a single television channel (Unitel), and one with multiple channels (Mulitel), is a classic example of this design. In the first phase, the 217 children in the communities attending grades 2, 3, and 8 were tested for reading fluency before Notel received television transmissions. Two years later, when the children were in grades 4, 5, and 10, they were retested. In phase 2, 206 new second-, third-, and eighth-graders were tested. In a connected data-gathering activity, a reading assessment of vocabulary and comprehension was administered to students in grades 1 through 7 in all three communities 6 months after television came to Notel.

The cross-sectional and longitudinal analyses of these data sets produced very complex findings: (a) Over the 2 years, those Notel children who started the study in second and third grades showed gains in reading fluency that were not significantly different from their Unitel and Mulitel counterparts; (b) the eighth-graders showed less progress if they lived in Notel; (c) phase 1 second- and third-graders had higher fluency scores than phase 2 second- and third-grad-

ers; and (d) Notel's second- and third-grade scores were higher than those in Unitel and Mulitel on the assessment of reading comprehension and vocabulary.

Corteen and Williams's somewhat conflicting results also epitomize the difficulty and complexity of studies of television effects. Although not unequivocal, as a whole their data suggested that television may hinder the development in reading skills for children at certain ages (Beentjes & Van der Voort, 1988).

A number of correlational studies, which focused on the same two variables—amount of time spent watching television and cognitive development as measured by reading achievement test scores—have also found support for the displacement theory. However, the data, on the whole, from such simple correlational studies have been shown to be conflicting, finding negative, positive, or no significant relationship between television viewing and reading achievement (Bossing & Burgess, 1984; Quisenberry & Klasek, 1976; Zuckerman et al., 1980). Further analysis of more recent studies with larger sample sizes suggests that the relationship is likely to be curvilinear rather than linear, with achievement rising with light television watching (1 to 2 hours per day), but falling progressively with heavier viewing (Anderson et al., 1986; Fetler, 1984; Searls et al., 1985).

This curvilinear view of the negative association between television and achievement has been addressed by researchers using meta-analysis, a technique that attempts to discover trends through arithmetic aggregation of a number of studies. A key study of this type is Williams, Haertel, Haertel, and Walberg's 1982 analysis of 23 studies that examined the relationship between scholastic achievement and television viewing. The results of these meta-analyses were the basis for Comstock and Paik's discussion of scholastic achievement (1991). The five large-scale studies that became their major sources include:

1. The 1980 California Assessment Program (including Fetler & Carlson, 1982) that measured 282,000 sixth-graders and 227,000 twelfth-graders for mathematics, reading, and writing achievement, and for television viewing.
2. The 1980 High School and Beyond study (Keith, Reimers, Fehrman, Pottebaum & Aubey, 1986) that compared 28,000 high school seniors' television viewing in terms of achievement scores in mathematics and reading.
3. The 1983—1984 National Assessment of Educational Progress data (Anderson, Mead & Sullivan, 1988) that described the relationship between viewing and reading for 100,000 fourth-, eighth- and eleventh-graders across 30 states.
4. Neuman's synthesis of eight state reading assessments that included measures of attitudes toward television representing nearly 1 million students from fourth-through twelfth-grades (1988).

5. Gaddy's data from several thousand students who were studied during their sophomore and senior years (1986). A small average negative effect was obtained for the relationship between television and scholastic achievement by Williams and his associates. Interestingly, effects were slightly positive for lighter viewers (up to 10 hours weekly) and grew increasingly negative as students' viewed more television.

Comstock and Paik (1991) noted that for students who are not fluent in English, the opposite is true, with some important qualifications: (a) Family socioeconomic status has a stronger negative correlation with achievement than the negative correlation between television viewing and achievement; (b) as socioeconomic status rises, the inverse association between amount of television viewed and achievement increases; (c) this relationship is stronger for older students; and (d) for low-socioeconomic-status families there is only a slight rise in achievement associated with television viewing, especially for younger students.

A number of researchers augmented our understanding of the characteristics of television's impact on scholastic achievement by controlling for variables suspected of intervening (Anderson, Mead & Sullivan, 1988; Fetler & Carlson, 1982; Keith, Reimers, Fehrmann, Pottebaum & Aubey, 1986; Morgan, 1982; Morgan & Gross, 1980; Neuman, 1988; Potter, 1987; Ridley-Johnson, Cooper & Chance, 1982). In these studies, one or more third variables, often intelligence and socioeconomic status, are controlled. As a result, the relationship measured between achievement and television is not confounded by the third variable. For instance, controlling for intelligence tends to reduce the degree of negative association. However, the relationship remains intact for certain viewers and some content, such as adventure or entertainment programs (Beentjes & Van der Voort, 1988). Data from this form of research permit more precise analysis of variables that are involved in the complex interaction of television watching and scholastic achievement,

Neuman argued that the two pieces of evidence needed to validate the displacement theory, proof that other activities are being replaced and a demonstration that those activities are more beneficial to scholastic achievement than television, have not been adequately established in the literature (Neuman, 1991). Neither leisure reading at home nor homework activities have been consistently found to be displaced by television. Instead, functionally equivalent media activities such as movies or radio seem to be affected by television viewing (Neuman, 1991). Since other activities have not been proved to be more beneficial than television, Neuman finds the displacement theory unsubstantiated. The body of literature on achievement supports the need for a much more complex and sophisticated model than the simplistic one represented by pure displacement theory. Another trend in achievement research identified by Neuman is information-processing theory that examines the ways

television's symbol system impacts mental processing. This theory was discussed in the section on message design and cognitive processing.

11.4.2.3. Short-Term Gratification Theory. Short-term gratification theory deals primarily with affective and motivational components of the learner: enthusiasm, perseverance, and concentration. Proponents of this theory, many of whom are teachers, believe that television's ability to entertain a passive viewer has "fundamentally changed children's expectations toward learning, creating a generation of apathetic spectators who are unable to pursue long-term goals" (Neuman, 1991, p. 105). They argue that students have come to believe that all activities should be as effortless as watching television and that students' attention spans are shorter due to such fast-paced programming as *Sesame Street* (Singer & Singer, 1983). This issue was presented in the section on mental processing and will be discussed in the section on "Programming and Utilization."

Writers in the 1970s claimed that the children's program *Sesame Street* had a number of undesirable unintended effects, namely, increased hyperactivity (Halpern, 1975) and reinforced passivity (Winn, 1977), especially when compared to its slower-paced competition *Mister Rogers' Neighborhood* (Tower, Singer, Singer & Biggs, 1979, cited in Neuman, 1991). These unintended effects gave credence to the short-term gratification theory and the general bias against the television medium. However, further investigations shed doubt on the accuracy of these conclusions (Anderson, Levin & Lorch, 1977; Neuman, 1991) by discovering that individual differences, family-viewing context, and other intervening variables were interacting within the association between television and achievement,

Salomon's theory of amount of invested mental effort (AIME*) suggested that children approach television as an "easy" source of information and, therefore, tend not to expend much mental effort to understand, process, and remember the information in television programs (Salomon, 1983, 1984). He explained that this caused most to perform below their capabilities unless they were specifically directed or encouraged to learn from the source. He further speculated that this "effort-free" experience became the expectation for other sources of information as well,

Gaddy's (1986) theory of diminishing challenge concurred with the concept that as children grow older they find television less cognitively challenging; thus, they need less effort to understand the information. Typical teenagers will spend less time watching television, Gaddy concluded that those who continue to watch at high levels are therefore spending an inordinate amount of time in cognitive "laziness."

11.4.2.4. Interest Stimulation Theory. The fourth trend in achievement research discussed by Neuman is the interest stimulation theory. This hypothesis suggests that televi-

sion can potentially spark a student's interest in or imagination about a topic, fostering learning and creativity.

Examples of television's initiating interest, as demonstrated by increased reading and study around a topic, can be taken from most of our lives. For instance, after the broadcast of the miniseries *Roots*, Fairchild, Stockard, and Bowman (1986) reported that 37% of those sampled indicated increased interest and knowledge about issues of slavery. Similarly, Hornik (1981) has shown that adult book sales will boom after a special program airs on television, Morgan (1980) found that children who watch more television when they are younger are likely to read more when they are older. While this phenomenon has been measured, the arousal of interest and generation of incidental knowledge about subjects broadcast on television has been described as fleeting (Comstock & Paik, 1991; Leibert & Sprafkin, 1988; Neuman, 1991).

Neuman (1991) summarized three reasons to account for the ephemeral nature of incidental learning from ordinary entertainment viewing. First, most people who casually view television lack the intention to learn. Therefore, they do not engage in active cognitive processing of the material. Second, the redundancy of plot and character and the low intellectual level in most television programming increases the likelihood that any information intended for learning was previously mastered. Finally, unless the material has direct relevance to the viewer, any incidental information learned is quickly forgotten due to lack of reinforcement and practice. She suggests a series of concomitant strategies of parental and teacher mediation that can activate, broaden, and focus television's potential to stimulate interest in school-related topics under natural home-viewing conditions (Neuman, 1991).

11.4.2.5. Theories Related to Imagination. The idea of television as a stimulator of imagination and creativity has been an area of debate among scholars and researchers. Admittedly, studying the imagination is a difficult prospect at best. Techniques to do so have ranged from observations and self-reports to imagination tests using inkblots or inventories to teacher and parental descriptions. In his work *Art, Mind and Brain: A Cognitive Approach to Creativity* (1982), Howard Gardner recounts observations and research that support the idea that television is a rich medium for imaginative activity. "The child's imagination scoops up these figures from the television screen and then, in its mysterious ways, fashions the drawings and stories of his own fantasy world" (p. 254). He purports that television stimulates the sensory imagination of the young much more successfully than it generates the abstract, conceptual lines of thought important to older viewers' creativity.

Other researchers have found evidence of television's stimulation of imaginative play. Alexander, Ryan, and Munoz (1984) found brothers who used television-generated conversation to initiate fantasy play. James and McCain (1982)

recorded children's play at a daycare center and observed that many games created by those children were taken from television characters and plots. They noted that the themes occurring in such television-activated play were similar to those in play not stimulated by television. Commercials in particular have been demonstrated in certain circumstances to contribute to imaginative activity (Greer, Potts, Wright & Huston, 1982; Reid & Frazer, 1980.)

A considerable amount of research in the area of television's impact on the imagination of the viewer, particularly that of children, has been conducted by Jerome and Dorothy Singer and various associates. They have concluded that television can present general information, models for behavior, themes, stories, and real and make-believe characters who are incorporated into creative play (Singer & Singer, 1981, 1986). This process is not guaranteed, nor is it always positive. Rather, a pattern emerges of a conditional association between television and developing imagination.

The first condition is the type of programming viewed. A number of studies have linked high-violence action adventure programs to decreased imagination, and low-violence situation comedies or informative programs with increased imagination (Huston-Stein, Fox, Greer, Watkins & Whitaker, 1981; J. Singer & Singer, 1981; Singer, Singer & Rapaczynski, 1984; Zuckerman, Singer & Singer, 1980). Singer and Singer have also argued that the pacing of television can impact the amount of imaginative play, with slower, carefully designed programs, such as Mister Rogers' Neighborhood, generating conditions for optimal creative thought and play (Singer & Singer, 1983). Dorothy Singer reported two studies on the effect of Sesame Street and Mister Rogers' Neighborhood on children's imagination (Friedrich & Stein, 1975, cited in Singer, 1978; Tower, Singer, Singer & Biggs, 1978). Mister Rogers' Neighborhood produced a significant increase in imagination. Sesame Street did not.

The type of programming watched may also affect the nature of fantasy activities. Rosenfeld, Huesmann, Eron, and Torney-Purta (1982) used J. Singer and Antrobus's (1972) Imaginal Processes Inventory to categorize types of fantasy. They found three types: (a) fanciful play around fairy tales and implausible events, (b) active play around heroes and achievement, and (c) aggressive negative play around fighting, killing, and being hurt. Children, chiefly boys, who demonstrated aggressive negative fantasy were those who tended to watch violent action adventure programs regularly (Singer & Singer, 1983). McIlwraith and Schallow (1982, 1983) and Schallow and McIlwraith. (1986, 1987) investigated various media effects on imaginativeness in children and undergraduates and found connections between programming genre and type of imaginative thinking. For instance, pleasant, constructive daydreams came from watching drama, situation comedies, or general entertainment programs.

The second condition of television's association with imagination is the amount of time spent viewing television. Heavy viewers have been shown to be less imaginative (Peter-

son, Peterson & Carroll, 1987; Singer & Singer, 1986; Singer, Singer & Rapaczynski, 1984). Children who watch television many hours weekly tend to also exhibit traits within their fantasies similar to those who watch action adventure programs. This is evidenced by the fact that they tend to be aggressive and violent in their play (Singer & Singer, 1983).

The final condition within the television and imagination association is that of mediation or family viewing context. Singer, Singer, and Rapaczynski's (1984) study found parental attitudes* and values about imagination to be a stronger indicator of child imaginativeness than type or amount of television viewing. D. Singer and Singer's (1981) year-long examination of 200 preschoolers within three treatment groups found that the greatest gains in imaginativeness were associated with adult mediation. The first group had television exposure and teacher-directed lesson plans designed around 2- to 3-minute televised segments intended to improve the child's cognitive, social, and imaginative skills. The second group received the specialized lesson plans without television exposure. The final group received the ordinary school curriculum. The results from the first group showed gains in imagination and other social skills such as leadership and cooperation.

Though the results of these studies examining television's effects on imagination are not universal, they reveal a pattern of conditional benefit. Children who are exposed to a limited amount of television, who watch carefully selected programs in terms of content and pacing, and who engage in conversations with adults who mediate that exposure are likely to use their television experience as a springboard to positive, creative, and imaginative activities.

11.4.2.6. Future Directions for Theory. Neuman (1991) concluded that we need a conceptual model to account for (a) the many uses for television, (b) the "spirited interplay" between various media including television, (see 8.4), and (c) the impact of television on scholastic achievement. The writings of Comstock and Paik (1991), Beentjes and Van der Voort (1988), and Reinking and Wu (1990) support the need for a conceptual model that links research variables. The difficulty researchers have encountered in finding consistent, definitive evidence about the magnitude and shape of an association and a functional description of such an association between television viewing and scholastic achievement may be due to the presence of negative bias toward television. Additionally, there is the aforementioned difficulty of the lack of a conceptual model that adequately explains the complex interactions of variables such as age, socioeconomic status, family viewing context, and intelligence.

11.4.3 Methodological Concerns

While many early studies found significant negative correlations between television viewing and achievement, reviewers (Beentjes & Van der Voort, 1988; Hornik, 1981; Neuman, 1991; Reinking & Wu, 1990) note that severe flaws

in design shed doubt on the veracity of those early findings. These include: (a) small sample size, (b) lack of control for intervening variables, (c) less-powerful analysis techniques, (d) relative inattention to the content of programming, and (e) unreliable self-reporting instruments, whereas subsequent studies with larger sample sizes, better controls, and more rigorous analysis have continued to discover consistently significant relationships between television viewing and scholastic achievement (Anderson et al., 1986; Fetler & Carlson, 1982; Gaddy, 1986; Keith et al., 1986; Neuman, 1988).

Ritchie, Price, and Roberts (1987) postulated that television may have the most profound impact during the preschool years. Another concern they raise is the question of long-term exposure to the effects of television. This is a dilemma for researchers which can be addressed by more rigorous longitudinal studies.

Neuman (1991) itemized additional concerns about the television and achievement literature: (a) The majority of the research lacks a driving theory; (b) many studies purport to be qualitative but are actually anecdotal; (c) scholastic achievement has been narrowly defined and measured, focusing on reading achievement scores; and (d) due to an assumption that print is the intellectually superior medium, a negative bias pervades the literature,

11.4.4 Intervening Variables

A brief look at the variables that have been studied for their potential differential effects throughout the research will help illustrate the complexity of the interaction between the individual and television in terms of subsequent scholastic achievement.

11.4.4.1. Age. As with many other variables, there is conflicting evidence regarding how the variable of age affects scholastic achievement. The literature suggests that the negative correlation between television viewing and achievement is stronger for older students, which implies that older students may replace study time with television viewing, while younger children are monitored more closely by parents with regard to studying (Anderson et al., 1986; Neuman 1988; Roberts, Bachen, Hornby & Hernandez-Ramos, 1984; Searls, Mead & Ward, 1985).

11.4.4.2. Gender. Studies comparing the effects of television viewing on the scholastic achievement of boys and girls have produced conflicting findings. Morgan and Gross (1980) found a negative relationship for boys between television viewing and scholastic achievement. In contrast, Williams, Haertel, Haertel, and Walberg's (1982) meta-analysis identified a negative relationship for girls.

11.4.4.3. Intelligence. Morgan (1982) and Morgan and Gross (1980) found that the negative association between television and achievement was strongest for children of

higher abilities. They found no significant effect for low- and medium-levels of intelligence. As with older children, television may have a greater impact on highly intelligent students because it displaces more cognitively stimulating activities (Beentjes & Van der Voort, 1988).

11.4.4.4. Home-Viewing Environment. Researchers have found that television-watching and leisure-reading patterns of children often reflect those of their parents (Morgan, 1982; Neuman, 1986). Many factors of the home environment are statistically significant indicators of television watching, especially for younger children (Roberts et al., 1984). Behavioral patterns of leisure reading and television watching seem to persist into adulthood (Reinking & Wu, 1990; Ritchie et al., 1987).

11.4.4.5. Reading Skills. Research on various levels of reading skill is inconclusive, due mainly to the habit of measuring reading skill with one overall score (Beenjes & Van der Voort, 1988). Corteen and Williams (1986) found a connection to comprehension, but not vocabulary, in their study of three Canadian towns.

11.4.4.6. Socioeconomic Status. Although heavy viewers universally have lower scholastic achievement, for light and moderate viewers socioeconomic status seems to have a place in the interaction. Contrary to high socioeconomic status children who demonstrate a negative correlation, low socioeconomic-status children can improve achievement with television viewing (Anderson et al., 1986; Fetler, 1984; Searls et al., 1985). Combined with findings on the effect of intelligence, many scholars have reached a conclusion that supports the displacement theory in specific situations.

The pattern invites a proposition: television viewing is inversely related to achievement when it displaces an intellectually and experientially richer environment, and it is positively related when it supplies such an environment (Comstock & Paik, 1987, p. 27).

11.4.4.7. Type of Programming Watched. Purely entertaining television programming such as cartoons (see 11.7.1.3), situation comedies, and adventure programs (see 11.5.5.2) have a negative correlation with school achievement (Neuman, 1981; Zuckerman, Singer & Singer, 1980). News programs (see 11.7.3) and other highly informative shows, on the other hand, have a positive relationship to achievement (Potter, 1987).

11.4.4.8. Various Levels of Viewing Time. Many studies have found different levels of viewing time (see 11.5.5.1) to be an important element in television's relationship to achievement (Anderson et al., 1986; Fetler, 1984; Neuman, 1988; Potter, 1987; Searls et al., 1985). In their discussion of Williams et al. (1982), Comstock and Paik concluded that there is a good possibility of curvilinearity at the intermediate and primary grades, especially for households of lower socioeconomic status or using English as a second language

(1987, 1991). For these groups, television can have a beneficial effect at moderate levels of viewing.

One of the problems of interpreting studies of the effect of viewing time on achievement is that the content or context of that viewing time is often ignored, yet may have an effect. For example, in the early evaluations of Sesame Street, viewing time was positively correlated with learning outcomes when it was measured as an approximation of “time on task.” If a more undifferentiated measure of viewing time—one unconnected with the content of sequences or programs—had been used, the findings may have been different. What is the relationship of intentional-and incidental-learning conditions to the interaction of viewing time and achievement? Is it important to distinguish between viewing as a primary activity and viewing as a secondary activity? Questions such as these need to be raised when researchers study the interaction of viewing time and achievement.

11.4.5 Summary and Recommendations

Few researchers today doubt that there is a relationship between television viewing and scholastic achievement. The debate centers instead around the nature of that association. Regardless of the seeming disparity of results, some patterns are emerging:

1. Heavy television viewers of all intellectual abilities and home environments tend to have lower scholastic achievement and demonstrate less imaginativeness when compared to their lighter-viewing peers. This effect is especially severe among students with high IQs and otherwise stimulating home environments,
2. For light-to-moderate viewers, a number of intervening variables come into play: age, ability, socioeconomic status, home-viewing environment, and type of programming watched. It has been shown that light television viewing may increase scholastic performance for children of lower abilities and lower socioeconomic status,
3. Within certain stages of intellectual and emotional development, television viewing can have a greater impact on achievement,
4. Parental attitudes and viewing patterns* are strong indicators of the child’s current and future television viewing and its effect on scholastic achievement,
5. Home-viewing environment and adult mediation of viewed material are significantly related to the incidental and intentional learning and imaginative play that comes from television viewing.

There has been a call by many for television to cease being seen as intrinsically bad or good (Gomez, 1986; Hatt, 1982; Neuman, 1991; Reinking & Wu, 1990). The perception of television as detrimental has colored the attitudes of researchers and educators alike, Jankowski said:

It is a source of constant amazement to me that the television set, an inert, immobile appliance that does not eat, drink, or smoke, buy or sell anything, can’t vote, doesn’t have a job, can’t think, can’t turn itself on or off, and is used only at our option, can be seen as the cause of so much of society’s ills by so many people in education (cited in Neuman, 1991, p. 195).

The last decade of research has shown that the relationship of television viewing to scholastic achievement is a complex proposition with many interacting variables, not just a simple, negative relationship. The impact of this medium on achievement remains far from clear. However, research continues to improve our understanding of how each individual may be influenced by television,

Future research should seek to avoid these obvious problems while building on the body of literature available. Emphasis on multivariate relationships through correlation and on meta-analyses seems the most direct route to increasing our understanding of the nature of the television] achievement relationship.

11.5 FAMILY-VIEWING CONTEXT

By the late 1970s, two reviews of research on child development had concluded that television was more than a communicator of content because it organized and modified the home environment (Atman & Wohlwill, 1978; Majoriebanks, 1979). Conversely, it was known that the home environment organized and modified television viewing. For example, Frazer (1976) found that the family routine established the viewing habits* of preschoolers, not vice versa. Today we know that demographic differences, such as ethnicity (Tangney & Feshbach, 1988) and individual differences, such as genetics (Plomin, Corley, DeFries & Fulker, 1990), also influence the family-viewing context. This section deals with variables that mediate the effects of television in the home setting, including the home environment, covieing, and viewing habits. For “television viewing occurs in an environmental context that influences what and when viewing occurs, as well as the ways in which viewers interpret what they see” (Huston et al., 1992, p. 98).

11.5.1 Variables That Mediate

The variables in the family context for television viewing can be grouped into three categories: (a) the environment, which encompasses the number and placement of sets, the toys and other media available, options for other activities, rules for viewing, and parental attitudes and style; (b) covieing, which includes the nature and frequency of interactions, the effect of attitudes, and the effect of age and roles; and (c) viewing habits, which are based on variables such as amount of viewing, viewing patterns or preferences, and audience involvement.* These variables interact to create a social environment that mediates the effects of viewing.

Mediating variables can be separated into two types of variables: direct and indirect. Direct mediating variables are those that can be controlled, such as the situation or habits. Indirect mediating variables are those that are fixed, such as educational or socioeconomic level.

The research on television as a socializing agent is extensive and will be discussed later in this chapter. Although research on family context abounds, many findings are contradictory or inconclusive. Nevertheless, there is enough research to suggest some important interactions.

One approach to visualizing the relationship between program variables (e.g., formal features, content), context variables (e.g., environment, habits, coveiwng), and outcome variables (e.g., attention, comprehension, attitudes) was presented by Seels in 1982 (see Fig. 11-2).

Another approach to conceptualizing visually the relationship of some of these mediating variables to exposure and outcomes was presented by Carolyn A. Stroman (1991) in Figure 11—3, which appeared in the *Journal of Negro Education*.

11.5.2 Theoretical Assumptions

At the level of operational investigation of these variables, assumptions are made that affect the questions researched, methodologies used, and interpretation of findings. One such issue is how television viewing should be defined. As discussed in the message design and cognitive-processing section, classic studies by Allen (1965) and Bechtel, Achelpohl, and Akers (1972) found there was a great deal of inattention while the television set was turned on. If viewing is defined as a low level of involvement, i.e., nothing more than being in the room when the television set is on, the result is estimates of the big role of television in children's lives. When estimates of viewing by 5-year-olds made from parent-kept viewing diaries and time-lapse video recordings are compared, diaries yield estimates of 40 hours a week and time-lapse video recordings analyzed for attentive viewing yield 3 1/2 hours a week (Anderson, Field, Collins, Lorch & Nathan, 1985, cited in Comstock & Paik, 1987). Viewing is often defined as "including entering and leaving the room while intermittently monitoring what is unfolding on the screen" (Comstock & Paik, 1991, p. 19).

On the other hand, current research on mental activities that occur during the television experience suggests that a great deal of mental activity can occur while viewing. Comstock and Paik (1991) suggest that a distinction be made between monitoring (paying attention to audio, visual, and social cues that indicate the desirability of attention to the screen) and viewing (paying attention to what is taking place on the screen).

The issue of whether the viewer is active or passive arises from differing conceptions of viewing and from the fact that

research has established that the viewer can be either, depending on programming and the mediating variables. Comstock and Paik (1991) cite several classic and recent studies that established a high level of mental activity despite an often low level of involvement (Bryant, Zillmann & Brown, 1983; Huston & Wright, 1989; Krendl & Watkins, 1983; Krull, 1983; Lorch, Anderson & Levin, 1979; Meadowcroft & Reeves, 1989; Thorson, Reeves & Schleuder, 1985). As previously noted in the section on message design and cognitive processing, the notion of hypnotic watching of television has been largely discredited (Anderson & Lorch, 1983; Bryant & Anderson, 1983).

Three studies by Argenta, Stoneman, and Brody (1986), Wolf (1987), and Palmer (1986) reinforce this conclusion. Wolf and Palmer interviewed children about their viewing to determine interest, thoughtfulness, and insight. Their study, therefore, is susceptible to the biases of self-reporting. Argenta et al, analyzed the visual attention of preschoolers to cartoons, *Sesame Street*, and situation comedies. They observed social interaction, viewing, and use of toys. With *Sesame Street* and situation comedies, attention was divided among social interaction, viewing, and toys. Only with cartoons did social interaction decrease. "The image of children mesmerized in front of the television set, forsaking social interaction and active involvement with their object environment, held true for only one type of programming, namely, cartoons" (Argenta et al., p. 370). Thus, findings will differ depending on how viewing is defined.

Another assumption is that incidental learning and intentional learning are separate during the television experience. Yet, if an adult reinforces or intervenes while coveiwng a program for children, intentional learning will increase. And if a child learns indirectly through informative programming, incidental learning will increase. The nature of the television experience today, especially with cable and videocassette recorder (VCR) technology, may be that incidental and intentional learning happen concurrently and may even interact or reinforce each other. Coveiwng with discussion may be a way to join incidental and intentional learning. In an article on "Family Contexts of Television," Leichter et al. (1985) point out that ways of representing and thinking about time may be learned from the television experience. Children can incidentally learn to recognize the hour or the day from the programming schedule. They can intentionally learn time concepts by watching Mister Rogers' *Neighborhood* and *Sesame Street*.

A methodological assumption underlying much research on the television viewing environment is the acceptability of self-reporting instruments and diaries. Although these techniques are valid, often they need to be compared with research results from other methodologies. This may be especially true in television research, because self-reporting techniques are used so extensively, particularly in studies on the family-viewing context.

11.5.3 The Television Viewing Environment

The television viewing environment is part of the television viewing system, which results in a television viewing experience. This section will next address several categories and subcategories of mediating variables starting with the viewing environment,

11.5.3.1. Number and Placement of Sets. Leichter and her colleagues (1985) discuss the temporal and spatial organization of the television viewing environment. According to Leichter et al., there are symbolic meanings associated with the placement of television sets in the home. In their discussion of the methodological approaches to the study of family environments, they stress the need “to obtain a detailed picture of the ways in which television is interwoven with the underlying organization of the family” (p. 31). They decided that ethnographic or naturalistic data gathering through a variety of observation techniques was best. Therefore, they used participant observation, interviewing, recording of specific behaviors, and video and audio recording of interactions. To gather data over a sufficient time span, one observer moved in with the family. Leichter and her colleagues generated research questions through a study of three families followed by a study of ten families. They compared the data generated with a similar cross-cultural study done in Pakistan (Ahmed, 1983) and concluded that placement varies with the architecture of the home and with family perceptions. As a result, a set can be “fixed” or “static” in terms of its placement, just as individual position for viewing can be fixed or static. The area of placement can be close to traffic patterns or places of activity, or it can be set in out-of-the-way places reserved just for viewing. Where the set is placed may lead to conflict because of other activities,

Even though television is a “magnet,” especially for young viewers, the physical design of the area where the set is placed can inhibit the amount of time spent viewing. This conclusion is supported by research on use of dormitory viewing areas in college (Preiser, 1970, cited in Ross, 1979). Young children engage in many other activities in the television area even if the television isn’t in a desirable location for other activities (Rivlin, Wolfe & Beyda, 1973, cited in Ross, 1979).

Winn (1977) argues that the television should be put in an out-of-the-way area such as the basement in order to minimize its dominance. Others argue that the more centrally located the set, the more likely viewers will be influenced by other powerful variables such as covieing.

One concept that could be used in research on placement is “household centrality,”* Medrich et al. (1982, cited in Comstock & Paik, 1991) proposed that families can be classified on a dimension reflecting behavior and norms* that favor viewing. If there is high use by parents and children and there are few rules governing viewing, the household can be said to have “centrality” of television. Research is

needed on the effect of placement of set(s) on centrality. Generally, if there is only one set, it is in a living or group recreational area. If there is a second set, it is usually placed in a bedroom (Leichter et al., 1985). The more central the location, the greater the likelihood that social interaction or covieing will mediate the effects of television.

The majority of households in the United States have two or more sets, subscribe to cable, and own a VCR (Huston et al., 1992). Children in multiple-set homes tend to watch more television than those in single-set homes (Webster, Pearson & Webster, 1986). Christopher, Fabes, and Wilson (1989) found that parents who owned one television set tended to exert more control over their children’s viewing than did parents owning multiple sets. They also found that parents who owned three or more sets were more positive about their children’s watching television and spent twice as much time watching as those with fewer sets. Webster et al. (1986) cautioned that multiple sets could lead to decreased parent-child interactions.

Since additional sets are used to resolve conflicts over program choices, children may view more since they have more control over their own viewing. In sum, one obvious guideline is that young children should not have access to more sets than parents can monitor. The experience of resolving conflicts over who watches what can provide valuable lessons in sharing.

11.5.3.2. Availability of Toys. Children develop strategies for viewing, including strategies that allow for competing activities, such as playing with dolls (Levin & Anderson, 1976). Rapid television pacing has no effect on the number of toys used during a play period (Anderson, Levin & Lorch, 1977). Family rules govern the placement and use of toys during viewing. Some families forbid toys in the television room; others permit toys to be available during viewing (Leichter et al., 1985). Where the set is placed may affect the use of toys during viewing. If the set is in the living room where no toys are permitted, the use of toys as distractors or reinforcers during viewing will be less than if the set is in the playroom or recreation room where toys and games are available,

The availability of toys may distract young children from the television set. In a study by Lorch, Anderson, and Levin (1979), when attractive toys were available to 5-year-olds, attention to Sesame Street dropped from 87% to 44%. One of the methods employed in the earliest research on Sesame Street was to conduct formative evaluation by having children watch a sequence while seated at a table filled with toys. If the children played with the toys rather than watching, the sequence was deemed ineffective in holding attention. Among these now classic studies were studies by Lesser in 1972 and 1974, and by Lorch and his colleagues in the late 1970s. When Lorch, Anderson, and Levin (1979) showed a version of Sesame Street to two groups, one group of children surrounded by toys and one group with no toys in the

environment, the children in the group without toys attended twice as much. However, there was no difference between the groups in comprehension of television content. Thus, toys may be seen as positive elements of the viewing environment in that they can reinforce viewing and provide a basis for interaction with others about television and other topics. On the other hand, toys can decrease attention, but this phenomenon does not seem to affect cognitive learning.

It is commonly believed that children learn about life through forms of play and social interaction (D. Winn, 1985). Although television can model prosocial forms of interaction, the time spent watching television results in less time for play, practice, and real interactions with other children or family members.

Television has no sign on it: "Trespassers will be prosecuted." Television is living made easy for our children. It is the shortest cut yet devised, the most accessible back door to the grown-up world. Television is never too busy to talk to our children. Television plays with them, shares its work with them, Television wants their attention, needs it, goes to any length to get it (Shayon, 1950, p. 9).

It is likely that children watching television in an environment rich with toys and the opportunity for other activities will not be as mesmerized by television programming. Opportunities for elaboration, interaction, and creativity that extend the effect of the television stimulus should be richer in such an environment. However, research is not available at this time to support such suppositions.

11.5.3.3. Relationship to Other Activities. Television impacts other activities, and other activities impact television. A study on television's impact conducted by Johnson in 1967 (cited in Liebert & Sprafkin, 1988) showed that of those surveyed, 60% changed their sleep patterns, 55% altered meal times, and 78% used television as an electronic babysitter. Liebert and Sprafkin also cite a study by Robinson in 1972 that showed reductions in sleep, social gatherings away from home, leisure activities, conversation, household care, and newspaper reading.

Television is frequently secondary to other activities, or there is frequently another activity even when viewing is primary (Comstock, Chaffee, Katzman, McCombs & Roberts, 1978). Krugman and Johnson (1991) report that compared to traditional programming, VCR movie rental is associated with less time spent on other activities.

Parental mediation and the incorporation of other activities as adjuncts to the viewing process may be beneficial for children. Friedrich and Stein (1975) concluded that when adults provide discussion after viewing or read storybooks that summarize important concepts conveyed in programming, children increase their understanding of concepts and are able to generalize them to new situations better than children not provided with summaries. Singer, Singer, and

Zuckerman (1981) reached the same conclusion when they had teachers lead discussions following viewing of prosocial programs.

Some families engage in orienting activities prior to viewing that lead to awareness of program options. According to Perse (1990), heavy viewers tend to use television guides and newspaper listings to select programs. They reevaluate during exposure by grazing* (quickly sampling a variety of programs using zapping* techniques with remote controls) while they are viewing.

Some studies have shown that television viewing reduces time devoted to other activities (Murray & Kippax, 1978; Williams, 1986). Murray and Kippax collected data from three towns in Australia: a no-television town, a low-television town, and a high-television town. The low-television town was defined as one receiving television for only 1 year, and the high as one receiving television for 5 years. Comparisons between the no-television town and the low-television town showed a marked decrease in other activities for all age levels when television was available. Television led to a restructuring of children's time use (Murray & Kippax, 1978; Himmelweit, Oppenheim & Vince, 1958, cited in Comstock & Paik, 1994). The displacement theory discussed in the section on school achievement attempts to explain the relationship of other activities to television viewing in the family context.

11.5.3.4. Rules for Viewing. The National Center for Educational Statistics conducted the National Education Longitudinal Study (NELS) of 1988. The study surveyed 25,000 eighth-graders, their parents, principals, and teachers. A follow-up study was undertaken in 1990 when the same students were tenth-graders. Results of these surveys are given in two reports (National Center for Education Statistics, 1991; Office of Educational Research and Improvement, 1991). According to these reports, "69% of parents reported monitoring their eighth-grader's television viewing, 62% limited television viewing on school nights, and 84% restricted early or late viewing" (National Center for Educational Statistics, 1992, p. 1). These statistics are not as reassuring as one would hope.

Two-thirds of the parents reported they did enforce rules limiting television viewing, while the same number of students reported their parents did not limit their television viewing. In fact, these eighth-graders spent almost 4 times as much time watching television each week as they did doing their homework (Office of Educational Research and Improvement, Fall 1991, p. 5).

Generally, research does not support the myth that children watch more television because their parents are absent. Even parents who are present rarely restrict children's viewing. The older the child, the less influence the parents have (Pearl, 1982). This pattern is disturbing in light of evidence that heavy viewers (4 hours a day or more) do less well in school and have fewer hobbies and friends (Huston et al.,

1992). Gadberry (1980) did an experimental study in which parents restricted 6-year-olds to about half their normal viewing amount. When compared with a control group whose viewing was not restricted, the treatment group improved in cognitive performance and time spent on reading.

Parents who are selective viewers are more likely to encourage or restrict viewing and to watch with their children. Parents who believe television is a positive influence watch more television with children (Dorr et al., 1989). The least-effective position for parents to take is a *laissez-faire* one, because children whose parents neither regulate or encourage viewing watch more adult entertainment television, usually without an adult present. This puts children more at risk from the negative effects of television (Wright, St. Peters & Huston, 1990).

Lull (1990) describes the many roles television can play in family interaction. The roles are structural (time and activity cues) or relational (facilitation of either shared communication or avoidance of communication and demonstration of competence or authority). Thus, television is an important variable in how family members relate to each other. Using surveys, Bower (1988) has compared parents' use of rules for viewing in 1960, 1970, and 1980. The results indicated a trend toward an increase in the restrictions and prescriptions parents impose on viewing. This increase in rules about amount of viewing and hours for viewing was indicated for 4- to 6-year-olds and 7- to 9-year-olds. For younger children, this also included an increase in rules about changing the channel or "grazing." Bower found that the higher the educational level of parents, the more likely there were rules about viewing. This confirms the findings of Medrich et al., who also found that the likelihood of rules increased with parental education for all households, but African-American households at every socioeconomic level were less restrictive about television viewing (Bower, 1985; Medrich, Roizen, Rubin & Buckley, 1982, cited in Comstock & Paik, 1991).

Several studies discuss the effects of new - technology, such as cable and VCRs, on parental restrictions. These studies are reviewed by Comstock and Paik (1991). Lin and Atkin (1989) found that several variables interact with rulemaking* for adolescent use of television and VCRs, including school grades, child media ownership, child age, and gender. They point out the difficulty in separating the research on rulemaking, parental mediation, and covieing.

Within this realm of parental guidance, the relationship between mediation and rulemaking is, itself, worthy of separate consideration. Few researchers have considered mediation (e.g., encouraging, discouraging, discussing viewing) apart from the notion of rulemaking (established guidelines about acceptable and/or prohibited behaviors). Those making mediation-rulemaking distinctions (Brown & Linne, 1976; Reid, 1979; Bryce & Leichter, 1983) found a fair degree of correspondence between the two. Although these two concepts may appear as indicators of the same

general process, we maintain that they should be theoretically distinguished. Actual mediation isn't necessarily contingent upon established rules. Clearly, one can have mediation without making explicit rules (and vice versa) (Lin & Atkin, 1989, p. 57).

Still Lin and Atkin found that mediation and rule making were predicted by each other,

There is also the question of whether information or training can increase parental involvement, Greenberg, Abelman, and Cohen provided television guides that reviewed programs to parents who did not use them. However, the children used them to find programs with the warning "parental discretion is advised" so that they could watch them (Greenberg, Abelman & Cohen, 1990, cited in Comstock & Paik, 1991). The jury is out, however, on whether training can help parents guide children in using television wisely. There are many books available for parents, including the Corporation for Public Broadcasting's *Tips for Parents, Using Television to Help Your Child Learn* (1988); the more recent American Psychological Association's (APA) "Suggestions for Parents" (Huston et al., 1992); Chen's *The Smart Parent's Guide to KIDS' TV* (1994a); and the USOE Office of Educational Research and Improvement publication *TV Viewing and Parental Guidance* (1994).

There has been little training of parents and almost no research on the effectiveness of such training. There have been many materials for television awareness training, such as critical-viewing teaching materials, which have been evaluated formatively. These will be discussed later in this chapter.

11.5.3.5. Parental Attitude and Style. Several studies found that parents did not mediate or enforce rules about television viewing because they did not believe television was either a harmful or beneficial force (Mills & Watkins, 1982; Messaris, 1983; Messaris & Kerr, 1983, cited in Sprafkin, Gadow & Abelman, 1992). There is some research that reports that a parent's positive attitude towards television is an important mediator (Brown & Linne, 1976; Bybee, Robinson & Turow, 1982; Dorr, Kovaric & Doubleday, 1989). In 1991, St. Peters, Fitch, Huston, Wright, and Eakins concluded that attitudes about television were correlated with parents' regulation and encouragement of viewing. The next year, they reported that parents' negative attitudes about television were not sufficient to modify the effects of television viewing. To reach their conclusions, the researchers collected data from 326 children and their families through diaries, questionnaires, standardized instruments, and one-way mirror experiments. This research led to a finer delineation of the variable "parental attitude" toward television:

Positive attitudes were positively associated with parents encouragement of viewing certain types of programs. Negative attitudes were positively related to regulating children's television viewing. Those parents who both regulated and encouraged discriminating viewing had children who viewed

less television than parents who were high on encouragement of viewing. However, the present analysis shows that while parents appear to criticize and regulate television's content because of its negative influence and coview violent programming (news and cartoons) with their children, parents may not be taking advantage of the opportunity to discuss the programs they watch with their children and moderate the effects of content either directly or indirectly. Parents' education and attitudes about television were not associated with children's social behavior towards others (St. Peters, Huston & Wright, 1989, p. 12).

Abelman found that parents who were more concerned with cognitive effects were more likely to discuss and criticize television content, whereas parents who were more concerned about behavioral effects were more likely to mediate by restricting viewing (Abelman, 1990, cited in Sprafkin, Gadow & Abelman, 1992). Earlier, Abelman and Rogers (1987) presented findings that compared the television mediation of parents of exceptional children. Parents of nonlabeled (no disability* identified) children were restrictive in style; parents of gifted children were evaluative in style; and parents of emotionally disturbed, learning-disabled, or mentally retarded children were unfocused in style. The actions of parents with restrictive styles included forbidding certain programs, restricting viewing, specifying viewing time, specifying programs to watch, and switching channels on objectionable programs. Parents with an evaluative style explained programs and advertising, evaluated character roles, and discussed character motivations and plot/story lines. Parents with an unfocused style were characterized by one or two of these actions: (a) coviewed with the child, (b) encouraged the use of a television guide, (c) used television as reward or punishment, and (d) talked about characters (Abelman & Rogers, 1987).

Singer and Singer and their colleagues have studied parental communication style as it interacts with television viewing and affects comprehension of television (Desmond et al., 1985, 1990; Singer, Singer & Rapaczynski, 1985, cited in Sprafkin et al., 1992). In a summary of these research findings, Desmond et al. (1990) suggest that "general family communication style may have been more critical than specific television rules and discipline for enhancing a range of cognitive skills, including television comprehension" (p. 302). Children are helped by an atmosphere that promotes explanation about issues instead of just comments on people and events. Similarly, Korzenny et al. conducted a study at Michigan State University to determine under what conditions children's modeling of antisocial portrayals on television was strongest. They found that parents who disciplined by reasoning and explanation had children who were less affected by antisocial content than children whose parents disciplined through power (Korzenny et al., 1979, cited in Sprafida et al., 1992).

11.5.4 Coviewing as a Variable

Coviewing refers to viewing in a group of two or more, such as a child and parent or three adolescent peers. Since discussion has been shown in many studies to be an important variable in learning from television (Buerkel-Rothfuss, Greenberg, Atkin & Neuendorf, 1982, cited in Comstock & Paik, 1991; Desmond, Singer & Singer, 1990), one would expect coviewing to be a significant variable in the home-viewing context. Unfortunately, studies suggest that although coviewing is an important variable, there are few effects due to coviewing. The reasons for this conclusion will be explained in this section. Three categories will be discussed: the nature and frequency of interaction, the effect of attitudes, and the effects of age and roles.

11.5.4.1. Nature and Frequency of Interaction. Based on a review of several articles, Comstock and Paik (1991) speculate that the time adolescents and adults spend coviewing is declining. The greatest concern in the literature is that most parents don't spend time coviewing, and when parents do coview, their level of involvement is usually low. It is not just the amount of time spent coviewing; the type of interaction during coviewing is critical. Most conversation during coviewing is about the television medium itself, the plots, characters, and quality of programs (Neuman, 1982, cited in Comstock & Paik, 1991). These conversations help educate young viewers and make them more critical. According to Comstock and Paik, however, they are not as crucial as conversations that deal with the reality of the program or the rightness or wrongness of the behavior portrayed.

The evidence suggests that parental mediation—when it employs critical discussions and interpretations of what is depicted and sets some guidelines on television use—can increase the understanding of television, improve judgments about reality and fantasy, and reduce total viewing (Comstock & Paik, 1991, p. 45).

Nevertheless, parental coviewing is not always a positive influence. Parents can give implicit approval to violence, prejudice, or dangerous behavior (Desmond, Singer & Singer, 1990, cited in Comstock & Paik, 1991). After surveying 400 second-, sixth-, and tenth-graders, Dorr, Kovaric, and Doubleday (1989, cited in Comstock & Paik, 1991) found that coviewing basically reflected habits and preferences, rather than parental mediation or conversational involvement. In 1989, Doff et al. reported only weak evidence for positive consequences from coviewing. They concluded that coviewing is an imperfect indicator of parental mediation of children's viewing. In their review, they identify several methodological problems that make it difficult to use the literature, including differing definitions of coviewing, overestimates by parents, and the assumption that coviewing is motivated by parents' desire to be responsible mediators of children's interactions with television. They report that

coviewing with young children is infrequent (Hopkins & Mullins, 1985, cited in Doff et al., 1989). Moreover, several studies have found that parent-child coviewing decreases as the number of sets in the house increase (Lull, 1982; McDonald, 1986, cited in Doff et al., 1989). Doff and her colleagues investigated several hypotheses about coviewing using data from seven paper-and-pencil instruments given to both parents and children. Their subjects included 460 middle-class second-, sixth-, and tenth-grade children and one parent for each of 372 of these children. The results indicated that coviewing by itself had little relationship to children's judgment of reality. It did predict satisfaction with family viewing.

Thus, research shows that most coviewing takes place because parents and children have similar viewing interests and tastes. Little of the coviewing has been planned by the parent to aid with the child's understanding and comprehension of the show (MacDonald, 1985, 1986, cited in Doff et al., 1989; Wand, 1968). Nevertheless, it is possible that coviewing may help parents deal with difficult issues. Through viewing scenarios on television, the child may discuss the television character's dilemma with a parent, or the child may simply accept the television portrayal as the appropriate solution.

11.5.4.2. Effect of Attitudes. Doff and her colleagues also found that parental attitudes toward television were predictors of coviewing. Parents who were more positive coviewed with children more frequently. Coviewing also correlated moderately with parents' belief that children can learn from television and with parents' encouragement of viewing. They concluded that it has a greater effect when motivated by parents' determination to mediate television experiences. This is an important finding, because coviewing occurs least with those who need it most, young children. Children are willing to discuss television content with their parents. Gantz and Weaver (1984) found that children initiate discussions of what they view with their parents; however, children did not initiate discussions about programs unless the programs were coviewed.

11.5.4.3. Effect of Age and Roles. Coviewing is usually described in terms of whether the viewers are children, adolescents, or adults, and whether the social group is of mixed age or not. The usual roles referred to are siblings, peers, and parents.

Haefner and Wartella (1987) used an experimental design to test hypotheses about coviewing with siblings. By analyzing verbal interactions in coviewing situations, they determined that relatively little of the interaction helped younger children interpret the content. Some teaching by older siblings did occur but was limited to identifying characters, objects, words, and filmic conventions. The result was that older siblings influenced evaluation of characters and programs in general, rather than interpretation of content. Haefner and Wartella (1987) noted that other variables needed

to be accounted for, such as gender, birth order, viewing style, and attitude, because they could affect differences in learning from siblings. Pinon, Huston, and Wright (1989) conducted a longitudinal study of family viewing of Sesame Street using interviews, testing sessions, and diaries with 326 children from ages 3 to 5 and 5 to 7. The presence of older children was found to reduce viewing, the presence of younger children to increase it. Alexander, Ryan, and Munoz (1984, cited in Pinon et al., 1989) found that younger children imitated the preferences of older children and that coviewing with older siblings promoted elaboration of program elements.

Salomon (1977) conducted an experimental study on mothers who coviewed Sesame Street with their 5-year-olds. He found:

Mothers' co-observation significantly affected the amount of time that lower-SES children watched the show, as well as their enjoyment of the program, producing in turn an effect on learning and significantly attenuating initial SES differences. Co-observation effects were not found in the middle-class group, except for field dependency performance where encouragement of mothers accentuated SES differences (p. 1146).

Salomon speculated that the performance of lower-class children is more affected, because the mother as coviewer acts as a needed energizer of learning.

On the other hand, television viewing activity may restrict parent-child interaction. Gantz and Weaver (1984) reviewed the research on parent-child communication about television. They used a questionnaire to examine parent-child television viewing experiences. They report conflicting research, some of which revealed a decrease in family communication, and some of which revealed facilitation of communication. Generally, they found that when parents and children watched together, conversations were infrequent. Moreover, there seems to be a socioeconomic variable interacting with coviewing, because more effective mediation of the viewing experience occurs with higher socioeconomic and educational levels. When viewing occurs with the father present, he tends to dominate program selection (Lull, 1982, cited in Gantz & Weaver, 1984).

Hill and Stafford (1980) investigated the effect of working on the time mothers devote to activities such as childcare, leisure television viewing, and housework. The addition of one child increased the time devoted to housework by 6 to 7 hours a week. Mothers who worked took this time from personal care time, including sleep and television watching. Because early childhood may be an important time for the establishment of long-term patterns of television use, it becomes essential that parental patterns of viewing continue to include coviewing with children, even when family routine mandates changes.

Collett (1986) used a recording device to study coviewing. The device, a C-Box,* consisted of a television set and video camera that recorded the viewing area in front of the television. In addition, subjects were asked to complete a diary. He points out that:

It is a sad fact that almost everything we know about television has come from asking people questions about their viewing habits and opinions, or from running them through experiments. The problem with asking people questions is that they may not be able to describe their actions reliably, or they may choose to offer accounts which they deem to be acceptable to the investigator (p. 9).

In 1988, Anderson and Collins examined the research literature on the relationship between coviewing by parents and critical-viewing skills programs, school achievement, and learning outcomes. The review concluded that there was little support for most of the beliefs about the negative influence of television on children. This opinion contrasts to some extent with conclusions of Haefner and Wartella (1987) and Winn (1977). Anderson and Collins concluded that adults can be helpful to children's comprehension through coviewing, but that it is not clear that interactions are common.

11.5.5 Viewing Habits

Another factor in the family viewing context is the viewing habits or patterns of the household. Because television viewing is often a social as well as a personal act, viewing habits both effect and are affected by other family variables. The factors that seem to emerge from research on viewing habits are the amount of viewing, viewing patterns, and audience involvement.

11.5.5.1. The Amount of Viewing. So far research related to this variable centers around the effects of heavy viewing. Estimates for the typical number of hours television is watched in the American home each day vary from 7 hours (Who are the biggest couch potatoes?, 1993) to 21 hours (Would you give up TV for a million bucks?, 1992). Those over age 55 watched the most; teenage girls, who averaged 3 hours a day, watched the least (Who are the biggest couch potatoes?, 1993). If heavy viewing is defined as more than 3 to 4 hours a day, many Americans are heavy viewers, which makes it difficult to research and draw conclusions about heavy viewing. Research does indicate that heavy viewing is associated with more negative feelings about life, Adults who watch television 3 or more hours daily are twice as likely to have high cholesterol levels as those who watch less than an hour daily, according to Larry Tucker, director of health promotion at Brigham Young University, who examined the viewing habits of 12,000 adults.

Children who are heavy viewers often have parents who are heavy viewers, Such parents are usually less educated and enforce fewer family rules about appropriate programs (Roderick & Jackson, 1985). The amount of viewing changes

over a life span. Teenagers are relatively light viewers when compared with children and adults (Comstock & Paik, 1987). Some studies reported that children of mothers who work outside the home watch no more or less television than children of mothers at home (Webster, Pearson & Webster, 1986; Brown, Childers, Bauman & Koch, 1990); yet Atkin, Greenberg, and Baldwin (1991) summarized research that concluded that children view more in homes where the father is absent (Brown, Bauman, Lenz & Koch, 1987, cited in Atkin, Greenberg & Baldwin, 1991) and where the mother works (Medrich, Rozien, Rubin & Buckley, 1982, cited in Atkin, Greenberg & Baldwin, 1991).

Using a questionnaire, Roderick and Jackson (1988) identified differences in television viewing habits between gifted and nongifted viewers. More nongifted students were found to have their own television sets, which may account for the heavier viewing habits of nongifted students. Gifted students preferred different programs (educational, documentaries) from nongifted students (sitcoms, soaps, game shows). Gifted students were more likely to have VCRs in their home. They did not engage in the wishful thinking or fantasizing about television characters that was common with nongifted students, Roderick and Jackson had nongifted students respond in their classrooms and gifted students respond at home, which may have introduced bias.

The CPB participated in the 1993 Yankelovich Youth Monitor in order to answer some questions about viewing patterns in the 1990s (Corporation for Public Broadcasting, 1993). The Youth Monitor survey studied 1,200 children ages 6 to 17 with an in-home interview in randomly selected households, Today 50% of children have a television set in their bedroom. They watch 3 hours per weekday and 4 hours per weekend day. Less than 20% watch an hour or less per day. Viewing decreases as income increases. African-American and Hispanic children view the most. Television viewing is the number- 1 activity in the hours between school and dinner time. Nearly half the children reported viewing television with their family each evening. This is especially true for children who watch public television.

11.5.5.2. Viewing Patterns. "Viewing patterns" refers to content preferences, but content does not dictate viewing, because, with few exceptions, other variables have more effect on preferences. This concept can be misleading, because, although there are few discernable patterns of preferences by program types, viewers would be unlikely to watch test patterns or the scrolling of stock market reports. Research supports the conclusion that viewers are relatively content indifferent,* Huston, Wright, Rice, Kerkman, and St. Peters (1990) conducted a longitudinal investigation of the development of television viewing patterns in early childhood, focusing on types and amounts of viewing from ages 3 to 7. They were interested in developmental changes resulting from maturation or cognitive development, individual and environmental variables affecting viewing patterns, and the

stability of individual differences in viewing patterns over time. Viewing was measured from diaries kept by parents who were instructed to record as a viewer anyone who was present for more than one-half of a 15-minute interval when the television was on. While there were many individual differences, these differences tended to be stable over time. As they grew older, children watched programs that required more cognition, such as programs with less redundancy and increasing complexity. Nevertheless, the researchers concluded that family patterns and external variables are more important determinants of viewing than individual or developmental differences. They also found that boys watched more cartoons, action-adventure, and sports programs than did girls. Boys watched more television overall. Viewers of humorous children's programs evolve into viewers of comedy at a later age. Viewers of adventure stories become viewers of action-adventure by age 7. In comparison to this study, Lyle and Hoffman (1972, cited in Comstock & Paik, 1991) documented through questionnaires that preferences change with age.

Plomin, Corley, DeFries, and Fulker (1990) conducted a longitudinal study of 220 adopted children from age 3 to 5. Evidence for both significant genetic and environmental influences on television viewing patterns was found. Neither intelligence nor temperament was responsible for this genetic influence.

McDonald and Glynn (1986) examined adult opinion about how appropriate it is for children to view certain kinds of content. Telephone interviews were conducted with 288 respondents. Adults did not approve of crime-detective and adult-oriented programming for children.

Over 4 years, Frank and Greenberg (1979) conducted personal interviews with 2,476 people aged 13 years or older. They found support for their thesis that viewing audiences are more diverse than usually assumed. From the information collected, they constructed profiles of 14 segments of the television audience. Their study is an example of research that clusters variables. More of such research is needed, because so many variables interact in the television environment.

11.5.5.3. Audience Involvement. Research shows that selectivity and viewing motives can affect viewing involvement (Perse, 1990). Using factor analysis techniques with data generated from questionnaires, Perse investigated viewing motives classified as ritualistic* (watching for gratification) or instrumental* (watching for information). The study included four indications of audience involvement: (a) intentionality, or anticipating television viewing; (b) attention, or focused cognitive effort; (c) elaboration, or thinking about program content; and (d) engaging in distractions while viewing. Ritualistic television use, which indicates watching a broad variety of programs, is marked by higher selectivity before watching but lower levels of involvement while viewing. The study confirms the value of the Levy-Windahl Au-

dience-Activity Typology (Levy & Windahl, 1985, cited in Perse, 1990).

The Experience Sampling Method* was used to study media habits and experiences of 483 subjects aged 9 to 15 years (Kubey & Larson, 1990). Respondents carried electronic paging devices, and whenever contacted, they reported on their activities and subjective experiences. The utilization of three new forms of video entertainment (music videos, video games, and videocassettes) and traditional television was subsequently analyzed. Traditional television viewing remains the dominant video media form for preadolescents and adolescents, New video media are a relatively small part of their lives, However, the percentage of time spent alone with the new media is growing, perhaps because they offer chances for adolescents to be more independent of the family. Boys had more positive attitudes towards the new media. There could be many reasons for this, including gender differences or the content of the new media,

11.5.6 Summary and Recommendations

In 1978, Wright, Atkins, and Huston-Stein listed some characteristics of the setting in which a child views television:

- Presence of others who are better informed or who can answer questions raised by a child
- Behavior of others, who through well-timed comments and questions model elaboration of content
- Preparation of the child through previous reading, viewing, or discussion
- Opportunity to enact or rehearse, role play plots, characters, and situations viewed
- Distractions in the environment

Much is known today about each of these aspects of the family viewing context. In addition, new variables and interactions have been identified such as rulemaking, parental communication style, socioeconomic level, and ethnicity.

Nevertheless, many gaps exist in the research literature, especially about interactions. The well-supported conclusion that learning from television increases when an adult intervenes to guide and support learning even if the program is an entertainment (Johnston, 1987) suggests that much more needs to be done to relate the findings of mass-media research and research from instructional television and message design. Therefore, it is essential to relate findings about learning from television with findings about the family context for viewing* in order to design interventions that will ensure the positive benefits of television. Findings need to be related theoretically in order to develop recommendations for interventions,

St. Peters et al. (1991) summarize the situation:

Whatever the effects of parental covieing, encouragement, and regulation, it is clear that the family context is

central to the socialization of young children's television use. Families determine not only the amount of television available to children, but the types of programs, and the quality of the viewing experience (p. 1422).

11.6 ATTITUDES, BELIEFS, AND BEHAVIORS

Since the early days of broadcast television, educators, parents, and legislators have been concerned about the effects of televised messages on the socialization of children. In 1987, a Louis Harris poll indicated that more than two-thirds of the adults surveyed were concerned about the effects of television on the values and behaviors of their children (Huston et al., 1992). Attention has also been directed to television's potential for cultivating prosocial behavior.* The cause-effect relationship between televised violence and violent behavior has not been conclusively supported by the research literature. Although there have been significant correlations in certain groups, such as those predisposed to aggressive behavior, the effects cannot be easily generalized to all children. As reported in the section on family viewing context, there are many mediating variables that influence the effects of television on attitudes and behaviors.

As in other areas of television research, methods vary between laboratory experiments, field studies, and surveys. Variables studied can include subject characteristics such as age, sex, ethnicity, socioeconomic status (SES), aggressive tendencies or predispositions, parental style, or amount of viewing. Other studies focus on the type of content that is presented, such as realistic, rewarded, or justified aggression. Still other studies focus on the influence of the physical and social context by manipulating variables such as parental approval (Hearold, 1986). More complex interactions may exist among these variables as well. Outcomes can be measured through observing spontaneous play, and through teacher and peer ratings, or through monitoring the intensity of responses that presumably produce pain. Treatments and behaviors can be delineated as antisocial, prosocial, or neutral,* As defined, each of these categories encompasses many variables,

During the 7 hours per day that the television set is typically turned on, it plays a subtle role as a teacher of rules, norms, and standards of behavior (Huston et al., 1992). This section will examine how television can impact beliefs and attitudes (see Chapter 34). It will also look at issues of desensitization, oversensitization,* and disinhibition.* Finally, it will review what has been learned about the effects of television on both antisocial and prosocial behavior,

11.6.1 Major Theories

Socialization is the process of learning over time how to function in a group or society. It is a set of paradigms, rules, procedures, and principles that govern perception, attention, choices, learning, and development (Dorr, 1982). Although

there have been hundreds of studies that examine socialization effects, a consistent theoretical basis is lacking. Social learning theory, catharsis theory,* arousal or instigation theory, and cultivation theory are commonly cited when researchers examine the effects of television on attitudes, beliefs, and behaviors.

11.6.1.1. Social Learning Theory. Many studies of television effects are based on Bandura's social learning theory, which "assumes that modeling influences operate principally through their informative function, and that observers acquire mainly symbolic representations of modeled events rather than specific stimulus-response associations" (Bandura, 1971, p. 16). According to Bandura and Walters (1963), the best and most effective way to teach children novel ways of acting is to show them the behavior you want them to display. Children can imitate modeled behaviors almost identically (Bandura, Ross & Ross, 1961). Bandura (1971) states that although much social learning is fostered through observation of real-life models, television provides symbolic, pictorially presented models. Because of the amount of time that people are exposed to models on television, "such models play a major part in shaping behavior and in modifying social norms and thus exert a strong influence on the behavior of children and adolescents" (Bandura & Walters, 1963, p. 49).

Bandura and others conducted a series of studies known popularly as the "Bobo doll studies." In each of them, a child was shown someone assaulting a Bobo doll, a 5-foot-tall inflated plastic clown designed to be a punching bag. In some experiments, the model was in the room; in others, a film of either the model or a cartoon figure was projected onto a simulated television (Bandura, Ross & Ross, 1961, 1963; Liebert & Sprafkin, 1988). Different treatment groups saw the model receiving different consequences. A model acting aggressively was either rewarded, punished, or received no consequences. Some groups saw a nonaggressive model. After exposure, the children were observed playing with toys while their spontaneous imitative aggressions were counted by trained observers.

The results showed that (a) children spontaneously imitated a model who was rewarded or received no consequences; (b) children showed far more aggression than children in other groups when they observed an aggressive model who was rewarded; (c) children showed little tendency towards aggression when they saw either the aggressive model who was punished or a nonaggressive model who was inhibited; and (d) boys showed more imitative aggression than girls (Bandura, Ross & Ross, 1961, 1963; Bandura & Walters, 1963; Liebert & Sprafkin, 1988). Bandura found that children can learn an aggressive behavior but not demonstrate it until motivated to do so. After children were told they would receive treats if they could demonstrate what they had seen, children in all treatment conditions, even those who saw the model punished, were able to produce a high rate of imita-

tion (Liebert & Sprafkin, 1988; Sprafkin, Gadow & Abelman, 1992; Wolf, 1975).

Although these studies provided evidence that modeled or mediated images can influence subsequent behavior, they are criticized for being conducted in laboratory conditions and for measuring play behavior toward a toy that was designed to be hit (Liebert & Sprafkin, 1988). Consequently, the results may not transfer to real-life situations. Environmental variables, such as parental approval or disapproval, also played an important role in eliciting or inhibiting aggressive behavior in naturalistic settings (Bandura, Ross & Ross, 1963).

11.6.1.2. Catharsis Theory. In contrast to social learning theory, catharsis theory suggests that viewing televised violence reduces the likelihood of aggressive behavior (Murray, 1980). The basic assumption is that frustration* produces an increase in aggressive drive, and because this state is unpleasant, the person seeks to reduce it by engaging in aggressive acts or by viewing fantasy aggressions such as those seen in action-adventure television (Sprafkin, Gadow & Abelman, 1992). Children who view violence experience it vicariously and identify with the aggressive action, thereby discharging their pent-up aggression (Murray, 1980).

Scheff and Scheele (1980) delineate two conditions needed for catharsis*: stimuli that give rise to distressful emotion and adequate distancing from the stimuli. They suggest that characters in violent cartoons may provide enough distancing and detachment for catharsis to occur, but realistic violence may be too overwhelming to feel and subsequently discharge.

Since catharsis involves a particular type of emotional response, viewing television may or may not elicit that response, depending on characteristics of the stimuli, viewers, and other conditions (Scheff & Scheele, 1980). Feshbach and Singer (1971) took a slightly different theoretical approach to their investigations of the relationship between fantasy aggression and overt behavior. They state that specific types of fantasies can cause either arousal, which leads to an increase in activity, or inhibition, which, in turn, leads to drive reduction. In looking at the effects of televised violence over a 6-week period, they studied approximately 400 boys who were divided into two treatment groups based on whether they watched aggressive or nonaggressive television. Feshbach and Singer found no significant differences between these groups. However, when they analyzed the data by type of residential school (private versus boy's home), they found that in the boy's home the nonaggressive television group became more aggressive, while the aggressive television group became less aggressive. When they analyzed private schools, they found the opposite to be true. Thus, the catharsis theory was supported in the boy's-home setting only. Other factors such as the boy's resentment of not being allowed to watch preferred programming may have been more influential than the nonaggressive television treatment. The

researchers also suggested that "violence presented in the form of fiction is less likely to reinforce, stimulate, or elicit aggressive responses in children than is violence in the form of a news event" (p. 158).

In general, catharsis theory has failed to receive support in studies on children (Liebert & Sprafkin, 1988) but has found support in studies on adolescents (Sprafkin, Gadow & Abelman, 1992). More research is needed on the effects on different populations. Scheff and Scheele (1980) cautioned that catharsis theory has never been adequately tested due to the lack of a careful definition and of systematic data collection. They recommended that studies be conducted that identify and separate viewers of violent programming who experience a cathartic emotional response from those who do not.

11.6.1.3. Instigation or Arousal Theory. Arousal theory* is related to catharsis theory only in its emphasis on an increase in a physiological state. But rather than reducing drives, this theory suggests that generalized emotional arousal can influence subsequent behaviors. Televised messages about emotion, sexuality, or violence can lead to "nonspecific physiological and cognitive arousal that will in turn energize a wide range of potential behaviors" (Huston et al., 1992, p. 36). For example, increased aggression following televised violence would be interpreted as the result of the level of arousal elicited by the program, not as a result of modeling (Liebert & Sprafkin, 1988). In over a dozen studies, Tannenbaum (1980) varied the content in film clips to include aggressive, sexual, humor, music, and content-free abstract symbols and movement. He compared subjects who viewed more-arousing (using physiological measures) though less-aggressive (in content) film clips to those who viewed less-arousing, more-aggressive clips. Subjects were required to make some form of aggressive or punitive response, usually the administration of alleged electric shocks. The subjects could only vary the intensity, frequency, or duration of the shocks. Tannenbaum found more aggression after subjects had seen the more-arousing though less-aggressive films. He cautions, however, that a necessary feature of these studies was a target (the researcher's accomplice) who had earlier angered the subjects and may have been considered as deserving an aggressive response.

This theory suggests that when aroused, people will behave with more intensity no matter what type of response they are called upon to make (Tannenbaum, 1980). An important implication of this theory is that behavior may be activated that is quite different from what was presented (Huston et al., 1992). Thus, arousal may stimulate a predisposition towards aggression.

Arousal levels can be measured by pulse amplitudes, a type of heart response measured by a physiograph (Comstock & Paik, 1991). With this method the measurement of effects is not influenced by extraneous factors, such as observer bias or counting errors,

11.6.1.4. Cultivation Hypothesis or Drip versus Drench Models. Cultivation theory (see 4.4.4.4) “predicts that the more a person is exposed to television, the more likely the person’s perceptions of social realities will match those represented on television ...” (Liebert & Sprafkin, 1988, p. 148). In other words, a person’s view of the world will be more reflective of the common and repetitive images seen on television than of those actually experienced (Signorielli, 1991; Signorielli & Lears, 1992).

Television may influence viewers by the “drip model,” the subtle accumulation of images and beliefs through a process of gradual incorporation of frequent and repeated messages (Huston et al., 1992). George Gerbner conducted a number of studies that demonstrated a cultivation effect; he found that individuals who watch greater amounts of television and therefore see more crime-related content develop beliefs about levels of crime and personal safety that reflect those risks as portrayed on television (Gunter, 1987).

Greenberg (1988, cited in Williams & Condry, 1989) asserted that critical images that stand out or are intense may contribute more to the formation of impressions than does the frequency of images over time. Huston et al. also found support for the “drench model” where single programs or series may have a strong effect when they contain particularly salient portrayals. For example, programs designed to counteract stereotypes,* such as *The Golden Girls*, can change children’s attitudes and beliefs about older women.

The “drip versus drench models” illustrate a common problem in theory building. Even though the drip model is associated with cultivation theory, neither model explains the cognitive mechanisms that operate.

11.6.2 Attitudes and Beliefs

Television is just one of many sociological factors that influence the formation of beliefs and attitudes. Many of the poorest and most vulnerable groups in our society, such as children, the elderly, ethnic minorities, and women, are the heaviest users of television in part because it is used when other activities are not available or affordable (Huston et al., 1992; Stroman, 1991). In general, people with low incomes and with less formal education watch more television than people with high incomes and with higher education (Huston et al., 1992).

Liebert and Sprafkin (1988) reported that heavy viewers (those who watch more than 3 to 4 hours per day) are more likely than light viewers to have outlooks and perceptions congruent with television portrayals, even after controlling for income and education. They cautioned that some groups, such as adolescents with low parental involvement, are more susceptible than others. Huston et al. (1992) concluded that children and adults who watched a large number of aggressive programs also tended to hold attitudes and values that favored the use of aggression to resolve conflicts, even when

factors such as social class, sex-role identity, education level, or parental behavior were controlled (see 4.4.4.3).

The beliefs and attitudes learned from television can also be positive. Bandura and Walters (1963) stated that exemplary models often reflect social norms and the appropriate conduct for given situations. Children can acquire a large number of scripts and schemes for a variety of social situations based on television prototypes (Wright & Huston, 1983). Television can also impact children’s understanding of occupations with which they have no experience (Coin-stock & Paik, 1991). Viewing positive interactions of different ethnic groups on *Sesame Street* led to an increase in positive intergroup attitudes among preschool children (Gom, Goldberg & Kamungo, 1976, cited in Huston et al.) Unfortunately, many television producers continue to rely on stereotypes due to the desire to communicate images and drama quickly and effectively.

11.6.2.1. Stereotypes. A group is said to be stereotyped “whenever it is depicted or portrayed in such a way that all its members appear to have the same set of characteristics, attitudes, or life conditions” (Liebert & Sprafkin, 1988, p. 189). Durkin (1985) described stereotypes as being based on extreme characteristics attributed to the group, with usually negative values attached to that group. The less real-world information people have about social groups, the more inclined they are to accept the television image of that group. According to Gross (1991), nonrepresentation in the media maintains the powerless status of groups that possess insignificant material or power bases. He stated that mass media are especially powerful in cultivating images of groups for which there are few first-hand opportunities for learning.

Many studies assess stereotypes both quantitatively, with counts of how many and how often subgroups are portrayed, and qualitatively, with analyses of the nature and intent of the portrayals. “Recognition* refers to the frequency with which a group receives TV roles at all. Respect* refers to how characters behave and are treated once they have roles” (Liebert & Sprafkin, 1988, p. 187). Television can reflect and affect the position of groups in society, since the number and types of portrayals of a group symbolize their importance, power, and social value (Huston et al., 1992). For example, when Davis (1990) studied network programming in the spring of 1987, he concluded that television women are more ornamental than functional.

Huston et al. (1992) cautioned that “despite extensive documentation of television content, there is relatively little solid evidence about the effects of television portrayals on self-images, or on the perceptions, attitudes, and behaviors of other groups” (p. 33). As with other areas of television research, it may be too difficult to isolate the effects of television from other social effects. On the other hand, programs that are designed specifically to produce positive images of subgroups appear to be successful.

11.6.2.2. Gender Stereotypes. The effects of television in sex role* socialization is another area of concern (Signorielli & Lears, 1992). According to Durkin (1985), “The term sex role refers to the collection of behaviours or activities that a given society deems more appropriate to members of one sex than to members of the other sex” (p. 9). Television viewing is linked with sex-stereotyped attitudes and behaviors. Correlational studies show a positive relationship between amount of viewing and sex-stereotyped attitudes, and experimental studies demonstrate that even brief exposure to television can increase or decrease sexstereotyped behaviors, depending on the type of program viewed (Lipinski & Calvert, 1985).

In the United States, women are portrayed on television as passive, dominated by men, deferential, governed by emotion or overly emotional, dependent, less intelligent than men, and generally weak (Davis, 1990; Higgs & Weiller, 1987; Liebert & Sprafkin, 1988; Signorielli & Lears, 1992). The percentage of starring characters who are women is 30% (Kimball, 1986).

The formal features of television can contribute to stereotyping by gender. Commercials aimed at women used soft background music and dissolves, and employed female narrators primarily for products dealing with female body care (Craig, 1991; Durkin, 1985; Signorielli & Lears, 1992; Zemach & Cohen, 1986), even though male narrators were used in 90% of all commercials (Zemach & Cohen, 1986). Commercials aimed at men more often incorporated variation in scenes, away-from-home action, high levels of activity, fast-paced cuts, loud and dramatic music and sound effects, and fantasy and excitement (Bryant & Anderson, 1983; Craig, 1991; Durkin, 1985).

Presenting a group in a way that connotes low status deprives that group of respect (Liebert & Sprafkin, 1988). Women were typically assigned marital, romantic, or family roles (Liebert & Sprafkin, 1988) and were depicted in subservient roles allocated to them by a patriarchal society (Craig, 1991). They were rarely shown to successfully combine marriage and employment (Signorielli, 1991). Davis (1990) also found that the television woman’s existence was a function of youth and beauty. Women were younger than men by 10 years, and they disappeared from ages 35 to 50. They are 5 times more likely to have blond hair and are 4 times more likely to be dressed provocatively. They were also frequently defined by their marital or parental status.

Men were shown as major characters on average 3 times more often than women during prime time. A higher proportion of working women were portrayed in professional and entrepreneurial roles than actually existed. Furthermore, women rarely experienced problems with childcare, sex discrimination, harassment, or poverty (Huston et al., 1992).

Although many studies identified female role stereotypes, fewer examined male stereotypes and their characteristics

(Craig, 1991; Langmeyer, 1989). In general, men on television tended to be active, dominant, governed by reason, and generally powerful (Liebert & Sprafkin, 1988). Meyers (1980) examined how men were portrayed in 269 television commercials. Her analysis found four main characteristics: authoritative-dominant, competitive/success hungry, breadwinner, or emotionless male. Commercials aimed at men are more likely to “stress the importance of being capable, ambitious, responsible, and independent and physically powerful, and of seeking accomplishment, physical comfort, and an exciting and prosperous life” (Scheibe & Condry, 1984, cited in Craig, 1991, p. 11),

Craig (1991) found that portrayals differed according to the time of day. For example, daytime television commercials that were aimed at women portrayed men from the perspective of home and family. Men appeared in the home, were hungry, were potential partners for romance, were rarely responsible for childcare, and were portrayed as husbands or celebrities (Craig, 1991). During the weekends, ads were “replete with masculine escapist fantasy” (Craig, p. 53). Men were primary characters 80% of the time and appeared in settings outside the home. In contrast, women were completely absent in 37% of the ads, and when they did appear, it was as sex objects or models 23% of the time.

In examining effects, heavy television viewing was associated with stronger traditional sex role development in boys and girls (Comstock & Paik, 1991; Gunter, 1986; Murray, 1980; Liebert & Sprafkin, 1988). Signorielli and Lears (1992) found a significant relationship between heavy television viewing and sex-stereotyped ideas about chores for preadolescent children. They found that children who watched more television were more likely to say that only girls should do the chores traditionally associated with women, and only boys should do those associated with men. Jeffery and Durkin (1989) found that children were more likely to accept a sex role transgression (i.e., a man doing domestic chores) when the character was presented as a powerful executive than when he was shown as a cleaner/custodian. When Kimball (1986) studied three Canadian communities, she found that 2 years after the introduction of television, children’s perceptions relating to sex roles were more sex typed than before television was available. Although she recognized the influence of peers, parents, school, and other media, she concluded that the introduction of television to the Notel town added enough of an effect to produce an increase in sex stereotyping. Additionally, Bryant and Anderson (1983) reported that viewing public television (which contained less stereotyping than commercial television) was characteristic of children who made less stereotypical toy choices,

According to Dambrot, Reep, and Bell (1988), the role played by an actor or actress was more critical to viewers’ perceptions than their sex. In their study examining crime action shows, they found that “viewers ascribe masculine

traits to both female and male characters” (p. 399). When women were portrayed in nontraditional roles and situations, viewers did not attribute traditional stereotyped traits to them.

Hansen and Hansen (1988) studied the effect of viewing rock music videos on perception. Subjects who viewed stereotypic music videos were more likely to have a distorted impression of an interpersonal interaction than were subjects who viewed neutral videos. Although research on the effects of sex role portrayals suggests a link to beliefs about gender roles, Gunter (1986) cautioned that many studies do not account for other variables, such as the effect of parental role modeling, nor do they precisely measure what viewers actually watch,

Even in sports programming, television reinforced stereotypes (Higgs & Weiller, 1987; Weiller & Higgs, 1992). Commentators described men as strong, aggressive, and unstoppable. They used surnames and provided technical information about male athletes. On the other hand, in the limited coverage of women’s sports, women were described by their pain and the difficulty of the competition, by their first names, and with derisive adjectives, such as “the best little center” in basketball (Higgs & Weiller, 1992, p. 11).

On a positive note, television altered expectations when it purposely deviated from stereotypic portrayals in order to change beliefs (Comstock & Paik, 1987; Gunter, 1986). Johnston and Ettema (1982) conducted summative evaluations of *Freestyle*, the 13-part public television program designed to change attitudes about sex roles among children aged 9 to 12. Their study included four experimental conditions spread among seven research sites. Although limited positive effects were seen with unstructured viewing, positive short-term and long-term effects were seen when the program was viewed in the classroom and discussion took place (Comstock & Paik, 1987; Durkin, 1985). Effects with home viewers were small and were found only for the heaviest viewers. Among female children who viewed the programs in school, however, there were significant changes in beliefs, attitudes, and interests. While there were few changes in boys’ beliefs, attitudes, or interests, there were no cases of negative effect on males or females (Johnston & Ettema, 1982, cited in Johnson, 1987). The program was particularly successful in promoting greater acceptance of: (a) girls who displayed independence and abilities in athletics, mechanical activities, and leadership; (b) boys who were nurturing; and (c) men and women who chose nontraditional roles (Gunter, 1986; Johnston & Ettema, 1982). Overall, Johnston and Ettema concluded that the programs could impact children’s beliefs and attitudes more than their interests in nontraditional pursuits.

11.6.2.3. Minority Stereotypes. The effects of television on beliefs and perceptions related to ethnicity have not received as much attention as those related to sex roles (Comstock & Paik, 1991). Because children are less likely to have contact with people of different racial or ethnic back-

grounds, television may be the primary source of information about minorities (Takanishi, 1982; Williams & Condry, 1989). By 2080, Caucasians in the United States will no longer be the majority (Fitzgerald, 1992). In response to the United States being more racially integrated than at any other time in history, television is becoming more racially diverse,

According to Huston et al. (1992), television is particularly important for African-Americans because they watch more, have more favorable attitudes towards it, rely more on it for news and information, and perceive it as reflecting reality. Additionally, young, well-educated African-American adults are heavy viewers. Also, television may provide minority children with important information about the world that is not available to them in their immediate environment (Stroman, 1991); therefore, the effects may be greater.

Minority children on average spent more time watching television regardless of socioeconomic status (Comstock & Cobbe, 1982; Dorr, 1982) and ascribed more reality or credibility to television portrayals (Dorr, 1982). Stroman cited a study by Lee and Browne (1981) that reported that 26% of third- and fourth-graders and 15% of adolescents watched more than 8 hours of television per day. Since their families were less able to afford alternative forms of entertainment, African-American children relied more on television for entertainment and guidance and to learn about occupations (Stroman, 1991). The successful image of African-Americans on television was as far removed from reality as were negative portrayals (Wilson & Gutierrez, 1985, cited in Fitzgerald, 1992).

In the early days of television, African-Americans appeared in minor roles, frequently as servants or as comedians (Liebert & Sprafkin, 1988). According to Williams and Condry (1989), in the 1970s racism was more subtle, Black characters were younger and poorer, less likely to be cast in professional occupations, and dramatic or romantic roles, and often appeared in segregated environments. From their study of 1,987 network programs and commercials, they concluded that minorities were portrayed with blue-collar or public-service jobs, appeared as children, or appeared as perpetrators or victims of criminal and delinquent acts.

Ethnic identity* is the “attachment to an ethnic group and a positive orientation toward being a member of that group (Takanishi, 1982, p. 83). Children are particularly vulnerable to negative portrayals of African-Americans. “Black children are ambivalent about their racial identity, and studies still show that many prefer whites, prefer to be white, and prefer white characters on television to characters like themselves” (Corner, 1982, p. 21). Graves (1982) cited several studies that demonstrated that preschoolers imitated televised Caucasian models more than African-American models, even when imitating toy selection. Other variables could be contributing to these studies, however. The results could be interpreted as relating more to the perceived status of the models than to their ethnicity (Comstock & Cobbe, 1982).

Although he criticized situation comedies for their portrayals of African-Americans as frivolous and stupid, Corner (1982) commented that these programs helped Caucasian third- through fifth-graders gain positive images of minorities, and many African-American children gained positive images about themselves. Graves (1982) found positive effects, including the acceptance and imitation of minority role models. Additionally, Mays and colleagues (1975) found that after viewing 16 episodes of *Vegetable Soup*, a program that featured the interactions of children of different ethnic backgrounds, children from 6 to 10 years expressed greater friendliness towards those differing in ethnicity (cited in Comstock & Paik, 1991). Mays and colleagues also found that those who were African-American expressed enhanced acceptance of their own ethnicity. Takahashi (1982) and Greenberg and Atkin (1982) cautioned that the effects of minority character portrayals were complicated by the different values, attitudes, and characteristics that children bring to viewing, as well as by social influences and the attributes of content.

According to Davis (1990) and Berry (1982), minority group portrayals have improved in terms of frequency. In 1987, African-Americans comprised 12.4% of television characters and 12.9% of the population (Davis, 1990). Although African-Americans were appearing more on television, segregation and isolation continued to be a problem (Berry, 1982). In 1980, cross-racial interactions appeared in only 2% of dramas and 4% of comedies (Weigel, Loomis & Soja, 1980, cited in Liebert & Sprafkin, 1988). In their study of 1987 network programming, Williams and Condry found that 40% of minorities were in segregated environments with no contact with whites. They did find an interesting trend in that cross-racial friendships among youth were commonplace. In contrast, they found that cross-racial relationships among adults were limited to job-related situations.

Audience-viewing patterns have the potential to counteract the negative effects of televised stereotypes. Greenberg and Atkin (1982) stated that African-American parents were more likely than Caucasian parents to sit down and watch television programs with their children, especially minority programs. Grayson (1979) and Stroman (1991) advised direct intervention by parents to reduce the impact of negative portrayals, including: (a) selectively viewing programs and excluding those that portray minorities in distorted or stereotyped roles; (b) looking for and covieing programs that portray minorities in a positive, realistic, and sensitive manner; (c) viewing and discussing the program's applicability and relevance to real-life people and events; (d) providing exposure to content beyond television and to activities that will promote physical and intellectual growth, such as trips to zoos and museums; and (e) providing opportunities for children to be in real situations with minorities, elderly persons, and others.

Other minority groups were rarely portrayed. By the mid-1970s other subgroups complained to the networks about their portrayals, such as Arabs as terrorists or oil sheiks; Italians as Mafia hoodlums; Orientals as invaders, docile launderers, or karate experts; Chicanos/Hispanics as comics, banditos, or gang members; homosexuals as effeminate; and Native Americans as savages, victims, cowards, or medicine men (Davis, 1990; Williams & Condry, 1989; Willis, 1990). Relatively little is known about how television is used by other minority groups.

11.6.2.4. Elderly Stereotypes. As a group, the elderly have been under-represented on television, occupying no more than 3% of all roles (Bell, 1991; Huston et al., 1992; Liebert & Sprafkin, 1988). Of that number, men outnumbered women two to one and were likely to be more powerful, active, and productive. In a study of children's Saturday morning programs, Bishop and Krause (1984) found that over 90% of the comments made about the elderly were negative (cited in Liebert & Sprafkin, 1988). The elderly were also portrayed as unhappy and having problems they could not solve themselves. According to Davis and Davis (1986), they were shown as "more comical, stubborn, eccentric, and foolish than other characters. They are more likely to be treated with disrespect" (cited in Bell, 1991, p. 3).

This image of the elderly may be changing as the media recognize that one out of every six Americans is over 60 years of age, and marketing decisions begin to incorporate the elderly into television's prime time (Bell, 1991). According to Nielsen ratings, in 1989 the five most popular dramas for the over-age-55 audience featured older characters: *Murder She Wrote*, *The Golden Girls*, *Matlock*, *Law and Order*, and *In the Heat of the Night* (Bell, 1991). Bell found that they portrayed elderly who were at the center of the show as powerful characters, affluent, healthy, physically and socially active, quick witted, and admired. He concluded that while the elderly were portrayed better than they had been in the past, there were still problems. "When men appear with women, the old stereotypes of male prominence and power still operate" (Bell, 1991, p. 11). In his observation, these shows depicted two worlds: one where there were older women but no men, and one where there were older men with young women but no older women.

Some evidence exists for the potential of television to promote positive outcomes regarding the elderly. Keegan (1983) found that a planned program, *Over Easy*, which was designed to reach viewers over 55 years, was effective in fostering positive attitudes about aging (cited in Huston et al., 1992). Effects of images of the elderly need to be researched further and on different populations.

11.6.2.5. Disability Stereotypes. According to the World Health Organization, disability is defined as "any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being" (cited in Cumberbatch & Negrine,

1992, p. 5). Television tends to concentrate on the disability rather than on the individual aspects of the character portrayed. People with disabilities wish to be treated as ordinary people on television, not as superheroes or villains or with sentimentality. Cumberbatch and Negrine (1992) studied televised images of disability on programs produced in Great Britain from 1988 to 1989 and compared them to shows produced in the United States. By recording and coding 1,286 programs, they found that characters with disabilities were shown to have locomotor, behavioral, or disfigurement disabilities since these are visible, "The wheelchair has apparently become a ready symbol of the experience of disability, a shorthand for a variety of difficulties that someone suffering from disabilities may encounter" (Cumberbatch & Negrine, p. 136). They concluded that in feature films, characters with disabilities were stereotyped most commonly as criminals, as being barely human, or as powerless and pathetic. In British programs, they were portrayed as villains, moody, introverted, unsociable, or sad. In the United States, however, characters with disabilities were shown more positively and were more likely to be sociable, extroverted, moral, and nonaggressive. Research on the effects of portraying characters with disabilities is needed.

11.6.2.6. Sensitization and Inhibition Issues. In addition to effects on stereotyping, studies suggest that some modeled behaviors can desensitize viewers, oversensitize viewers, or temporarily remove inhibitions (disinhibition effect). Variables include how victims' responses are portrayed as well as the type of behavior exhibited, Stein (1972) found that emotional arousal on exposure to violence declined with repeated exposure, but it was unclear if behavioral responses also declined (cited in Friedrich & Stein, 1973).

Repeated exposure to specific types of violent programming, especially sexual violence and sports, may result in some viewers becoming desensitized or disinhibited. Although exposure to erotic content does not appear to induce antisocial behavior,* research on sexual violence suggests that it can reinforce certain attitudes, perceptions, and beliefs about violence toward women (Huston et al., 1992). After seeing sexual assault modeled, men behave more punitively toward women than those shown sexual intimacy without aggression (Donnerstein, 1980, cited in Bandura, 1986).

Showing women experiencing orgasmic pleasure while being raped stimulates greater punitiveness than if they are depicted expressing pain and abhorrence. Depictions of traumatic rape foster less aggression even though they are as arousing and more unpleasant than depictions of rape as pleasurable (Bandura, 1986, p. 295).

Bandura also states that since sexual modeling serves as a source of arousal and disinhibition, it can also heighten aggressiveness. Both male and female viewers who were massively exposed to pornography

... regard hard-core fare as less offensive and more enjoyable, they perceive uncommon sexual practices as more prevalent than they really are, they show greater sexual callousness toward women, they devalue issues of importance to women, and they are more lenient toward rape offenses (Zillmann & Bryant, 1984, cited in Bandura, 1986, p. 294).

Although broadcast television is usually sexually suggestive rather than explicit, cable channels and videotape rentals can make violent and explicit sexual images readily available to children, Huston et al. (1992) call for more research to be done regarding the impact of these materials on children, Bandura (1986) expresses concern that while society exercises control over injurious actions, it presents discontinuities in the socialization of and boundaries for sexual behavior,

Although some viewers may become desensitized or disinhibited by what they watch on television, other viewers may become oversensitive, Television may cultivate or intensify distorted perceptions of the incidence of crime in the real world, especially for heavy viewers (Gunter, 1987; Gunter & Wakshlag, 1988; Murray, 1980; NIMH, 1982). Heavy viewers may think the world is more dangerous than it really is and perceive that the world is a mean and scary place (Liebert & Sprafkin, 1988). This may be the result of a circular effect where "greater fear of potential danger in the social environment may encourage people to stay indoors, where they watch more television, and are exposed to programmes which tell them things which in turn reinforce their anxieties" (Gunter & Wakshlag, 1988, pp. 208—209).

On the other hand, programs, such as crime dramas in which the antagonists end up being punished, can have the countereffect of providing comfort and reassurance in a just world (Gunter & Wakshlag, 1988). Gunter and Wober (1983) found a positive relationship between beliefs in a just world and exposure to crime drama programming (cited in Gunter, 1987).

The amount of viewing may be less important than the types of programs watched, the perception of and interpretation of content, and the actual level of crime where people live (Gunter, 1987). More detailed analyses are needed before causal conclusions can be drawn. Disinhibition effects that lead to increased aggressive behavior have also been observed. In a study conducted by Bandura and Walters (1963), experimental subjects were instructed to administer electrical shocks (simulated) to individuals who gave incorrect responses. In this study, subjects who were exposed to aggressive content (a scene of a knife fight) administered stronger electrical shocks than did their counterparts who were shown constructive or neutral films (Liebert & Sprafkin, 1988). They cautioned that many of the laboratory studies that supported disinhibition occurred in contrived circumstances with television segments that were taken out of con-

text. They also found a trend for disinhibition effects among those who are initially more aggressive.

Some evidence exists that disinhibition also occurs when violence is viewed in real-life settings. For adults, disinhibition may be a factor in the increase in violence against women that occurs after football games. White, Katz, and Scarborough (1992) studied the incidence of trauma after National Football League games. Although Walker found that calls to women's shelters increased on the day that a team lost (cited in Nelson), White et al. found that women were more likely to be hospitalized for trauma from assaults on the day after a team won. They concluded that violence against women may be stimulated by some aspect of identification with an organization that dominates through violent behavior, "In a domestic context, the example of being successful through violent behavior may provide the male viewer with a heightened sense of power and may increase domination over his spouse or partner. This feeling of power can act to disinhibit constraints against violence" (White et al., p. 167). Additionally, calls to women's shelters increased in the first 4 to 5 hours after a Super Bowl game, with more calls being reported in some cities than on any other day of the year (Nelson, 1994). The director of a domestic abuse center stated that when men describe battering incidents that involve sports, "the men talk about being pumped up from the game" (p. 135). Other variables, such as intoxication, may confound these data.

11.6.3 Behaviors

A substantial body of research has been conducted relative to the positive and negative effects of television on behavior. Behavior patterns that are established in childhood and adolescence may affect the foundations for lifelong patterns that are manifested in adulthood (Huston et al., 1992). According to Wright and Huston (1983), "producers, advertisers, and broadcasters use violence in children's programming largely because they believe that dramatic content involving anger, aggression, threat, and conquest is essential to maintain the loyalty and attention of child audiences" (p. 838). The research on formal features has suggested alternative ways of maintaining attention, such as with high rates of child dialogue, high pace, auditory and visual special effects, salient music, and nonhuman speech (Wright & Huston, 1983). According to Hearold (1986), whether what is learned is put to use depends on a variety of factors:

There must be the capability to perform the act, sufficient motivation, and some remembrance of what is viewed; performance also depends on the restraints present, including the perceived probability of punishment and the values held in regard to violence (p. 68).

Making definitive statements about the causes of behaviors or correlations between causes and effects is difficult because of inconsistencies in the labels for gross treatment effects. Antisocial and prosocial are broad terms that can rep-

resent diverse treatments or outcomes. There is also ambiguity in more specific terms such as frustration or aggression (Bandura & Walters, 1963).

In her meta-analysis of 230 studies that were conducted through 1977, however, Hearold (1986) made 1,043 treatment comparisons. Overall, she found a positive effect for antisocial treatments on antisocial behaviors and a positive effect for prosocial treatments on prosocial behaviors. When she looked at the most ecologically valid studies, Hearold found that effect sizes* continued to be positive, although they were lower. She cautions, however, that some of the differences may be understood by the intentionality of the treatments. For example, antisocial programs are generally created to entertain audiences, while prosocial programs have prosocial instruction as a goal. Other moderating variables can be the degree of acceptance of antisocial and prosocial behaviors.

11.6.3.1. Antisocial Outcomes. For decades, people have been concerned about the effect of television on antisocial behavior, particularly violence and aggression. Violence can be defined as "the overt expression of physical force against others or self, or the compelling of action against one's will on pain of being hurt or killed" (NIMH, 1972, p. 3). Aggression can be defined as an action intended to injure another person or object (Friedrich & Stein, 1973), but its designation as antisocial depends on the act as well as the circumstances and participants (NIMH, 1972). In observational studies, these antisocial acts include physical assault, nonverbal teasing, verbal aggression, commanding vigorously, tattling, injury to objects, and playful or fantasy aggression (Friedrich & Stein, 1973). Some laboratory studies use a "help-hurt" game in which the intensity, quantity, or length of pain-producing responses are measured when the subjects believe they are affecting another child or a researcher's accomplice.

Two decades of content analysis show that violence remains at approximately five violent acts per hour in primetime television and at 20 to 25 acts per hour in children's Saturday morning programming. This translates into an average of 8,000 murders and over 100,000 acts of violence viewed by the time a child graduates from elementary school (Huston et al., 1992).

In 1994—1995, the National Cable Television Association funded the National Television Violence Study that went beyond counting the number of violent incidents portrayed on television. It identified important contextual factors, examined the presence of effect of ratings or content advisories, and explored the effectiveness of antiviolence television messages and public service announcements (Mediascope, 1996). Important contextual conclusions included:

- Perpetrators were unpunished in 73% of all violent scenes,

- The negative consequences of violence were not often portrayed.
- Handguns were used in 25% of violent interactions,
- On premium cable channels, 85% of the programs were violent, compared to public broadcasting channels with 18%.
- Movies were more likely to present violence in realistic settings than other program types.
- Children's programs were least likely to show the long-term consequences of violence.
- Violence was shown in a humorous context in 67% of children's programs.
- Only 4% of violent programs employed an antiviolence theme,

The study also found that "viewer discretion" advisories and "PG- 13" or "R" ratings made programs more attractive for boys, particularly those aged 10 to 14, while the opposite was true for girls, especially those aged 5 to 9. Public service announcements and antiviolence programming were not effective in changing adolescents' attitudes about using violence to resolve conflict.

Antisocial outcomes have been shown to occur after exposure to antisocial programming. Although Huston et al. 's review of the literature stated that "there is clear evidence that television violence can cause aggressive behavior and can cultivate values favoring the use of aggression to resolve conflicts" (1992, p. 136), this statement should be treated with caution, because definitions of antisocial behavior, violence, and aggression can vary from study to study. Results can also vary depending on other variables such as age, sex, parenting style, or environmental cues. For example, Bandura and Walters' (1959) study of childrearing practices found that parents of aggressive boys were more likely to encourage and condone aggression than the parents of nonaggressive boys (cited in Bandura & Walters, 1963). A predisposition for aggressiveness may also be a catalyst that produces increases in mediated behavior (Murray, 1980). Comstock and Paik (1987) list others factors that have been identified as heightening television's influence or contributing to viewers' antisocial behavior, These include the portrayal of violence as: (a) justified, rewarded, uncriticized, unpunished, or seemingly legal; (b) violence resulting in numerous victims or mass killings; (c) violence among friends or gang members; (d) viewers who are angered or provoked prior to viewing; and (e) viewers who are in a state of frustration or unresolved excitement after viewing (Comstock & Paik, 1987).

The accumulated research shows a positive correlation between viewing and aggression, i.e., "heavy viewers behave more aggressively than light viewers" (Huston et al., 1992, p. 54). But when a correlation is made between viewing televised violence and aggressive behavior, it does not mean that there is a causal relationship. Alternative explanations are possible, such as those who are more predisposed to aggression tend to watch more violent television.

Although experimental studies, such as the Bandura Bobo doll studies, have shown that aggression can increase after exposure to televised violence, the research hasn't proved that aggression demonstrated in laboratory settings transfers to real-life settings. Field studies show conflicting results, and naturalistic studies are frequently confounded by uncontrollable environmental factors.

In an effort to find more precise answers, a major endeavor was sponsored by the Surgeon General of the United States to study the effects of television on social behavior with a focus on the effects of televised violence on children and youth (NIMH, 1972). From 1969 to 1971, 23 independent projects were conducted, a number of which were field studies that showed correlations ranging from .0 to .30 (Atkin, Murray & Nayman, 1971). The end result was a very cautious report that stated, "On the basis of these findings..., we can tentatively conclude that there is a modest relationship between exposure to television and aggressive behavior or tendencies ..."(NIMH, 1972, p. 8). Only two of the studies showed +30 correlations between earlier viewing and later aggression.

Finding positive correlations did not lead to statements of causality. The advisory committee cautioned that "a correlation coefficient of .30 would lead to the statement that 9% of the variance in each variable is accounted for by the variation in the other" (NIMH, 1972, p. 67). They also wrote, "The majority of the values are trivially small, but the central tendency for the values is clearly positive. En masse, they indicate a small positive relationship between amount of violence viewing and aggressive behavior..." (NIMH, 1972, p. 168). They speculated that the correlations could be the result of any of three causal sequences:

(a) viewing violence led to aggression, (b) aggression led to violence viewing, or that (c) both viewing and aggression were the products of some unidentified conditions, Such conditions could have included preexisting levels of aggression, underlying personality factors, or parental attitudes and behavior.

The committee found the experimental evidence to be weak and inconsistent, However, they felt there was a convergence of evidence for short-term causation of aggression among some children, but less evidence for long-term manifestations, They pointed out that the viewing-to-aggression sequence most likely applied to some children predisposed to aggressive behavior and that the manner in which children responded depended on the environmental context in which violence was presented and received (Atkin, Murray & Nayman, 1971—1972).

Overall, the Surgeon General's Advisory Committee concluded that there was a tentative indication of a causal relationship between viewing violence on television and aggressive behavior. Any relationship operated only on some children, those who were predisposed to be aggressive, and it operated only in some environmental contexts (NIMH, 1972).

In 1982, the NIMH published another report reviewing research conducted during the ensuing 10 years. In their summary, they concluded that the convergence of evidence supported the conclusion that there was a causal relationship between viewing televised violence and later aggressive behavior (NIMH, 1982). They cautioned that all the studies demonstrated group differences, not individual differences, and that no study unequivocally confirmed or refuted the conclusion that televised violence leads to aggressive behavior,

As stated earlier in this section, Hearold (1986) found similar results when she conducted a meta-analysis of studies conducted through 1977 which measured anti- or prosocial behavior or attitudes of subjects assigned to film or video treatment conditions. She included only those studies with valid comparison groups such as prepost comparison studies or those with control groups. Hearold found that the most frequently measured antisocial behavior was physical aggression, and concluded that positive findings have not been confined to a method, measure, or age group. While responses to television violence were undifferentiated by sex among young children under the age of 9, they became more differentiated with age as sex role norms were learned. Male-female differences were greatest for physical aggression in the later teen years when effect sizes for boys markedly increased, while those for girls decreased. When looking at outcome characteristics, Hearold found that physical aggression was a variable in 229 comparisons with a mean effect size of .31. She also found that when subjects were frustrated or provoked, the effect size increased (Hearold, 1986).

Other studies support the importance of individual predispositions and environmental contexts in predicting the negative effects of television. Because studying the effects of television in naturalistic settings is so complex, researchers called for a move away from determining if there are effects to seeking the explanations and processes responsible for causing effects (NIMH, 1982; Joy, Kimball & Zabrack, 1986). For example, Friedrich and Stein's (1973) study of 93 preschoolers found that children who were initially above average in aggression showed greater interpersonal aggression after exposure to aggressive cartoons than when exposed to neutral or prosocial programs. They also showed sharp declines in self-regulation such as delay tolerance and rule obedience. Children who were initially below average in aggression did not respond differently to the various treatment conditions,

In their longitudinal study, Joy, Kimball, and Zabrack (1986) found that after 2 years of exposure to television, children in the formerly Motel town were verbally and physically more aggressive than children in the Unitel and Multitel towns. They also found that boys were more aggressive than girls, and children who watched more television tended to be more physically aggressive. They speculate that this may

have been due to a novelty effect rather than a cultivation effect.

Special populations of children can react to and use television differently from their nondisabled peers. When Sprafkin, Gadow, and Abelman (1992) reviewed field studies conducted with emotionally disturbed and learning disabled children, they found that these children demonstrated more physical aggression after viewing control material or cartoons with low levels of aggression than did nonlabeled children. However, in laboratory studies of exceptional children they found that children who are naturally more aggressive are more likely to be reactive to televised violence. Other variables may have impacted the results, including the use of nonaggressive, but highly stimulating or suspenseful, treatment materials.

There also seems to be a relationship between heavy viewing and restlessness. Studies conducted by Singer and colleagues and Desmond and colleagues (1990) found positive associations between heavy television viewing and greater restlessness for children whose parents were not involved in covieing (cited in Comstock & Paik, 1991).

Most young children don't know the difference between reality and fantasy (NIMH, 1982). Some of the negative effects of violence and stereotypes may be attenuated if children can separate fiction from reality (Wright & Huston, 1983). Sprafkin, Gadow, and Dussault developed a test called the Perceptions of Reality on Television (PORT) to assess children's knowledge of the realism of people and situations shown on television (Sprafkin, Gadow & Abelman, 1992). It consists of showing a series of video excerpts about which children must answer questions. The PORT questions are based on judging the realism of aggressive content, nonaggressive content, and superhuman feats, on differentiating between the actor and the role played, and on differentiating between cartoons and nonanimated programs. PORT has been found to be a reliable and valid measure of children's perceptions of reality on television (Sprafkin, Gadow & Abelman, 1992). Research on the applicability of PORT to developing interventions in criticalviewing skills is needed.

At least three areas of concern arise from the literature on violence. The obvious ones are the relationship between television violence and aggression, even if the aggression is not directed against society, and the desensitization of children to pain and suffering (Smith, 1994). The less obvious one is the potential for effect on children who are sensitive and vulnerable and thus may become more fearful and insecure (Signorielli, 1991).

In response to these concerns, the United States Congress included in the Telecommunications Act of 1996 a requirement for television manufacturers to install an electronic device in every set that will be produced beginning in 1998. In order for this technology to work, the Telecommunications Act calls for programs to be rated and encoded accord-

ing to their level of sex and violence, This device, popularly referred to as the “V-chip,” enables parents to identify and block programming they determine is undesirable for their children (Telecommunications Act of 1996; Murray, 1995).

Alfred Hitchcock is reputed to have said, “Television has brought murder into the home, where it belongs” (Elkind, 1984, p. 103). Murders and crime occur about 10 times more frequently on television than in the real world. A third of all characters in television shows are committing crime or fighting it, most with guns. It becomes, therefore, a chicken-and-egg question. Does television programming include more violence because society is more violent, or does society become more violent because people are desensitized to violence through television? The answer is probably both. Too many factors interact for the extent of each influence to be determined,

When one examines violence in films the trend towards increased gore and explicit horror is easily documented. Rather than reflecting the content and meaning associated with myths and fairy tales, today’s horror films are pure sensation with no serious content. In that aspect, they reflect our times, when so many have lives of pure sensation (Stein, 1982, cited in Elkind, 1984). If violence on television is controlled, children and adults will still be able to experience violence vicariously through other media, such as film, books, and recordings. Research on television suggests that the messages sent about violence do have an effect, but many factors can mediate these effects.

11.6.3.2. Prosocial Outcomes. Although concerns about the negative effects of television are certainly valid, television also can be used to teach positive attitudes and behaviors. Prosocial behaviors include generosity, helping, cooperation, nurturing, sympathy, resisting temptation, verbalizing feelings, and delaying gratification (Friedrich & Stein, 1973; Rushton, 1982; Sprafkin, Gadow & Abelman, 1992). Liebert and Sprafkin (1988) divide prosocial behavior into two categories: altruism* — which includes generosity, helping, and cooperation—and self-control,* which includes delaying gratification and resisting the temptation to cheat, lie, or steal. However, children must be able to comprehend television content if prosocial messages are to be effectively conveyed.

Content analyses reveal an average of 11 to 13 altruistic acts per hour, 5 to 6 sympathetic behaviors, and less than 1 act of control of aggressive impulses or resistance to temptation (Liebert & Sprafkin, 1988). Although viewers are exposed to prosocial interpersonal behaviors, there are infrequent displays of self-control behaviors on television (Liebert & Sprafkin, 1988). Most of these prosocial behaviors appear in situation comedies and dramas.

In her meta-analysis, Hearold (1986) found 190 tests for effects of prosocial behavior. The average effect size for prosocial television on prosocial behavior (.63) was far higher

than that for the effects of antisocial television on antisocial behavior (.30) (cited in Liebert & Sprafkin, 1988). “The most frequently measured prosocial behavior, altruism (helping or giving) had one of the strongest associations, with a mean effect size of .83” (Hearold, 1986, p. 105). Other noteworthy average effect sizes included .98 for self-control, .81 for buying books, .57 for a positive attitude toward work, and .57 for acceptance of others (Hearold, 1986). Due to these large effect sizes, Hearold called for more attention to and funding for production of prosocial programs for children.

One such program is Mister Rogers’ Neighborhood, which has been lauded for its ability to promote prosocial behavior in preschool children. Field experiments showed that children increased self-control (Liebert & Sprafkin, 1988) and learned nurturance, sympathy, task persistence, empathy, and imaginativeness from viewing it (Huston et al., 1992). Positive interpersonal behavior was enhanced when viewing was supplemented with reinforcement activities such as role playing and play materials, especially for lower socioeconomic-status children (Huston et al., 1992; Sprafkin, Gadow & Abelman, 1992). After exposing children to 12 episodes of Mister Rogers’ Neighborhood over a 4-week period, Stein and Friedrich (1972, cited in Murray, 1980) found that preschool children became more cooperative and willing to share toys and to delay gratification than children who watched antisocial cartoons. Friedrich and Stein (1973) also found that preschoolers showed higher levels of task persistence, rule obedience, and delay tolerance than subjects who viewed aggressive cartoons. These effects of increased self-regulatory behavior were particularly evident for children with above-average intelligence. Paulson (1974) reported that children who viewed Sesame Street programs designed to portray cooperation behaved more cooperatively in test situations than did nonviewers,

Sprafkin (1979) compiled the following results of research on other prosocial programs: Sesame Street improved children’s racial attitudes towards African-Americans and Hispanics; Big Blue Marble caused fourth- through sixth-graders to perceive people around the world as being similar and “children in other countries as healthier, happier, and better off than before they had viewed the program” (p. 36); Vegetable Soup helped 6- to 10-year-olds become more accepting of children of different races; and finally, Freestyle helped 9- to 12-year-olds combat sex role and ethnic stereotyping in career attitudes,

Commercial television programs that reach larger audiences can also promote prosocial behavior. First-graders who viewed a prosocial Lassie episode were more willing to sacrifice good prizes to help animals seemingly in distress than a control group (Sprafkin, Liebert & Poulos, 1975, cited in Sprafkin, Gadow & Abelman, 1992). Children who viewed the cartoon Fat Albert and the Cosby Kids understood its prosocial messages and were able to apply them (Huston et al., 1992; Liebert & Sprafkin, 1988). Anderson and Will-

iams (1983, cited in Stroman, 1991) found that after African-American children viewed an episode of *Good Times*, the children reported that they learned that street gangs are bad and that family members should help each other. Television can also explain to children how to handle fearful events, such as going to the dentist, or demonstrate that frightening situations aren't so bad (Stroman, 1991).

Forge and Plemister (1982) sought to determine whether a prosocial cartoon would be as effective as a live-model prosocial program. Forty preschool aged children were shown one of four different 15-minute videotapes. Subjects were then observed during 30 minutes of free play. The prosocial cartoon was as effective as the live-model program in eliciting prosocial behavior.

Unfortunately, some commercial superhero cartoons and crime/adventure programs may deliver prosocial or moral messages via characters who behave aggressively. Lisa, Reinhardt, and Fredriksen (1983, cited in Liebert & Sprafkin, 1988) used episodes of the cartoon *Supeifriends* to compare a prosocial/aggressive condition to a purely prosocial condition. In their study of kindergarten, second-, and fourth-grade children, subjects were put in a situation where they could hurt or help another child within the context of a help-hurt game. They found that children exposed to a purely prosocial condition helped more than they hurt, tended to hurt less, and understood the plot and moral lesson significantly better than those in the prosocial/aggressive condition. Liebert and Sprafkin concluded that prosocial behavior should not be presented in an aggressive context.

Prosocial television has its critics, too. There are "legitimate moral objections to using a public medium to indoctrinate socially a whole nation of children" (Liebert & Sprafkin, 1988, p. 240). When Liebert and Sprafkin assisted with the production of an internationally broadcast public-service announcement that modeled cooperation by showing children sharing a swing, they were accused of trying to manipulate children's behavior and moral values and were told that their efforts could potentially be seen as "a highly objectionable form of psychological behavior control" (p. 243).

Although television can influence children and does so in an indiscriminate manner, an important question is whether anyone should purposely try to harness its power for specific socialization goals. Even so, Hearold (1986) makes a good point:

Although fewer studies exist on prosocial effects, the effect size is so much larger, holds up better under more stringent experimental conditions, and is consistently higher for boys and girls, that the potential for prosocial effects overrides the smaller but persistent negative effects of antisocial programs (p. 116),

11.6.4 Summary and Recommendations

Television can teach and change attitudes, values, beliefs, and behaviors, especially those considered prosocial. The beneficial effects of prosocial programming, especially for adolescents and adults, needs to be explored further.

Child-rearing practices are also a factor, Korzenny, Greenberg, and Atkin (1979, cited in Sprafkin, Gadow & Abelman, 1992) found that children of parents who disciplined with reasoning and explanation were less affected by antisocial content; children of parents who disciplined with power were most affected.

Many studies looked at behavior immediately following exposure to a short program. As research continues in these areas, it is important to examine the long-term and cumulative effects of exposure to television on attitudes, beliefs, and behaviors. As Schramm, Lyle, and Parker (1961) stated:

For some children, under some conditions, some television is harmful. For some children under the same conditions, or for the same children under other conditions, it may be beneficial. For most children, under most conditions, most television is probably neither particularly harmful nor particularly beneficial (cited in Hearold, p. 68).

It is also important to continue to identify those variables in the home, school, and society that are more important than television in the socialization of children. Rushton speculates that "television has become one of the most important agencies of socialization that our society possesses (1982, p. 255). Many of the studies on socialization were based on content analyses, and detailed information was available about what was being portrayed (NIMH, 1982). Since television does appear to affect the world view of heavy users, research is needed to determine the long-term effects on viewers' attitudes, beliefs, and behaviors. Television violence can "work in subtle and insidious ways to adversely influence youth and society" (Liebert & Sprafkin, 1988, p. 135).

Although laboratory experiments do show a positive correlation between television violence and antisocial behavior, naturalistic studies are not as clear. In terms of causation, it appears that some populations in specific settings are sometimes affected. Many other factors—such as the characteristics of the viewers, friends and family, and environment—influence television effects. Research is moving away from determining if there is a relationship to determining the causes and nature of that relationship: "The concern is more with the kinds of violence, who commits violence, and who is victimized, because these portrayals may be critical mechanisms of social control" (NIMH, 1982, p. 41). It should be remembered that inferences of causation in violence studies are based on numerous correlational studies. One example of an area that should yield fruitful research is the interaction between formal features and the effects of television on aggression. If, as research indicates, aggression increases in

the presence of specific formal features such as fast-paced action, regardless of the violence of the content, then researchers need to explore such interactions,

The television industry has recognized that it needs to play an active role in attempting to curb youth violence. In 1994, the Corporation for Public Broadcasting (CPB) partially funded “The National Campaign to Reduce Youth Violence.” The goals of the campaign were (a) to focus on successful, community-based solutions, (b) to collaborate with multiple community resources and organizations, and (c) to involve youth in the problem-solving process (Head, 1994). Over an initial 2-year period, it hopes to have provided technical assistance with telecommunications services, two program series, and accompanying outreach programs. This campaign was designed to involve television, print, radio, government agencies, and community, educational, and industrial organizations. The purpose of the campaign is to identify and support interventions to counter the effects of violence on television,

11.7 PROGRAMMING AND UTILIZATION

We now turn to programming and its effects and to utilization studies. This section will critically review:

- Programming for preschoolers
- Programming for classrooms
- Programming for subject-matter teachers
- News programs
- Advertising on television
- Utilization studies

11.7.1 PROGRAMMING FOR PRESCHOOLERS

11.7.1.1. Mister Rogers’ Neighborhood. Fred Rogers has stated that television can either facilitate or sabotage the development of learning readiness. According to Rogers, for a child to be ready to learn, the child must have at least six fundamentals: (a) a sense of self-worth, (b) a sense of trust, (c) curiosity, (d) the capacity to look and listen carefully, (e) the capacity to play, and (f) times of solitude. Television can help children develop the sense of uniqueness essential to their self-worth, or it can undermine this sense of uniqueness by teaching children to value things rather than people and by presenting stereotyped characters (Rogers & Head, 1963).

Rogers’ program to develop learning readiness is the longest-running series on public television. Its goals are affective in that the programs are designed to increase self-esteem and valuing of self and others. Research shows that the program is successful in achieving these goals (Coates, Pusser & Goodman, 1976). Research has also shown that the program uses almost exclusively positive reinforcement to accomplish this goal (Coates & Pusser, 1975).

In 1992, McFarland found that the program helped childcare teachers and providers enhance the emotional development of preschool children. Parents had positive attitudes toward the use of quality children’s programming in childcare. She found that while the behavior of adult childcare providers could be positively affected by watching Mister Rogers’ Neighborhood, there were ambiguous effects for children’s behavior. She concluded that Fred Rogers provided positive modeling that helped childcare providers to develop attitudes and behaviors that enhance the emotional development of preschool children. McFarland used a three-part study that included surveys, observations, and written feedback. Part 2 of the study used the programs plus accompanying materials for 5 months. To some extent, the success of the program is due to the use of supplementary materials, such as books, puppets, and tapes of songs on the show. Research has not determined the role of such materials in the instructional effectiveness of the program.

One issue that has been pursued in the research is the comparative effect of Sesame Street and Mister Rogers’ Neighborhood on attention span. Studies on the effects of pacing on attention span are equivocal. Children who watched an hour of fast-paced programming were compared with children who watched an hour of slow-paced programming. No significant differences were found in effects on attention or perseverance. Two other studies showed that children who watched typical children’s programming had increased impulsiveness and reduced perseverance. In another study, children who watched the slow-paced Mister Rogers’ Neighborhood were found to be increasingly persistent in preschool activities (Anderson & Collins, 1988; Friedrich & Stein, 1973, cited in Huston et al., 1992). Anderson, Levin, and Lorch (1977) found no evidence that rapid television pacing had a negative impact on preschool children’s behavior. Nor did they find a reduction in persistence or an increase in aggression or hyperactivity. Their research was an experiment using slow-paced and rapid-paced versions of Sesame Street, followed by a free-play period in a room full of toys.

11.7.1.2. Sesame Street. In a series of classic studies of cognitive learning, Bogatz and Ball (1970, 1971) found that children who watched the most, learned the most, regardless of age, viewing or geographic location, socioeconomic status, or gender. Not only did children who watched gain basic skills in reading and arithmetic, they also entered school better prepared than their nonviewing or low-viewing peers. Encouragement to view was found to be an important factor in viewer gains. Paulson (1974) did an experiment to determine whether children learned social skills from watching. When tested in situations similar to those presented on the program, children who watched learned to cooperate more than children who did not. Reiser and his colleagues conducted two studies (1988, 1984) and concluded that cognitive learning increased when adults who watched Sesame Street with children asked them questions about letters and numbers and gave feedback.

More recent research on the relationship of viewing by preschool children to school readiness has been reported (Zill, Davies & Daly, 1994). Zill et al. used data from the 1993 National Household Education Survey to determine who viewed the program and how regularly. Data from the survey were also examined to determine the relationship between viewing and (a) literacy and numeracy in preschool children, and (b) school readiness and achievement for early elementary students. The study found that the program reached the majority of children in all demographic groups including the “at risk” children. The findings revealed:

- Children of highly educated parents stopped watching the program earlier than children of less-educated parents.
- Children from disrupted families were more likely to watch the program.
- Children whose parents did not read to them regularly were less likely to watch the program.
- Children from low-income families who watched television showed more signs of emerging literacy than children from similar families who did not watch.
- Children who watched the program showed greater ability to read and had fewer reading problems in first and second grade.
- First- and second-graders who watched the program did not show less grade repetition or better academic standing.

The established value of Sesame Street for children in poverty is reviewed by Mielke (1994). In an article for a special issue of *Media Studies Journal* on “Children and the Media,” he argued that the program is reaching and helping low-income children who have a narrower range of educational opportunities in the critical preschool years and that therefore it should be an important element in a national strategy for reaching our educational goals by the year 2000.

Recent research on CTW’s educational programming is summarized in several documents that can be obtained from their research division, including:

- “Sesame Street” Research Bibliography 1989—1994 (Petty, 1 994a)
- A review of “Sesame Street” Research 1989—1994 (Petty, 1 994b)
- “Sesame Street” Research Bibliography: Selected Citations to “Sesame Street” 1969—1989 (Research Division, CTW, June 1990)

The first of these documents provides an annotated bibliography. The second is a report of research in the areas of:

(a) educational, cognitive, and prosocial implications; (b) effects of nonbroadcast materials; (c) formal features and content analyses; and (d) Sesame Street as stimulus material for other investigations. The third is also an annotated bibliography, but it covers research done both nationally and internationally.

11.7.1.3. Cartoons. Much of the discussion about the effects of cartoon programming has centered around the extent to which children of different ages assume that the fantasy presented in such shows is real. Fictional characters vary from realistic portrayals to superheros and heroines. The photographic and dynamic qualities of television can make characters seem real. Children were shown photographs of television cartoon characters intermixed with photographs of familiar real people. Then, children were given tasks and asked questions designed to reveal their beliefs about these characters. There were 70 boys ages 5 to 12 participating. All the boys attributed unique physical characteristics to the characters, but the younger children generalized this uniqueness to other characteristics. For example, they believed a superhero could live forever because he was strong, or that he was happy because he could fly. Older children described the characters more realistically and were aware that physical ability doesn’t ensure happiness. The study concluded that young children may miss important traits and consequences because visual effects heighten the physical dimension (Ferne, 1981, cited in Meringoff et al., 1983).

One of the problems with research on cartoons is that it is commonly done and reported within the Saturday morning children’s programming context. A cartoon is typically a fantasy program with humor, mayhem, action, and drama. However, today realism is often mixed with animation, and there are many types of content represented in cartoons for children. Furthermore, religious training or calculus lessons can be put within an animated format that will influence children differently than will a Saturday morning entertainment cartoon. There has been much debate about whether cartoons are violent. All of these questions suggest that it is difficult to generalize from the research, because content becomes as important as format, and often these two variables are not separated, nor is their interaction studied,

11.7.2 Programming for Classrooms

After 40 years, the collective evidence that film and television can facilitate learning is overwhelming. This evidence is available for all forms of delivery, film, ITV, ETV, and mass media. It is reinforced by evaluation of programming prepared for these formats and delivered by newer delivery systems such as cable and satellite. The next section will review recent representative examples of this body of research. The section will be organized by these topics: general findings; video production*; educational series programming, including Children’s Television Workshop productions; programming for subject-matter areas; satellite programming; and utilization studies,

11.7.2.1. General Findings. The findings reported here are the ones that are most important for further research. In 1993, Katherine Cennamo critiqued the line of investigation initiated by Gavriel Salomon in the 1980s, with his construct of amount of invested mental effort, or AIME, Cennamo

posed the question: Do learner's preconceptions of the amount of effort required by a medium influence the amount of effort they invest in processing such a lesson and consequently the quantity and quality of information they gain? Factors influencing preconceptions of effort required and actual effort expended were found to include characteristics of the task, media, and learners. In her summary, she noted that, in general, learners perceive television as a medium requiring little mental effort and believe they learn little from television. However, learners reported attending more closely to educational television programs than to commercial programs. The topic of the program also influenced preconceptions. She stated that in actuality, learning from television may be more difficult than learning from a single-channel medium because of its complexity. Learners achieved more from a lesson they were told to view for instructional reasons than from a lesson they were told to view for fun. This is consistent with many other findings about the importance of intentional use of the medium to help children learn, such as those reported in the Reiser et al. (1988, 1984) Sesame Street studies, which concluded that children learn more when an adult is present to guide and reinforce learning.

It is important to identify the types of learning that programs are designed to facilitate and the types of learning for which television can be used most effectively. Cennamo (1993) points out that the types of achievement tests used may not reveal mental effort or achievement in intended areas. For example, tests of factual recall cannot document increased mental effort or inferential thinking. Beentjes (1989) replicated Salomon's study on AIME and found that Dutch children perceived television to be a more difficult medium to learn from than did the American children in Salomon's study.

In 1967, Reid and MacLennan reviewed 350 instructional media comparisons and found a trend of no significant differences when televised instruction was compared to face-to-face instruction. However, their analysis of other uses of video instruction yielded different conclusions:

When videotapes were used in observation of demonstration teaching, teacher trainees gained as much from video observations as from actual classroom visits. In addition, when used in teaching performance skills—such as typing, sewing, and athletic skills—films often produced a significant increase in learning and an improvement in student attitudes (Cohen, Ebeling & Kulik, 1981, p. 27).

Another general finding is that the potential for television's effectiveness is increased when teachers are involved in its selection and utilization, and when teachers are given specialized training in the use of television for instruction (Graves, 1987). Teachers can integrate television in the curriculum, prepare students, extend and elaborate on content, encourage viewing, and provide feedback. They do this best if they themselves are prepared. If a distinction is made between television as a stand-alone teacher and television's

capacity to teach when used by a teacher, the evidence indicates that although television can teach in a stand-alone format, it can teach more effectively when utilized by a competent teacher (Johnson, 1987). We turn now to the effects of specific programming used in classroom settings.

11.7.2.2. Film/Video Production. Interest in the effects of production experience on students (see 9.7.3.3) started many years ago. In the early 1970s students learned how to produce Super 8-mm films. With easy access to half-inch videotape and portable equipment, they ventured into producing video. Since cable television has made more equipment, facilities, and training available, there has been an increase in video production by schools for educational purposes. Nevertheless, students have been producing programs for class assignments and school use since the 1960s. It is surprising, therefore, that there is very little research on the effects of video production by students on learning and attitudes. This may be due to the fact that most researchers are in university settings, and most video production is in school buildings, or to the difficulty of controlling variables in a field setting. Nevertheless, the effects of video production and the variables that mediate these effects are not being investigated. It may be that the strongest effects related to learning from television come from student productions, because the strongest commitment and identification is possible in these cases,

The Ford Foundation funded studies related to learning from film and television production. One such study reported on the effects of filmmaking on children (Sutton-Smith, 1976). Subjects attended a workshop on filmmaking. The researchers used the workshop to determine (a) the processes through which children of the same or different ages proceeded in the acquisition of filmmaking mastery, and (b) the perceptual, cognitive, and affective changes that resulted in the children. Observation, videotaping, and interviews were used for documentation. One interesting finding was that there were striking differences between younger and older children in filmmaking, despite repeated instruction in the same areas.

Young children tended not to make:

- Establishing shots
- Films about a major character
- Films about a group of characters
- Multiple scenes
- Markers in films (titles, ends, etc.)
- Story themes
- Story transitions
- Causal linkages
- Use of long shots, close-ups, pans, zooms, or changes in camera position
- Long films (18 seconds versus 65 seconds for older children)

Children 5 to 8 years old were considered young, and children 9 to 11 constituted the older group. It would be interesting to replicate this study today, because sophistication with the television code could generate different results,

Tidhar (1984, cited in Shutkin, 1990) researched the relationships between communication through filmmaking and the development of cognitive skills in children. She compared classes who studied scenario design, photography, and editing in different combinations and concluded that necessary mental skills for decoding film texts are developed during film production.

Those who encourage students to produce video assert that the process teaches them goal setting, creative problem solving, cooperative learning, interpersonal skills, and critical analysis skills. In addition, they claim the experience improves a student's self-esteem and self-concept. Furthermore, they contend that students who have trouble verbalizing or are "at risk" can succeed with this approach to learning when they can't in traditional classroom activities. There is little evidence to support such claims, because little research has been reported other than testimonials from teachers and students. Generally, the studies reported are subjective case histories that are likely to be both perceptive and biased. Another problem is that often intact classes are compared over long periods of time. Thus, lack of control of variables limits interpretation and confidence.

Barron (1985, cited in Shutkin, 1990) found that a comprehensive course for fifth-graders, involving both video production and media studies, led to the development of mental skills necessary for understanding television programming. Torrence (1985) reviewed research findings about the features that should be incorporated in school video production experiences. These features are offered through guidelines on message design and utilization factors. Laybourne (1981, cited in Valmont, 1995) states that children who make their own television productions become more critical viewers.

This assertion of an association between video production experience and media literacy is common in the literature, although few report studies that investigated the phenomena. Messaris (1994) addresses "production literacy," meaning competency in the production of images. He conducted a study in 1981 (cited in Messaris, 1994) that compared subjects with various levels of competency in filmmaking, from expert to apprentice to novice. They were shown a film containing both traditional naturalistic style (narrative) editing and experimental editing. All three groups ignored visual conventions in their interpretations of the traditional editing sequences and instead discussed the events in the film as if they actually occurred. With the experimental sequences, however, there were differences among the groups. The novices became confused and struggled to interpret. The apprentices and especially the experts discussed explicit intentions of the filmmaker and the visual conven-

tions used. In a follow-up study (Messaris & Nielsen, 1989), the significance of production experience was confirmed. The researchers interpreted the findings as indications that production experience heightened awareness of manipulative conventions and intent and thus improved media literacy.

Shutkin (1990) has urged the development of a critical media pedagogy, because the adoption of video equipment in the schools is not politically neutral and, therefore, is potentially problematic. In support of his theoretical position, Shutkin offers a review of the research and theory around video production education and filmmaking. He points out that video production involves interpersonal and group process skills that can be researched, as well as other aspects of the communication process that suggest variables for researchers to pursue. Shutkin raises questions such as, "If video production is being used to lower the dropout rate, raise self-esteem, or develop technological skill, why are we not determining whether and how these results occur and what mediates the process?"

11.7.2.3. Educational Series Programming. The most important research on educational programs designed for home and classroom use comes from Children's Television Workshop (CTW). The contribution of this organization to television research is of such overwhelming importance that this section will devote much of its discussion to CTW. In 1990, Keith Mielke, senior research fellow at CTW, edited a special issue of *Educational Technology Research and Theory* devoted to CTW. In a case study of CTW, Polsky (1974) concluded that historical research supports the conclusion that systematic planning was the key to CTW's success.

CTW produced several series that were used in the classroom as well as broadcast to the home. Among these series were *Sesame Street*, which was used in some elementary schools, *Electric Company*, *3-2-1 Contact*, and *Square One*. Research on *Sesame Street* has already been discussed; however, the research on each of the other series will be discussed separately in this section.

11.7.2.4. Electric Company. *Electric Company* was aimed at children in early elementary grades who were deficient in reading skills. It focused on blending consonants, chunking of letter groups, and scanning for patterns. Learning outcomes were supposed to be discrimination of vowels from consonants, scanning text for typical word structures, and reading for meaning by using context. The series was an experiment in using a video medium to teach decoding skills for a print medium.

Stroman (1991) stated that summative evaluations of *Sesame Street* and the *Electric Company* indicated that African-American children improve their cognitive skills after exposure to these programs. Graves (1982) pointed out the importance of adult covieving. Learning increased and reading performance improved after children viewed these programs with an adult present. When teachers made sure chil-

dren viewed, used additional learning materials, and provided practice, children learned these skills, with the greatest gains being made by the youngest children and children in the bottom half of the class. A comparison made with home viewing indicated that it was important to attract the viewers for a sufficient number of shows to have a measurable impact on reading skills. Research on the series suggested the difficulty of depending on the home as the context for learning (Johnson, 1987).

11.7.2.5. 3-2-1 Contact. 3-2-1 Contact was designed to harness the power of television to convey to children the excitement and fascination of science. Its objective was to create a climate for learning about science, in other words to provide science readiness. It was aimed at 8- to 12-year-old children. After 2 years of research, CTW offered some surprising insights about 8- to 12-year-olds and television:

- They attended to stories where a problem was posed and resolved through relations between recurring characters, particularly those dealing with life and death themes.
- They attended primarily to the visual channel. A dense or abstract audio track overwhelmed them.
- They thought in terms of their personal experiences rather than abstractly.
- Boys favored action and adventure programs, while girls favored programs about warm, human relationships.
- They identified with and preferred the cast of members like themselves in terms of gender or ethnicity.
- They preferred role models who were somewhat older,
- They preferred the characters on the show who were competent or striving to be competent.
- They liked humor in sequences only when it was age and subject appropriate.
- They had a traditional image of scientists as middle-aged white males working in laboratories to invent or discover. However, younger scientists were often more impressive to these children than Nobel Prize winners.
- They needed a wrap-up at the end of the program to make connections and reinforce learning.

All of these findings were taken into account when the format and content of the program were determined (Iker, 1983). Research on the program indicated that significant gains occurred in comprehension and in interest and participation in science activities. However, there were no significant effects on career attitudes (Revelle, 1985; Research Communications, 1987, cited in Sammur, 1990). Gotthelf and Peel (1990) reported the steps CTW took to make the program, which was originally designed for home viewing, a more effective science teaching tool when used in school

classrooms. Instructional technologists who read their article will be interested in the barriers that needed to be removed and the resources that needed to be provided. An annotated research bibliography on 3-2-1 Contact is available from CTW (Research Division, CTW, nd.).

11.7.2.6. Square One. This series was introduced in 1987 with the objective of addressing the national need for early positive exposure to mathematics. Its primary audience was intended to be 8- to 12-year-olds viewing at home. The content was to go beyond arithmetic into areas such as geometry, probability, and problem solving. However, the program was designed to be motivational rather than to teach cognitive skills. The program was used in classrooms. Chen, Ellis, and Hoelscher (1988) investigated the effectiveness of reformatted cassettes of the program. Chen et al, mention that previous studies of educational television identify two classes of barriers to school use: technological (i.e., obtaining equipment); and instructional (i.e., finding supplementary materials, designing lessons, and finding time). Teachers found the cassettes especially helpful in demonstrating connections between mathematical ideas and real-world situations. The most researched variable related to this program is problem-solving outcomes. In studies done in the Corpus Christi, Texas, public elementary schools, viewers demonstrated more skill in problem solving than nonviewers. This was generally true in the research done on the effects of Square One (Debold, 1990; Hall, Esty & Fisch, 1990; Peel, Rockwell, Esty & Gonzer, 1987; Research Communications, 1989, cited in Sammur, 1990). In addition, viewers recalled aspects of mathematics presented on the show and displayed more positive attitudes and motivation towards science (Schauble, Peel, Sauerhaft & Kreutzer, 1987, as reported in Sammur, 1990; Debold, 1990). A five-volume report on a National Science Foundation study of the effects of the series reported an interesting finding:

Across all of these themes, there were no substantive differences among the viewers' reactions as a function of their gender or socioeconomic status. The reactions described above came from both boys and girls and from children of different economic backgrounds (Fisch, Hall, Esty, Debold, Miller, Bennett & Solan, 1991, p. 13).

A research history and bibliography on Square One is available from CTW (Fisch, Cohen, McCann & Hoffman, 1993).

11.7.2.7. ThinkAbout. ThinkAbout was a series created by the Agency for Instructional Television in the early 1980s. It consisted of 60 15-minute episodes designed to strengthen reasoning skills and reinforce study skills. There were 13 program clusters on topics such as estimating, finding alternatives, and collecting information. The series was aimed at upper elementary students. Research on ThinkAbout is reported in a series of ERIC documents from the late 1970s and early 1980s (Carrozza & Jochums, 1979; Sanders & Sonnad, 1982).

Students who spent 2 hours a week watching the program improved their thinking skills to a very limited extent. Although the program added a new element to the classroom, research did not support its effectiveness (Sanders, 1983, cited in Johnson, 1987). Johnson also reported that the research itself was flawed in two ways. First, the criterion of effectiveness was performance on the California Test of Basic Skills, which was too general a test to provide a realistic measure of success. Secondly, the research was done after 1 year of uncontrolled use. There was no assurance that teachers had been trained to use the series as intended or that they did. This is documented by a series of case studies on how ThinkA bout was used in classrooms, which reported that the series was both used effectively and misused (Johnson, 1987). Over 80% of the teachers reported that the series presented complex ideas better than they could and that the programs stimulated discussion (Sanders, 1983, cited in Johnson, 1987).

Television series for classroom as well as home use have come from other sources. The British government funded the Open University, which has a library of over 3,000 instructional video programs keyed to courses. The British have also produced many series, such as *The Ascent of Man*, which are suitable for instructional purposes. Several series for secondary and postsecondary education in the United States have been funded by the Annenberg Foundation. Unfortunately, most of these fine series have neither been researched nor used in classroom settings.

11.7.2.8. Subject-Matter Instruction. Secondary teachers in subject-matter areas have used film and video to enhance their teaching. The areas in which they have been used most extensively are social studies and science.

Because television is the main source of news for most Americans, the area of social studies has a mandate to teach critical-viewing skills. In addition, television has become the primary medium for political campaigning in the United States. Thus, educating voters requires attention to television and its effects. Fortunately, there is plentiful research on learning from television news, some of which will be discussed later in this section (Hepburn, 1990). The other area in which research is available to help the social-studies teacher use television is economics. Huskey, Jackstadt, and Goldsmith (1991) conducted a replication study to determine the importance of economics knowledge to understanding the national news. Of the total news program, 13% (or 3 minutes) was devoted to economic stories, but knowledge of economic terms was essential to understand the stories (Huskey, Jackstadt & Goldsmith, 1991).

There are many studies on the effectiveness of using television and film to teach science and mathematics. Two recent interesting approaches need to be researched. One suggests that science fiction films and programming be used to teach science (Dubeck, Moshier & Boss, 1988); another uses teacher-training institutes for science, television, and tech-

nology to impact classroom teaching. This project is called the National Teacher Training Institutes for Science, Television and Technology. Managed by Thirteen/WNET, the New York City public television station, it is an alliance between education, business, and public television (Thirteen/WNET, 1992). The research was supported by Texaco Corporation. By the end of 1993, the Teacher Training Institutes will have reached 17,000 teachers and 2 million students. So far findings have been that students in classes exposed to ITV outperformed peers in non-ITV classes, that they scored higher on creative imagery and writing, that they are more confident in problem solving, and that they learn more in proportion to the time spent on ITV.

11.7.2.9. Satellite Programming. Programming delivered to the classroom via satellite can be divided into two categories: news programs and subject-matter courses. The most famous of the news programs is Channel One, but there are others, such as CNN Newsroom, which is broadcast by Ted Turner's news network (Wood, 1989). The courses are distributed from many sources, the most commonly known of which is the Satellite Educational Resource Consortium (SERC). Very little research has been done on courses distributed by satellite to schools, because this is a relatively recent phenomenon.

Zvacek (1992) compared three classroom news programs: Channel One, CNN Newsroom, and the front-end news segment of Today. Although each show followed a pattern of different segments, there was variability between the programs. She found differences in the proportion of time devoted to news and features, in the content of news stories, in the length of the news stories, in a national or international orientation, and in format. Channel One devoted slightly more time to features than did the other programs. Today spent more time on news than did the other programs. CNN Newsroom had more stories on world events and Channel One on national events. Late-breaking news often did not make it onto the pretaped school news programs. Channel One includes advertisements, while CNN Newsroom does not,

Some research has been done specifically on Channel One. Generally, the findings from different studies are consistent about these points:

- Viewers like the features more than the news.
- Viewers ignore the advertisements.
- Knowledge of current events does not improve significantly.
- The program is not integrated in the school curriculum; teachers do not prepare students for watching or discuss what was watched.
- Knowledge of geography and map reading is increased (Knupfer, 1994; Knupfer & Hayes, 1994; Thompson, Carl & Hill, 1992; Tiene, 1993, 1994).

There are many ethical and social issues associated with the use of Channel One in the schools. These issues arose

because Whittle Communications offered free equipment to each school that would agree to require students to watch the news program for 10 minutes a day for 3 years. In exchange, a school received a satellite dish, two videocassette recorders, a color television set for every classroom, and all necessary internal wiring, installation, and servicing. Over 8 million teenagers in more than 12,000 schools currently view the program and its advertisements. The issues provoked by the acceptance of the program are explored in *Watching Channel One*, a book of research edited by Ann De Vaney (1994). In many ways, the book is an example of a postmodernist approach to research on television effects. As such it is interesting both for the methodologies incorporated and the ideas presented. In the book, John Belland raises questions such as whether it is ethical for educators to deliver a mass audience for advertisers, and whether the time invested is defensible even if used for a discussion of popular culture.

11.7.3 News Programs

Television news programs are essential sources of information for citizens of all countries. Because learning from television news programs is important, especially in a democracy, extensive research on learning from television news programs has been done nationally and internationally. Unfortunately, methodological problems have hampered researchers and limited the usefulness of this body of literature. For example, Robinson and Levy (1986) discredited the methodology of studies, which determined that television is the primary purveyor of news. Their criticism centered on poorly designed survey questions.

This section will address four variables after methodological issues are explained. Two of the variables will be independent variables: news item or story (content) characteristics and presentation variables.* One will be a mediating variable, viewer characteristics, and one will be a dependent variable, learning outcomes.

11.7.3.1. Methodological Issues. The major methodological issue is the confounding of variables. For example, it is difficult to determine to what extent differences in knowledge are affected by exposure to other media or by talking with family and friends. Without controls for other important variables, the independent effects of television news viewing on learning cannot be determined (Gunter, 1987). Another example is the confounding of two independent variables, content and presentation. It is difficult to determine whether effects are due to design or content factors or to an interaction of the two, because a message must incorporate both factors. This confounding is further complicated by additional mediating factors outside of television (Berry, 1983). Research that examines the relationship between dependence on newspapers or television for news and mediating factors, such as viewer characteristics or exposure to a

variety of media, provides another example of the difficulty of controlling for confounding variables (Gunter, 1987).

A second major methodological issue is consistent with definitional issues reported in other sections, such as scholastic achievement and family context. It is difficult to make comparisons across studies, because variables are defined or interpreted differently. This is especially true with the variables of attention, recall, and comprehension. There are at least three distinct levels at which attention to news can be measured: (a) regularity of watching, (b) deliberateness of watching, and (c) degree of attentiveness to the screen (Berry, 1983). Recall can be free,* cued,* or aided, and can vary within each of these categories. Recall is sometimes incorrectly interpreted as comprehension of news stories.

An additional weakness in television news research is the generally narrow interpretation of the data without reference to a theoretical base. Consequently, it is difficult to relate the findings of different studies, and it's especially hard to relate them to what is known about learning in general. One reason for this is that research on television news is often done by those in mass-media areas who do not focus on theories of learning. This issue has been addressed from an information-processing perspective by Woodall, Davis, and Sahin (1983) in an article on news comprehension.

11.7.3.2. Viewer Characteristics. Educational level, gender, intelligence, frequency of watching, interest, motivation, and knowledge of current events have all been found to be significantly related to learning from television news. Of these factors, the most significant seems to be knowledge of current events, because the other factors are only slightly related, or there are conflicting studies. Berry (1983) speculated on whether the importance of knowledge of current events is due to its correlation with education or its role as an indicator of ability to assimilate knowledge and thus retain it.

While there has been considerable interest in the effect of motivation on learning from television news, the evidence is not clear. Several studies claim to show motivational effects; however, there are not many studies that can be compared (Berry, 1983; Gunter, 1987). For example, differences in mean news recall from television bulletins were found to be greater in those with higher motivation than with higher educational level (Neuman, 1976). However, statistical controls for the effects of knowledge might change these results. Nevertheless, the finding that those who watch for information learn more than those who watch for purely entertainment is consistent with other research in education on learning from intentional set (Gantz, 1979, cited in Gunter, 1987).

Research on the effect of frequency of viewing is characterized by the same methodological problems as other research on learning from television news (Gunter, 1987). Cairns has studied comprehension of television news since

1980, using children from the North and South of Ireland and has found an interaction with age. Children aged 11 years who reported greater viewing frequency knew more about current events (Cairns, 1984, cited in Gunter, 1987). In 1990, Cairns reported research on how quantity of television news viewing influenced Northern Irish children's perceptions of local political violence. Based on a correlation between viewing frequency and perceptions that matched social reality, Cairns (1990) concluded that children's frequency of viewing affected comprehension. The findings on gender as they interact with learning from violent segments on television news will be discussed under the next topic, news item characteristics.

11.7.3.3. News Item Characteristics. This variable describes the content of news stories. Much of the research has centered around the effects of violent segments and the interaction of violent content with presentation and viewer variables. An important finding in the literature is that there is an interaction between gender and violence in television news. Visual presentation of violence affected how well females recalled the news. Violence negatively affected females recall of other contiguous, nonviolent news stories, but male subject recall was not affected similarly (Gunter, Furnham & Gietson, 1984; Furnham & Gunter, 1985, cited in Gunter, 1987),

This finding highlights an important aspect of the content of television news, its visuals. The visuals are important because they are selected by the producers and thus influence story interpretation, just as the words and announcer's tone do. Cognitive scientists have argued that imagery has an important role in memory. It is generally concluded that memory for pictures is better than memory for words (Fleming & Levie, 1993). The selection of dramatic visuals, therefore, can enhance or impair memory and comprehension.

Violence in a news story can increase interest. However, violent events can distract from attention and learning even though they heighten impact (Gunter, 1987). This finding is in contrast to findings that violent visuals are often remembered better. Gunter (1980) reported on Neuman's study of recall associated with economic news as compared with news of the war in Vietnam. Recall of the war news was much greater, probably due to the visuals used.

The organization of the message is also an important aspect of a news story. Cognitive frames of reference, known variously as schemata or scripts, which individuals utilize during learning, facilitate memory and comprehension. Thus, the absence of an organization compatible with the learner's schemata can contribute to poor comprehension and recall (Graber, 1984; Collins, 1979, cited in Gunter, 1987). Krendl and Watkins (1983) examined the components of a television narrative schema and the effect of set on learning. They concluded that the process of learning from television becomes a function of both the messages sent and the perceptual set with which the messages are received and interpreted.

The groups with an educational set scored consistently higher than groups given an entertainment set. There were no significant differences between groups in understanding the plot; however, groups with an educational set had better recall and higher-level processing. Thus, the organization of the message seems to interact with motivation for watching.

Lang (1989) has studied the effects of chronological sequencing of news items on information processing. She hypothesized that a chronological organization would facilitate episodic processing and reduce the load on semantic memory, thereby reducing effort and increasing amount of information processed. This hypothesis was supported, in that chronological presentation of events was easier to remember than broadcast structure, which presented what is new followed by causes and consequences of the change.

11.7.3.4. Presentation Variables. Another term for these aspects of television news is formal features. With television news, research has centered around factors such as humor, recapping* and titles, narrator versus voice-over, and still and dynamic visuals (see 26.4.3). Kozma (1986) wrote a review article that examined the implications of the cognitive model of instruction for the design of educational broadcast television. In the article he reviews research related to pacing, cueing, modeling, and transformation that has implications for design of presentation features. By transformation he meant having the learner change knowledge in one form to another form, such as from verbal to visual form. He suggested that designers cue cognitive strategies for older learners and increase salience for younger learners.

Perloff, Wartella, and Becker (1982) and Son, Reese, and Davie (1987) investigated the use of recaps in television news. Both articles reported an increase in retention when the news was recapped. Son et al. (1987) speculated that this was due to time for rehearsal. Snyder (1994) analyzed scripts and stories used in television news and concluded that comprehension can be increased by captioning.

Edwardson, Grooms, and Pringle (1976) compared the effect of a filmed news story with the same story related by an anchorperson without visualization. They found that the filmed news story was remembered no better than the story told by the anchor. Slattery (1990) conducted an experiment to determine whether viewer evaluation of a news story would be influenced by visuals when the verbal information was held constant. Treatment number 1 used visuals both related and relevant to the information presented by the audio channel, i.e., visuals of a landfill when a landfill issue was presented. Treatment number 2 used only related visuals, i.e., a shot of a council meeting where an issue was discussed, instead of a visual of the home or people involved. Treatment number 3 consisted of audio information only; no visuals were used. The hypothesis was supported because the visuals influenced the interpretation of the news. Those in treatment number 1 found the story more interesting, important,

informative, unforgettable, clear, and exciting than those in treatments number 2 or 3.

11.7.3.5. Learning Outcomes. The learning outcomes related to television news that have been investigated are attention, recall and retention, comprehension, and attitude change. Of these, the most researched areas are recall and comprehension. One important finding related to recall is that there are dramatic increases when cued or aided recall* is used (Neuman, 1976, cited in Gunter, 1987). Educational level is related to amount of recall. Stauffer, Frost, and Rybolt (1978, 1980, cited in Gunter, 1987) found that spontaneous recall was highest among educated subjects and lowest among illiterate subjects. It is not surprising that education and social class/occupational status were correlated with comprehension of television news (Trenaman, 1967, cited in Gunter, 1987). One must be careful when findings on recall and comprehension are reported, because sometimes measures of comprehension are actually measures of recall.

11.7.4 The Effects of Advertising

Ellen Notar (1989) argues that television is a curriculum, and as such it is the ultimate example of individualized instruction. She questions why we have left it almost entirely in the hands of the profitmakers and why children are not being taught to question the assumptions presented by advertising. She summarizes the situation:

Recently, I did an analysis of both programming and commercials aimed at children. Unbelievable results! The data were worse than an analysis I did in the late 1970s, Commercials were at least 12 to 14 minutes of each hour, repeated over and over again. The sound levels were higher than the regular programs. The messages were violence solves problems, advertisers 'products will make you happy, and popular, sugar products are selected by the best and the brightest. The graphics, photography, and audio were invariably superior to the programs they surrounded, guaranteed to capture children's attention if program interest waned. Television advertiser's spend over \$800 million a year on commercials directed at children under age 12! The average child watching television 4 hours a day sees more than 50 of these spots daily and about 18,000 per year! (p. 66).

11.7.4.1. Evolution of the Research Base. Concern for the effects of advertising on television has a 30-year history. In 1977, the National Science Foundation (NSF) published a review of the literature on the effects of television advertising. The issues addressed are still controversial today:

1. Children's ability to distinguish television commercials from program material
2. The influence of format and audiovisual techniques on children's perceptions of commercial messages
3. Source effects and self-concept appeals in children's advertising
4. The effects of advertising containing premium offers

5. The effects of violence and unsafe acts in television commercials
6. The impact on children of proprietary medicine advertising
7. The effects on children of television food advertising
8. The effects of volume and repetition of television commercials
9. The impact of television advertising on consumer socialization
10. Television advertising and parent-child relations (National Science Foundation, 1977, p. ii)

The report considered both fantasy violence in commercials and commercials adjacent to violent programs. They concluded that there was relatively little violence in commercials, that the types of violence in commercials were rarely imitable, and that the duration of the violence was too short to suggest instigational effects on viewers. The question of definition arose again in regard to research on television; what should be interpreted as violence in commercials and in programming for children is still being debated.

The principal investigator for this report and some of his coinvestigators (Adler, Lesser, Meringoff, Robertson, Rossiter & Ward, 1980) subsequently published another review of the literature on the effects of television advertising. In 1987, Comstock and Paik recognized the importance of the issue for public-policy formation by reviewing its evolution, the points of contention, and the empirical evidence in a report commissioned by the ERIC Clearinghouse on Information Resources. In 1988, Liebert and Sprafkin reviewed the studies on effects of television violence and advertising on children. The areas they synthesized reflect the continuing issues: children's understanding of commercials, effects of common advertising tactics, concerns about products advertised, and training young consumers. A British review of advertising effects of television (Young, 1990) brought attention to many variables that need to be investigated: for example, the effects of formal features used in advertising. In 1991, Comstock and Paik expanded their ERIC review into a book on *Television and the American Child* that reviewed empirical evidence in five areas related to television advertising: recognition and comprehension, harmfulness, parenting, programming, and program content.

The report of the American Psychological Association task force on television effects included a review of research on advertising around topics such as nutrition and health, advertising content and effects, and cognitive abilities necessary to process advertising (Huston et al., 1992). The members of the task force concluded that although the number of commercials increased due to federal deregulation in the early 1980s, many issues related to advertising were not addressed by the research. Some of these issues are the effects of (a) heavy viewing on materialistic values, (b) interruptions for commercials on attention span, (c) health-related commer-

cial, and (d) individual differences in persuadability. Today, new issues have arisen that need to be investigated, because information is important for shaping public-policy positions. The effects of home shopping channels, infomercials, and Channel One are among these issues.

11.7.4.2. Consistent Findings. Some findings have been consistent over these 30 years of research. The strongest is that the effects of television advertising diminish and change as the child ages. Attention to commercials decreases as children get older (Ward, Levinson & Wackman, 1972). Young children have difficulty distinguishing commercials from programming (Zuckerman, Ziegler & Stevenson, 1978), although this ability increases throughout the preschool years. Eventually by age 8, most viewers can make this distinction (Levin, Petros & Petrella, 1982). Kunkel (1988) found that children ages 4 to 8 were less likely to discriminate commercials from regular programming when a host-selling format was used, and that older children were more favorably influenced by commercials in this format. Television commercials influence children's food selections (Gorn & Goldberg, 1982), but the degree of influence is disputed (Bolton, 1983). The combined information seems to indicate that television commercials do have an effect on product selection that is limited when all aspects of a child's environment are taken into account. Nevertheless, young children may be affected greatly by television advertising and need help dealing with it. -

Another finding of consistent importance over the years is the interrelationship of formal features and the effects of advertising. As early as the 1977 NSF report, there was speculation on this relationship. The report stated that the type of violence in children's commercials and programming almost always fell in the fantasy category. Thus, the impact of violence might vary according to the number of fantasy cues. Cartoons have at least three cues to indicate violence (animation, humor, and a remote setting); makebelieve violence generally has two cues (humor and a remote setting); and realistically acted violence generally has only one cue (the viewer's knowledge that the portrayal is fictional). Real-life violence (i.e., news footage) has no cues to suggest fantasy. It is easy to imagine a young child without media literacy becoming confused and misunderstanding such messages.

11.7.4.3. Important Findings. An important study, "A Longitudinal Analysis of Television Advertising Effects on Adolescents," was conducted by Moore and Moschis and reported in 1982. This study is mentioned because the effects of television advertising on a society of widely differing economic groups is another area that needs researching. Moore and Moschis concluded:

In addressing the question of whether television advertising has a direct effect or is mediated through interpersonal processes, it was found that the family communication environment may perform such a mediating function. Specifically, television advertising appears to have

some effects on the development of materialism* and traditional sex roles among those families which are not likely to discuss consumption matters with their children, apparently placing the child at the mercy of advertising, a finding consistent with previous research (Churchill & Moschis, 1979, p. 3).

Another important study was done by Jalongo in 1983. She investigated "The Preschool Child's Comprehension of Television Commercial Disclaimers."* She used "The Personal Interview Questionnaire" (Blatt et al., 1971; Ward, 1972), which assessed general knowledge about television. Results indicated that linguistic ability was a poor predictor of paraphrase and standard/modified disclaimer scores. Scores reflecting general knowledge about television were the most effective predictors of disclaimer comprehension.

11.7.5 Utilization Studies

Research that investigates the use of instructional television, including factors such as (a) availability of equipment, programming, support personnel, and training; (b) attitudes towards television in the classroom and informally; and (c) the impact of instructional television, is grouped in a category called "utilization studies." There is a long tradition of utilization studies which dates back to the early 1950s when the FCC reserved channels for education and to film studies done earlier. Nevertheless, there are many gaps in this area of the literature. In a comprehensive review of ETV as a tool for science education, Chen (1994b) outlines the lack of research, especially developmental research, on the many science series broadcast nationally. Compared to the investment in production, minimal resources have been devoted to research on learning from most of these series.

The category "utilization studies" encompasses research on using television processes and resources for learning (Seels & Richey, 1994). This discussion of utilization research will cover several topics:

1. Variables investigated
2. Projects of historical interest
3. Studies from the Agency for Instructional Technology (AIT), formerly the Agency for Instructional Television
4. Studies from the Corporation for Public Broadcasting (CPB)
5. Other utilization studies

11.7.5.1. Variables Investigated. Chu and Schramm (1968) reviewed research on television before the ERIC Clearinghouse began to compile and organize the literature on learning from television. They summarized the variables that interacted with learning from instructional television. Today, many of these variables are being investigated under questions related to message design. The remaining variables are still pursued in the area of utilization studies. As identified by Chu and Schramm, these variables are:

- Viewing conditions, e.g., angle, context, grouping, interaction (see Chapter 36.)
- Attitudes towards ITV, e.g., students, teachers
- Learning in developing regions, e.g., visual literacy, resistance
- Educational level, e.g., elementary, adult
- Subject matter, e.g., health education, current events
- Relationship to other media, e.g., effectiveness, cost, integration.

Over the years, two of Chu and Schramm's variables have assumed increasing importance: the variable of effectiveness of instruction as measured by formative and summative evaluation, and the variable of impact on the individual, organization, and society.

11.7.5.2. **Projects of Historical Interest.** A good overview of the television utilization studies done in the 1950s, 60s, and 70s is obtained when projects in the Midwest, Hagerstown (Maryland), Samoa, and El Salvador are examined. Most of these projects received funding through Ford Foundation grants, local funds, and corporate equipment. Three districtwide patterns emerged. Studies revolved around investigation of the effectiveness of these patterns, which were (a) total instructional program presented by television teacher, (b) supplemented television instruction, and (c) television as a teaching aid. Total instruction meant that all curriculum was presented through television and the teacher acted as supervisor. With supplemented instruction, the teacher prepared the class and followed up after the program. Only part of the curriculum was presented through television. When television was used as a teaching aid, the classroom teacher just incorporated television into lessons, and use of television was more infrequent (Cuban, 1986).

The Hagerstown, Maryland, project was an early demonstration of supplemented television. Up to one-third of the school day was devoted to televised lessons, with teacher preparation and follow-up. From 1956 to 1961, the Fund for the Advancement of Education and corporations invested about \$1.5 million in improving education in the Hagerstown schools through closed-circuit broadcasting. The initial experiment was a success, because costs were reduced while standardized test scores improved.

By the end of the experiment, over 70 production staff, including 25 studio teachers, telecast lessons in 8 different subjects at the elementary level and 15 subjects at the secondary level. All teachers were involved in the planning, because a team approach was used. Assessment of programs was continuous. Elementary students spent about 12% of their time with televised programs, the junior high students about 30% of their time, and high school students about 10% of their time. Fewer teachers were hired; however, master

teachers were hired to teach televised classes. Student improvement was most dramatic when students who learned by television were compared with those in rural schools who did not receive televised lessons. Although standardized test scores were used to compare groups, there was no control for socioeconomic background. Still, when surveyed, parents, teachers, and administrators favored use of televised instruction.

Unfortunately, when funding was withdrawn after 5 years, problems began to arise because local resources were insufficient, especially for capital expenditures. This is a common pattern in utilization of instructional television. By 1983, the project had been reduced to a service department for the district, using a variety of technologies. The annual budget of \$334,000 was justified, because all art and music lessons were offered through television, thus saving the cost of 12 itinerant teachers, a practice that would certainly be debated by aesthetic educators. Despite this and other exemplary supplemental television instruction projects, most schools used television simply as a teaching aid during this period (Cuban, 1986).

The Midwest Program of Airborne Instructional Television Instruction (MPATI) began in 1959 and continued in conjunction with the Purdue Research Foundation at Purdue University. Thirty-four courses were televised to 2,000 schools and 40,000 students through 15 educational television stations in 6 states. In addition, to reach schools not served by these stations, MPATI transmitted programs from an airplane circling at 23,000 feet over North-Central Indiana. Broadcasting began in 1961, with a cost of about \$8 to 10 million annually (Seattler, 1968).

In contrast, television provided the total instructional program in American Samoa between 1964 and 1970. This approach was justified because the existing teaching staff and facilities were totally inadequate in 1961 when Governor H. Rex Lee was appointed. When Lee made restructure of the school system his top priority, Congress approved over \$1 million in aid for the project. Soon four of every five students were spending one-quarter to one-third of their time watching televised lessons, especially in the elementary schools. The rest of the day was built around preparing for the televised lessons. The packets of material that accompanied the programs became the textbooks.

Researchers examined test scores before and after the introduction of television and found little difference in language scores, although slight advantages in reading and arithmetic were documented. There was little control for mediating variables. The English-speaking ability of the classroom teachers was generally poor, while English was the native language of television teachers. It is interesting, therefore, that the greatest advantage was found in the area of mathematics, not English language (Wells, 1976).

The project was initially reported a success, but by the early 1970s, objections to orienting the whole curriculum to televised lessons increased among students, teachers, and administrators, especially at grades 5 and above. By the eighth year of the project, students wanted less television, and teachers wanted more control over lessons. In 1973, policymakers shifted authority from the television studio to the classroom teacher and cut back the amount of television. In 1979, a utilization study conducted by Wilbur Schramm and his colleagues concluded that television's role had been reduced to supplemental or enrichment instruction, or at the high school level to little more than a teaching aid (Cuban, 1986).

In El Salvador, a major restructuring of education included the use of television to increase enrollment without a loss of quality. Overall educational reforms included (a) reorganization of the Ministry of Education, (b) teacher retraining, (c) curriculum revision, (d) development of new study materials, (d) development of more diverse technical program, (e) construction of new classrooms, (f) elimination of tuition, (g) use of double sessions and reduced hours to teach more students, (h) development of a new evaluation system, and (i) installation of a national television systems for grades 7 through 9. An evaluation project showed no advantage for the instructional television system. The only advantage was in the seventh grade. However, in the eighth and ninth grades, the nontelevised classrooms often obtained better scores. Positive scores during the first year of the reform were dismissed as due to the "halo effect," because scores diminished as novelty of the delivery method diminished (Wells, 1976). As with the Hagerstown project, however, an advantage was found for rural students (Hornik, Ingle, Mayo, McAnany & Schramm, 1973). Thus, "the consistent advantage of television seems to be in improving the test scores of rural students. One of the reasons for this improvement is that the technology provides for the distribution of the scarce resource of high-quality teaching ability" (Wells, 1976, p. 93).

Each of these projects generated related research and guidelines for practice. As television personnel learned about utilization, they shared their experience through handbooks for teachers on how to use television for instruction (Hillard & Head, 1976). Studies of process and impact were done. For example, Nugent (1977) reported a Nebraska State Department of Education field experiment that addressed whether teacher activities increased learning from television. She concluded that telelessons impacted learning, achievement in television classes was higher, and the nature of activities used had an affect on achievement but not the number of activities.

Tiffin (1978) used a multiple case study approach to analyze "Problems in Instructional Television in Latin America." After doing case studies on 8 of the 14 ITV systems in Latin America, critical subsystems were analyzed, especially in regard to conditions that were symptomatic of problems.

Thus, problems and causes were traced until root causes were revealed. In many instances, these turned out to originate outside the ITV system. A hierarchy of casually interrelated problems, called a problem structure, was generated. Problems of utilization subsystems were analyzed. "In four cases the visual component of television was not being used and did not appear to be needed. If the television receiver were replaced by radio it appears unlikely that the measured learning outcomes would be appreciably effected" (Tiffin, 1978, p. 202).

Another project of historical significance is the research done by Educational Facilities Laboratories around the best use of space for the utilization of television. A nonprofit corporation established by the Ford Foundation, Educational Facilities Laboratories (EFL), encouraged research, experimentation, and dissemination about educational facilities. In their 1960 publication on "Design for ETV: Planning for Schools with Television," EFL recommended effective designs for seeing, hearing, and learning, and for group spaces. The issues of cost, equipment, and support were also discussed (Chapman, 1960).

11.7.5.3. Agency for Instructional Technology Studies. AIT is a nonprofit U.S.-Canadian organization established in 1962 to strengthen education. AIT, which is located in Bloomington, Indiana, provides leadership and services through development, acquisition, and distribution of technology-based instructional materials. Although AIT's research program currently centers primarily around formative evaluation of materials, the organization has sponsored utilization studies. A few representative ones will be mentioned here. Dignam (1977) researched problems associated with the use of television in secondary schools, including equipment, scheduling, availability of programs, and teacher resistance. She reported a continuing debate about the extent to which teacher training should be emphasized in relation to systematic evaluation of utilization. Her report, which is based on a review of the literature, concluded that the relaxation of off-air taping regulations granted by some distributors eased scheduling and equipment difficulty, as did videocassette and videodiscs.

It Figures is a series of 28 15-minute video programs in mathematics designed for grade 4, in use since 1982. AIT (1984) did a survey of 117 teacher-users of this series. This survey gathered information on (a) teacher's backgrounds, (b) how teachers discovered and used the series, (c) perceived cognitive and attitudinal effects of the series, (d) teachers' reactions to the teacher's guide, and (e) overall reactions to the series. Seventy-six teachers responded that they perceived the series positively and used it in diverse ways. This is an example of an impact study.

AIT used a series of minicase studies to report on "Video at Work in American Schools" (Carlisle, 1987). This report takes the form of a compilation of experiences the author, Robert Carlisle, had during his travels through 12 states, vis-

iting applications of ITV. He talked to almost 160 people about television utilization and documented them and their projects through photographs. Carlisle concluded that access to equipment is no longer a sizable problem, nor is availability of programming, and the VCR has proved to be a very flexible tool for instruction. Nevertheless, the strength of the human support network behind the teacher was questionable.

1.7.5.4. Corporation for Public Broadcasting Studies. Peter Dirr, director of the Catholic Telecommunications Network, did the first school use television studies for the Corporation for Public Broadcasting. Dirr and Petrone (1978) conducted a study in 1976—1977 that documented the pattern of greatest use of ITV in lower grades and diminishing use in higher grades. They used a stratified sample of 3,700 classroom teachers. This was the first in-depth and rigorously conducted study of public school use since the introduction of television in schools (Cuban, 1986). Estimating based on data collected, they speculated that over 15 million students watched televised lessons daily. As is typical with most subsequent utilization studies, they investigated teacher attitudes, accessibility of equipment, and patterns of use in schools.

CPB sponsored two subsequent school utilization studies, one covering 1982—83 and another covering 1990—91. The research was conducted by CPB and the National Center for Education Statistics (NCES). The final report of the 1982—83 study compared the use of instructional television in 1977 and 1983 (Riccobono, 1985). This 1982—83 study surveyed the availability, use, and support (financial, personnel, and staff development) of instructional media in public and private elementary and secondary schools.

While the 1977 survey focused on television, this study was expanded by adding audio/radio and computers. Queries about instructional applications and equipment were directed to 619 superintendents, 1,350 principals, and 2,700 teachers. Responses were grouped by district size, wealth, and school level. The results indicated that although media use varied across districts and levels, almost all teachers had access to audio, video, and digital media. Over 90% of the districts offered in-service teacher training in media. The status of television for instruction remained relatively stable since 1977, except that fewer elementary teachers and more secondary teachers reported using television (CBP & NCES, 1984).

CPB sponsored the “1991 Study of School Uses of Television and Video,” which surveyed almost 6,000 educators (CPB, n.d.). The results can be generalized to virtually all of the nation’s public education system: 11,218 school districts, 72,291 public elementary and secondary schools, and 2,282,773 school teachers. The survey measured the use of instructional television and video, the availability of equipment and programming, and the support and resources devoted to instructional television. It replaced the audio/radio

and computer component of the 1982—83 report with questions related to several new television-based technologies. The results of the survey show that instructional television is a firmly established teaching tool that is positively regarded by classroom teachers and increasingly well supported with equipment and programming. Programming availability was reported to be one source of frustration for teachers.

11.7.5.5. Other Utilization Studies. The major methodologies used for utilization studies have been experimentation and questionnaire survey. An example of an experimental design would be a study designed to investigate the relative effectiveness of three methods of instruction: conventional classroom instruction, televised instruction only, and a combination of classroom and televised instruction for teaching science content and vocabulary. A 1971 study done in the Santa Ana Unified School District reported no significant difference obtained by either classroom or televised instruction alone. The combination of televised and classroom instruction resulted in the greatest achievement (Santa Ana Unified School District, 1971). Such comparative studies have fallen into disfavor because they cannot be related to individual differences or mediating variables.

An example of a questionnaire approach is Turner and Simpson’s (1982) study of the factors affecting the utilization of educational television in schools in Alabama. The researchers gathered information pertaining to five variables: (a) the percentage of students using ITV, (b) the ratio of students to videotape recorders, (c) ratio of students to television receivers, (d) ratio of students to color television receivers, and (e) students within districts using television. Scheduling was found to be the most important variable. This finding holds true in some cases today. Many districts that contracted for satellite telecourses when they were first offered were surprised to learn that some of the programs required one and a half of their regular periods and that students scheduled for such classes were therefore unable to take some regular classes.

Utilization studies (see 37.4) in the United States have focused on the availability of resources, attitudes towards ITV and ETV, and impact of programming. In comparison, utilization studies of television in developing countries have looked at resource issues from the perspective of the design and support of both educational and television systems.

1.7.6 Summary and Recommendations

Although a great deal of research has been done on programming for preschoolers and classrooms, there are major gaps in the literature. One such gap is in the effects of video production by students. Another area in which the research is confusing is that of newer programming genres for which it is difficult to compare findings. Contemporary varieties of advertising on television also present a very complex topic that warrants more research. Greater attention should be paid to the effects of genre differences and program formats, as

well. It is important for researchers to investigate the interaction of the content and form of programming with other variables.

Many areas identified by research have not been adequately pursued, such as the effect of programs and utilization practices on rural children. Barriers to greater utilization are teachers' lack of knowledge about sources of programming for their subject-matter area and research on utilization. Utilization may be facilitated through "Cable in the Classroom," a nonprofit service of the cable television industry, which will offer educational programming for the classroom, curriculum-based support materials, and a clearinghouse for information on cable use in schools. Over 500 hours of high-quality programs will be delivered to schools each month, without commercial interruption (Kamil, 1992). Opportunities for research will arise as a result. KIDSNETT, a computerized clearinghouse concerned with programs for children preschool through high school, will be another source of information for researchers. Its "Active Database" has detailed information on 5,000 children's programs and public-service announcements and on 20,000 programs available for use in classrooms (Mielke, 1988).

11.8 CRITICAL-VIEWING SKILLS

To some extent, the critical-viewing skills movement was motivated by the gradual deregulation of the broadcasting industry. During the mid-1980s, as research turned more to the study of the interaction of variables, it became apparent that parents and teachers could have an important mediating role to play (Palmer, 1987; Sprafkin, Gadow & Abelman, 1992). This discussion of the critical-viewing skills movement will address (a) its relationship to the media literacy movement, (b) the assumptions underlying critical-viewing skills, (c) the goals adopted by the movement (see 16.6.2.2), (d) the curriculum projects developed to attain these goals, (e) the research findings on these projects, and (f) the impact of these projects. In an article on developmentally appropriate television, Levin and Carlsson-Paige (1994) suggested, "Now, the children who first fell prey to deregulated children's TV in 1984 are entering middle and high school; among them we see an alarming increase in violence" (p. 42). This inference is not easily supported in the literature, however, because there are other factors interacting with the effects of television. Nevertheless, violence has increased in society and on television. The authors point out that a content analysis of television programming reveals a:

- Dangerous, rather than secure world
- World where autonomy means fighting, and connectedness means helplessness, rather than a world of independent people helping each other
- World where physical strength and violence equal power, rather than a world where people have a positive effect without violence

- World with rigid gender divisions, rather than complex characters
- World where diversity is dangerous and dehumanizing and stereotyping abounds, rather than a world of respect where people enrich each others lives
- World where people are irresponsible and immoral, rather than a world where empathy and kindness pervade
- World full of imitative play, rather than creative, meaningful play

Based on this review and what is on television, it could be argued that this perception is biased towards negative effects. Nevertheless, there are plenty of instances of negative content to support this framework. Arguments about content on television and the role of mediation have stimulated efforts to emphasize media literacy.

11.8.1 Media Literacy

The media literacy debate encompasses issues around the role of content in relation to format and media literacy. It can be argued that today the medium dominates "symbol production and myth/reality dissemination in contemporary society" (Brown, 1991, p. 18). Others argue that to divorce content from examination of variables is illogical and selfdefeating (K. W. Mielke, personal communication, Nov. 15, 1994). Another point of view is that television is decoded by a viewer drawing on a unique social and cognitive background, and thus the effects of television depend more on the receiver than on content or media literacy. The argument as to whether content should be controlled or taken into account in research is set in opposition to the development of media literacy, when probably both perspectives are important (Brown, 1991).

Worth raises another concern that reinforces the argument for attention to both content and media literacy.

Throughout the world, the air is being filled with reruns of "Bonanza" and ads for toothpaste, mouthwash, and vaginal deodorants. . . . If left unchecked, Bantuy, Dani, and Vietnamese children, as well as our own, will be taught to consume culture and learning through thousands of "Sesame Streets," taught not that learning is a creative process in which they participate, but rather that learning is a consumer product like commercials.

If left unchecked, we, and perhaps other nations like us, will continue to sell the technology which produces visual symbolic forms, while at the same time teaching other peoples our uses only, our conceptions, our codes, our mythic and narrative forms. We will, with technology, enforce our notions of what is, what is important, and what is right (Worth, 1981, p. 99, cited in Brown, 1991, p. 21).

A concern for receivership skills* developed from the perception that television was being used as a consumer product. Receivership skills "involve comprehending overt and

hidden meanings of messages by analyzing language and visual and aural images, to understand the intended audiences and the intent of the message” (Brown, 1991, p. 70). Thus, an attempt is made to extend the tradition of teaching critical reading and critical thinking to include critical viewing.

Concern for media literacy is not new. When films were a prevalent audiovisual medium, there were many publications about the need for film literacy (Peters, 1961). A 1970 article by Joan and Louis Foresdale proposed film education to help students develop levels of comprehension and learn filmic code. As mentioned earlier under the topic filmic code, Salomon (1982) redirected attention to television literacy. * He theorized that comprehension occurred in two stages, both employing cognitive strategies for decoding and recoding. The first stage was specific television literacy dependent on knowing the symbol system associated with television viewing (see 16.4.2.1). The second stage required using general literacy skills to move to higher levels of learning. He also theorized that, except for small children, the general literacy skills were more important. He based his theory of a television symbol system on research conducted by himself and others (Salomon, 1982).

By the 1990s, books were available on television literacy (Neuman, 1991). Some of these came from the visual literacy movement, such as Messaris’s *Visual “Literacy”: Image, Mind, and Reality* (1994). In this book, he synthesizes research and practice in order to identify four aspects:

- Visual literacy is a prerequisite for comprehension of visual media.
- There are general cognitive consequences of visual literacy.
- Viewers must be made more aware of visual manipulation.
- Visual literacy is essential for aesthetic appreciation.

In responding to Clark’s argument (1983, 1994) that media research tells us little, Kozma (1994) has brought attention to the centrality of media literacy for instructional technology research. Kozma argues that we need to consider the capabilities of media and their delivery methods as they interact with the cognitive and social processes by which knowledge is constructed. “From an interactionist perspective, learning with media can be thought of as a complementary process within which representations are constructed and procedures performed, sometimes by the learner and sometimes by the medium” (Kozma, 1994, p. 11). Thus, Kozma extends the attention directed to the interaction of media and mediating variables that began in the 1980s.

11.8.2 Critical-Viewing Education

During the 1980s, critical-viewing curricula were developed based on a number of underlying assumptions. These assumptions will be discussed next.

11.8.2.1. Assumptions about Critical Viewing. A significant assumption used in developing curricula on critical viewing was drawn from the analogy between positive television-viewing patterns and a balanced menu or diet. In fact, the terms “good TV diets” (O’Byrant & Corder-Bolz, 1978), “media diets” (Williams, 1986), “television diets” (Murray, 1980), and “balanced diet” (Searching for Alternatives, 1980) appeared frequently in the literature on television viewing. The assumption was that if television was watched in moderation and a variety of age-appropriate program genres were selected, the television experience would be positive. The only evidence we have found to support this assumption is the finding that moderate amounts of watching can increase school achievement. Other than indications that young children can become fearful or confused from watching adult programming, little evidence exists to support the need to view diverse and appropriate types of programs. Such research has not been done. It may be that individual or family differences justify an “unbalanced TV diet.”

A second unstated assumption was that a critical viewer,* like a critical reader, would have the critical-thinking skills of an adult. But “the efficacy of children imitating adult reasoning remains untested” (Anderson, 1983, p. 320). Children, especially young children, process information concretely and creatively. Therefore, they may not benefit from more logical analyses. The critical viewer may be less like a critical reader and more like an art critic.

Another assumption was that the critical-viewing process had to have as its primary purpose education rather than entertainment. Consequently, viewers had to become more knowledgeable, and the best way to do this was through classroom curricula (Anderson, 1983). Critical-viewing curriculum projects had to meet the criteria of systematic instruction and the provision of a variety of audiovisual materials. For years, some anthropologists have argued that much visual literacy is learned naturally from the environment. Presumably, critical viewing could be learned in the home environment without instructional materials.

Primarily, the tests of these three assumptions were formative evaluations of the success of the educational interventions conducted in the name of critical-viewing skills curricula. While these efforts were found to improve learning, there was little other evidence to use. Nevertheless, positive reports from parents, teachers, experts, and students were given credence. On the other hand, the positive effects could be the result of maturation (Watkins, Sprafkin, Gadow & Sadetsky, 1988). Anderson (1980) has traced the theoretical lineage of critical-viewing curricula.

11.8.2.2. Goals for Critical-Viewing Curricula. Amy Dorr Leifer (1976) conducted a comparative study to iden-

tify critical evaluative skills associated with television viewing. Five skills were tentatively proposed:

1. Explicit and spontaneous reasoning
2. Readiness to compare television content to outside sources of information
3. Readiness to refer to industry knowledge in reasoning about television content
4. Tendency to find television content more fabricated or inaccurate
5. Less-positive evaluation of television content (Dorr, 1976, p. 14)

At the end of the 1970s, the U.S. Office of Education (USOE) sponsored a national project, Development of Critical Television Viewing Skills in Students, which was intended to help students become more active and discriminating viewers. Separate curricula were developed for elementary, middle-school, secondary-, and postsecondary-age students. Four critical television skills emphasized in the secondary curriculum were the ability to:

- Evaluate and manage one's own television-viewing behavior
- Question the reality of television programs
- Recognize the arguments employed on television and to counterargue
- Recognize the effects of television on one's own life (Lieberman, 1980; Wheeler, 1979)

In 1983 Anderson identified 11 objectives in 8 curriculum projects. He interpreted these as reflecting four goals common to all the projects. The goals were: (a) ability to grasp the meaning of the message; (b) ability to observe details, their sequence and relationships, and understand themes, values, motivating elements, plot lines, characters, and characterization; (c) ability to evaluate fact, opinion, logical and affective appeals, and separate fantasy and reality; and (d) the ability to apply receivership skills to understand inherent sources of bias (cited in Brown, 1991). The goals and objectives of the major critical-viewing skills projects are summarized by Brown (1991).

A common approach to attaining these goals was to include content on the various programming genre. Participants would be taught to distinguish types of programming and to use different analysis approaches with each. Brown (1991) reviews the various approaches to defining genre, such as types, classifications, and typology. Bryant and Zillmann (1991) dedicate Part II of their book of readings on Responding to the Screen to an in-depth analysis of research and theory on each genre and associated literacy issues including news

and public affairs, comedy, suspense and mystery, horror, erotica, sports, and music television.

11.8.2.3. Critical-Viewing Skills Curricula. Over the years, there have been many curricula to develop television literacy, in addition to the USOE project curricula described above. In the United States, these curricula were developed by local television stations, national networks underwriting social research, school districts, research centers, and national coalitions. Most of these have been summarized by Brown in his book on major media literacy projects (1991). Some have been developed by companies (i.e., J. C. Penny's), some by researchers [i.e., the Critical Viewing Curriculum (KIDVID) and the Curriculum for Enhancing Social Skills Through Media Awareness (CESSMA)], some by practitioners (i.e., O'Reilly & Splaine, 1987), and some by nonprofit associations (i.e., Carnegie Corporation) or coalitions, such as Action for Children's Television. A few will be described here, especially those that have been summatively researched or that address unique populations or content.

The recommendations of Action for Children's Television (ACT) are summarized in *Changing Channels: Living (Sensibly) with Television* (Charren & Sandler, 1983). This is an example of an educational plan intended for general use rather than specifically for the classroom. A more current example of general recommendations is Chen's (1994a) *The Smart Parent's Guide to KIDS' TV*

The Curriculum for Enhancing Social Skills Through Media Awareness (CESSMA) was designed to be used with educationally disabled and learning-disabled children to improve their prosocial learning from television. CESSMA was field tested in an elementary school for educationally disabled children on Long Island. The curriculum group significantly outperformed the control group on television knowledge. Children in the intervention group identified less with aggressive television characters than those in the control group. Nevertheless, there was no evidence that CESSMA significantly altered attitudes or behavior.

KIDVID has been used with gifted and learning-disabled children. It was designed to facilitate children's ability to recognize the prosocial content from a television program. The 3-week curriculum, originally developed for intellectually average and gifted children, was tested in intact fourth-grade classrooms using indices to measure the children's ability to identify and label the types of prosocial behaviors portrayed in commercial television programs. The curriculum was effective because all who participated were better able to recognize and label prosocial behaviors (Sprafkin, Gadow & Abelman, 1992).

Previously, in 1983, Abelman and Courtright had conducted a study on television literacy in the area of prosocial learning. In that study they found evidence that curriculum can be effective in amplifying the cognitive effects of commercial television's prosocial fare. They concluded:

For children who rely on television information as an accurate source of social information, who spend the majority of their free time with the medium, and who are unable to separate television fantasy from reality, some form of mediation is imperative (p. 56).

A practitioner's approach to a curricula on television literacy for gifted learners was reported by Hunter (1992). This approach used video production to teach fifth- through eighth-graders. Students were divided into three treatment groups. One of the two critical-viewing treatment groups showed significant gains, while the control/no treatment group did not.

Another practitioner approach was reported by Luker and Johnston (1989). Teachers were advised to help adolescent social development by using television shows in the classroom with a four-step process:

There are four steps to take after viewing a show: (1) Establish the facts of the conflict, (2) establish the perspectives of the central characters, (3) classify the coping style used by the main character, and (4) explore alternatives that the main character could take and the consequences of each alternative both for the main character and the foil (p. 51).

They found that teachers were effective in completing the first two steps, but had greater difficulty with steps 3 and 4.

The effect of learning about television commercials was studied in an experiment by Donohue, Henke, and Meyer (1983). Two instructional units, one role-playing unit and one traditional, were designed to examine if young children can be taught general and specific intent of television commercials. Both treatment groups of 6- to 7-year-olds experienced significant increases in comprehension of commercials. The researchers concluded that:

Through mediation via an instructional unit at the 7-year mark, the process of building defense mechanisms against the manipulative intent of countless television commercials can be considerably accelerated to the point where children are able to effectively and correctly assimilate commercial messages into their developing cognitive structures (p. 260).

Rapaczynski, Singer, and Singer (1980) looked at children in kindergarten through second grade. They introduced a curriculum designed to teach how television works, which was produced by simplifying the content of a curriculum intended for older children. Although a control group was not used, this curriculum intervention did appear to produce substantial knowledge gains. Another curriculum developed for kindergarteners and second-graders also was found to produce significant knowledge gains (Watkins, Sprafkin & Gadow, 1988). In this case, the study used another class at each grade level as nontreatment controls.

Currently, the Academy of Television Arts and Sciences is mounting a critical-viewing skills campaign. Its members

offer free workshops using a videotape and exercises developed by Dorothy and Jerome Singer under the auspices of the Pacific Mountain Network in Denver.

11.8.2.4. Evaluation of the Curricula. The major thrust in critical-viewing skills came with the four curriculum development projects sponsored by the U.S. Office of Education at the end of the 1970s. Each project addressed a different age group. A final report on the development of the curriculum for teenagers was prepared by Lieberman (1980). The formative evaluation of the curriculum, which is reported in a series of Educational Resource and Information Clearinghouse (ERIC) documents, was done by the Educational Testing Service.

To evaluate the curriculum for teenagers, Educational Testing Service identified 35 reviewers representing various constituencies (Wheeler, 1979). Generally, the review revealed effective use of an instructional systems design and development process.

Based on his review of the literature, Brown (1991) presents 20 descriptive criteria for assessing critical-viewing skills curricula or projects. The criteria fall into these categories:

- Breadth: meaning social, political, aesthetic, and ethical perspectives
- Scope: meaning adaptability and wide utilization
- Individuality and values: meaning reflecting diverse heritages and sensitization of viewers to their role
- Validity and reliability (accuracy): meaning based on research
- Cognition (developmental): meaning age-appropriate education
- Cognition (reasoning skills): meaning training in analysis and synthesis
- Pragmatics of media education: meaning incorporating the content and form of media literacy projects.

11.8.2.5. Impact of Critical-Viewing Projects. How effective have these curricula been across the country and over the years? Berger (1982) suggested that it would take 30 years before the results would be known. Bell (1984), however, concluded that several indicators pointed to the rapid demise of curricula on critical television viewing. Although he found little evidence that the curriculum materials produced under the aegis of the USQE had been assimilated into school curricula, he noted that the skills promoted have not been completely forgotten by instructional technologists. The impact of content and strategy was greater than the influence of the movement or subsequent use of the materials, many of which are no longer available. Bell also reported another troublesome indicator. The Boston University Critical Television Viewing Skills Project for adults, directed by the highly regarded Donis Dondis, dean of the School of Communication, was given the Golden Fleece

award by Senator William Proxmire. This was his monthly prize for ridiculous and wasteful government spending. The lack of clear understanding of the need for such projects and their potential was clear in the statement he read in 1978:

If education has failed to endow college students with critical facilities that can be applied to the spectrum of their lives, a series of new courses on how to watch television critically will not provide it (cited in Bell, 1984, p. 12).

11.8.2.6 Summary and Recommendations From formative and summative evaluation and a few experimental studies, there is evidence that intervening with instruction on critical viewing increases knowledge of and sophistication about television. Ableman and Courtright (1983) summarize the situation well: “. . . television literacy curricula can be as much a social force as the medium itself” (p. 56).

The need for field research on the effects of interventions is documented by the paucity of literature on applying the findings of research through interventions. We know that children learn more from any form of television if adults intervene. The various ways of intervening need to be researched using methods other than formative evaluation. Systematic programs of intervention need to be developed and their impact measured.

11.9 CONCLUDING REMARKS

This chapter has dealt only with research on traditional forms of television (see 4.4.4.2) and instructional film. The research on newer technologies, such as interactive multimedia, has been left for others to review. Nevertheless, based on the literature surveyed, it would not be surprising to find that 20,000 research articles have already been published on learning from film and television. We have endeavored to identify the important variables that have surfaced from this mass of research. It was not possible to narrow this list of variables to any great extent, because most were relevant either to the design, development, or utilization functions of this field. Nor could we narrow the list by concentrating on research about film and television solely in the classroom, because instructional technology as a field has a responsibility to media literacy and learning in many environments. The review was not limited to research done within the field because, in this case, many disciplines contribute information useful to the practitioners and researchers in our field. Therefore, the chapter has traced the progress of research in many fields over decades and summarized the important variables related to areas of interest to our field. These areas are message design, mental processing, school achievement, family context for viewing, socialization, programming, utilization, and critical-viewing skills. Research in these areas has investigated independent variables, mediating variables, and effects. This chapter concludes with consideration of myths about learning from television in the light of this review.

Milton Chen (1994c), director for the Center for Education and Lifelong Learning at KQED in San Francisco, summarizes many myths about the effects of television. He argues that to conclude that television is primarily responsible for “turning kids into couch potatoes, frying their brains, shortening their attention spans, and lowering their academic abilities” is too simplistic. Indeed, there are several suppositions about the effects of television that seem mystifying in light of the research reviewed in this chapter.

The first myth is that television encourages mental and physical passivity. Research reveals that a great deal of mental activity takes place while viewing, some in reaction to programming and the rest in reaction to elements in the environment. In his essay on whether television stimulates or stultifies children, psychologist Howard Gardner (1982) argues that there is little if any support for the view that the child is a passive victim of television. Gardner says that, on the other hand, there is a great deal of evidence that the children are active transformers of what they see on television. He concludes that during the early childhood years, television is a great stimulator.

Similarly, it is often assumed that television has a negative effect on school achievement and reading. In reality, it has little effect if the home environment establishes rules that control the negative influences of television. In fact, for some students with difficulty in reading, it can provide another source of vocabulary and language development. Television can assist with reading and school readiness. A 1988 study by Anderson and Collins investigated the premise that television viewing has a detrimental effect on the cognitive development of children. They found that children comprehend programs produced for them, that they are cognitively active during learning, and that effect on reading achievement is small relative to other factors (Anderson & Collins, 1988). Generally, the evidence shows that moderate amounts of television viewing are positively related to academic achievement, while heavy viewing is negatively associated.

Another myth is that television is a great leveler because rich and poor alike watch the same programming. It is obviously an oversimplification to assume that all variables including socioeconomic ones are thus equalized by watching the same television programs. It would be more accurate to say that television can help provide a common conceptual framework for a community. Socioeconomic groups use television differently, and television has different effects on these groups. Lower-income children watching Sesame Street gained more in every area except knowledge of the alphabet (Zill, Davies & Daly, 1994). On the other hand, the more educated the family, the more likely there will be supervised use of television. Children who experience rules related to television viewing are likely to gain the most from the television experience. Television may be helpful to individuals from a lower socioeconomic class because it provides stimu-

lation rather than displacing more valuable activities. Television has the potential both to positively and negatively affect minorities' self-concept (Stroman, 1991).

Another common belief is that television causes violent behavior. The research shows that while there is a relationship between television and aggression (see 4.4.4.3), the effects of this relationship vary depending on individual and environmental variables:

In sum, the empirical and theoretical evidence suggests that in general the effects of television's content depend in part on the extent to which contradictory messages are available, understood, and consistent. In the case of sex role attitudes, messages from television are consistent and either absent or reinforced in real life, whereas in the case of aggressive behavior, most viewers receive contradictory messages from both sources. All viewers may learn aggression from television, but whether they will perform it will depend on a variety of factors. If we wish to predict behavior, that is, performance, we need to know something of the viewers' social milieu (Williams, 1986, p. 411).

It is true that research has shown that television has the potential to incite aggressive or antisocial behavior, to create problems resulting from advertising, and to portray characters in ways that foster stereotypes. Despite these potentially negative effects, television has the capability to educate, stimulate, persuade, and inform. Enough is known about how to use television positively to make a difference; however, the research has not led to successful interventions.

There are several reasons for this: the lack of conceptual theory relating findings, poor dissemination of findings, and little support for interventions.

What is most remarkable about the literature on learning from television is that the concerns haven't changed greatly in 40 years. Although the research questions have become more sophisticated as the medium evolved, the same issues—i.e., violence, commercialism, effect on school achievement—have continued. Yet, while interest in the negative aspects of television remains steady, efforts to increase positive effects seem more sporadic. Interventions are tried and discarded even if successful. The research on prosocial effects is reported and largely ignored. In fact, there is the danger that applying some of these findings could fuel a debate about "political correctness" that could lead to loss of funding. Perhaps the reason there seems to be less progress than warranted after 40 years is that the emphasis on negative effects has been more salient than efforts to ensure positive effects through interventions. Far more attention needs to be paid to the positive effects of television on learning and the potential for overcoming negative effects with these positive effects.

We would like to conclude by stressing the importance of emphasizing the positive through research on interventions, rather than through perpetuation of myths that empha-

size negative effects. If this review has revealed anything, it is that the findings on learning from television are complex and so interrelated that there is a great danger of oversimplification before research can provide adequate answers to sophisticated questions. Other reviews, such as Signorielli's *A Sourcebook on Children and Television* (1991), have reached similar conclusions. It seems important, therefore, to urge action in areas where research or intervention is both needed and supported, but to caution about sweeping generalizations that create distortions that affect policy. Finally, we hope that by extending this review beyond the usual consideration of either mass media literature or literature from instruction to a review combining both, we have established support for increased attention to design factors and to interventions that affect utilization.

A conscious effort by teachers and parents to use television positively makes a difference. Discussion of programming, for example, enhances learning through elaboration and clarification. However, most parents who think they discuss television with their children do so only in a minimal way. Therefore, the belief that parents and teachers guide the use of television is a myth. Generally, they don't. Neither teachers nor parents are given assistance in developing the skills to intervene successfully in the television-viewing experience.

From the research, one can surmise that different variables are important at different points in the life span of viewers. Thus, research on preschool viewers concentrates on mental processing, imagination, and attention span, while research on school age viewers asks questions about television's effect on school achievement and language development. Research with adolescents turns to questions of violence and the learning of roles and prosocial behavior. Adult learners are questioned about attitude change and viewing habits. These foci cause discontinuities in the literature because the same research questions are not asked across all life span periods. Thus, we know very little about the mental processing of adults viewing television or the effect of television on adult achievement. One recommendation for a research agenda would be to ask the same questions about all life span periods.

In pursuing the same questions across different life span periods, researchers need to ensure that self-reporting instruments measure the same phenomena for each age studied. When data are collected through self-reporting measures such as interviews, questionnaires, and psychological tests, there are limitations to take into account. Self-reporting instruments are used less effectively with young children and those with language disabilities. Moreover, subjects of different ages may interpret questions differently due to comprehension or interest. In addition, respondents may try to present themselves in a positive or socially desirable manner, thus misleading the researcher (Sigelman & Shaffer, 1995).

Which brings us to final conclusions. The need to study research questions through a variety of methodologies appropriate to respective variables and through investigations of interactions among variables is apparent from this review. One can only hope that enough researchers become interested enough, especially those open to interdisciplinary research, to provide some of the answers society, teachers, and parents need.

11.10 GLOSSARY OF TERMS

Active Theory Describes the child as an active processor of information, guided by previous knowledge, expectations, and schemata (Anderson & Lorch, 1983).

Aggression An antisocial "behavior, the intent of which is injury to a person or destruction of an object" (Bandura, Ross & Ross, 1963, p. 10).

Aided Recall When interviewers probe for further detail by cuing (Gunter, 1987, p. 93).

AIME The amount of invested mental effort in nonautomatic elaboration of material (Salomon, 1981a, 1981b). Theory that the amount of invested mental effort that children apply to the television-viewing experience influences their program recall and comprehension (Sprafkin, Gadow & Abelman, 1992, p. 55).

Altruism The prosocial "unselfish concern for the welfare of others" (Neufeldi & Sparks, 1990, p. 18). Evidenced by generosity, helping, cooperation, self-control, delaying gratification, or resisting the temptation to cheat, lie, or steal.

Antisocial Behavior Behavior that goes against the norms of society, including "physical aggression, verbal aggression, passivity, stereotyping, theft, rule breaking, materialism, unlawful behaviors, or pathological behavior" (Hearold, 1986, p. 81).

Arousal Theory Contends that communication messages can evoke varying degrees of generalized emotional arousal and that this can influence any behavior an individual is engaged in while the state of arousal persists (Sprafkin, Gadow & Ahelman, 1992, p. 79).

Attention The cognitive process of orienting to and perceiving stimuli. With regard to television research, this may be measured by visual orientation to the television or "looking" by eye movements, by electrophysiological activity, and by inference through secondary recall and recognition tests (Anderson & Collins, 1988). See Visual Attention.

Attentional Inertia "The maintenance of cognitive involvement across breaks or pauses in comprehension and changes of content" (Anderson & Lorch, 1983, p. 9).

Attribute A characteristic of programming, such as of advertising, e.g., uses hard-sell tone. See Formal Features.

Audience Involvement The degree to which people personally relate to media content; one dimension of the construct audience activity (Perse, 1990, p. 676). Indications of audience involvement include anticipating viewing (intentionality), attention (focused cognitive effort), elaboration (thinking about content), and engaging in distractions while viewing.

Broadcast Television Refers to any television signal that is transmitted over FCC-regulated and licensed frequencies within the bandwidth of 54 to 890 megahertz. Broadcast television messages may be received by home antenna, or they may be relayed via cable, satellite, or microwave to individual subscribers.

C-Box A recording device consisting of a television set and a video camera that records the viewing area in front of the television set.

Cable Access Television (CATV) Used to describe the distribution of broadcast, locally originated, or subscription television programming over a coaxial cable or fiber optic network. Such distribution frequently includes locally produced or syndicated programming intended for specialized audiences; also known as narrowcasting.

Catharsis Theory "Frustration produces an increase in aggressive drive because the state is unpleasant and the individual seeks to reduce it by engaging in either aggressive acts or fantasy aggression" (Sprafkin, Gadow & Abelman, 1992, p. 79).

Catharsis "The notion that aggressive impulses can be drained off by exposure to fantasy aggression (Liebert & Sprafkin, 1988, p. 75); drive reduction (Feshbach & Singer, 1971, p. 39).

Closed-Circuit Television (CCTV) Refers to the transmission of the television signal over a wire or fiber optic medium. The most important aspect of closed-circuit television for education is the ability to distribute a television signal within a school building or district. Also called wire transmission (which includes fiber optic transmission).

Cognitive Processing Refers collectively to the various mental processes involved in perception, attention, semantic encoding, and retrieval of information from memory. Typically used to describe activities associated with learning.

Cohort "A group of people born at the same time, either in the same year or within a specified, limited span of years (Siegelman & Shaffer, p. 18).

Commercial Broadcast Stations Stations that are privately owned and supported primarily by commercial advertising revenues.

Communications Satellite Refers to the transmission and reception of a television signal via a geocentric communications satellite. This form of communication link involves the transmission of a television signal to a satellite (uplink) that is placed in a geocentric orbit (one that is synchronized with the rotation of the Earth so as to appear motionless over approximately one-third of the populated planet). The satellite then rebroadcasts the signal to dish-type receiver antennas at other geographic locations (downlink).

Comprehension The extraction of meaning; the first step in critically analyzing any presentation regardless of medium (Anderson, 1983, p. 318). Comprehension may include the ability to recall or recognize content information and to infer story sequence or plot.

Content Indifference The theory that content does not dictate viewing; that, with a few exceptions, other variables have more effect on preferences (Comstock & Paik, 1991, p. 5).

Coviewing Viewing television in the presence of others, for example, viewing in a group of two or more, such as with a parent, child, or peers.

Critical Viewer “One who can first grasp the central meaning of a statement, recognize its ambiguities, establish its relationship with other statements, and the like; one who plans television viewing in advance and who evaluates programs while watching” (Anderson, 1983, pp. 313—318).

Critical-Viewing Skills The competencies specified as objectives for television literacy curricula.

Cross-Sectional Method A research method that involves the observation of different groups (or cohorts) at one point in time.

Cued Recall Recall based on questions about specific program details (Berry, 1993, p. 359).

Desensitization A decline in emotional arousal or the decreased likelihood of helping victims of violence due to repeated exposure to violent programming.

Disability “Any restriction or lack (resulting from an impairment) of ability to perform an activity in the, manner or within the range considered normal for a human being” (Cumberbatch & Negrine, 1992, p. 5).

Disclaimer Aural and/or visual displays designed to delineate an advertised item’s actual performance and to dispel misconceptions that might be created by demonstration of a product (Jalongo, 1983, p. 6).

Disinhibition Temporary removal of an inhibition through the action of an unrelated stimulation.

Disinhibitory Effects “The observation of a response of a particular class (for example, an aggressive response) that

leads to an increased likelihood of displaying other different responses that belong to the same class” (Liebert & Sprafkin, 1988, p. 71).

Displacement Hypothesis The notion that television influences both learning and social behavior by displacing such activities as reading, family interaction, and social play with peers (Huston et al., 1992, p. 82).

Displacement Theory Other activities are replaced by watching television.

Distractions Alternatives to television viewing such as toys, other children, music, or some combination of these.

Educational Television (ETV) Consists of commercial or public broadcast programming targeted at large audiences over wide geographic areas, with the express purpose of providing instruction in a content or developmental area.

Effect Size In meta-analysis studies, “The mean difference between treated and control subjects divided by the standard deviation of the control group” (Hearold, 1986, pp. 75—76). See Meta-analysis.

Ethnic Identity The “attachment to an ethnic group and a positive orientation toward being a member of that group (Takanishi, 1982, p. 83).

Experience-Sampling Method The use of paging devices to gather data on television activities and experiences.

Exposure Measures Measures of hours of television watched per day or of watching specific content, e.g., frequency of watching news (Gunter, 1987, p. 125).

Family Context for Viewing An environmental context that influences what and when viewing occurs as well as the ways in which viewers interpret what they see (Huston et al., 1992, p. 99); created through the interaction of variables in the home setting that mediate the effects of television, including environment, coviewing, and viewing habits.

Filmic/Cinematic Code Describes the collective formal features of television as a symbol system unique to both film and television (Salomon, 1979).

Formal Features Program attributes that can be defined independently from the content of a program, such as action, pace, and visual techniques (Huston & Wright, 1983). Synonymous with Production Effects or Presentation Effects.

Formative Evaluation Gathering information on the adequacy of an instructional product or program and using this information as a basis for further development (Seels & Richey, 1994).

Free Recall Recall where viewers must recall all they can from a specified program [without cues] (Berry, 1983, p. 359).

Frustration A state caused by “delay in reinforcement” (Bandura & Walters, 1963, p. 116).

Functional Displacement Hypothesis One medium will displace another when it performs the function of the displaced medium in a superior manner (Comstock & Paik, 1991, p. 78).

Genre A category of programming having a particular form, content, and purpose as in comedy, news, drama, MTV.

Grazing Quickly sampling a variety of programs using remote controls while viewing.

Household Centrality Dimension reflecting behavior and norms that favor viewing (Comstock & Paik, 1991, p. 69).

Incidental Effects Those behavioral or cognitive outcomes that result as a byproduct of the programming. These are usually not planned and may be negative or positive in nature. They may result from observational learning, role modeling, pro- or antisocial messages, or attitude formation.

Instructional Films/Motion Pictures Motion pictures that have been designed to produce specific learning outcomes through the direct manipulation of the presentation format and sequence.

Instructional Television (ITV) Programming that has as its primary purpose the achievement of specified instructional objectives by students in school settings. In practice, it has usually referred to programming that is formally incorporated into a particular course of study and presented to intact classes or groups of students or trainees.

Instrumental Viewing Watching for information.

Intentional Effects Those mental processes or behaviors that

occur as a direct result of organized instructional events or practices and that are generally expected to occur through the viewer’s interaction with the television programming.

Kinescope Medium consisting of a motion picture recording of a live television program, in which the television frame rate was synchronized with the film frame rate.

Learning from Television Changes in knowledge, understanding, attitudes, and behaviors due to the intentional or incidental effects of television programming.

Literacy “One’s ability to extract information from coded messages and to express ideas, feelings, and thoughts through them in accepted ways; the mastery of specific mental skills that become cultivated as a response to the specific functional demands of a symbol system” (Salomon, 1982, p.7).

Longitudinal Method A research method that involves the observation of people or group repeatedly over time.

Mass Communication “The process of using a mass medium to send messages to large audiences for the purpose of informing, entertaining, persuading” (Vivian, 1991, p. 15).

Mass Media Delivery systems (i.e., television, newspapers, radio) that channel the flow of information to large and diverse audiences and that are characterized by unlimited access, and by the vast amount of noncontent-related (incidental) learning that occurs as a byproduct. Generally intended to provide entertainment-oriented programming. See Mass Communication.

Materialism “An orientation emphasizing possession and money for personal happiness and social progress” (Ward & Wackman, 1981, cited in Moore & Mosehis, 1982, p. 9).

Media Dependency Relying on the media for information and guidance (Comstock & Paik, 1991, p. 143).

Media Literacy The ability to learn from media; capable of comprehending filmic code. See Literacy and Visual Literacy.

Mediation “Parents or teachers intervening in the television viewing experience by encouraging, discouraging, or discussing viewing” (Lin & Atkin, 1989, p. 54).

Mesmerizing Effect Describes a passive, hypnotic state in the viewer, presumably associated with reduced cognitive processing and high alpha activity (Mander, 1978).

Message “A pattern of signs (words, pictures, gestures) produced for the purpose of modifying the psychomotor, cognitive, or affective behavior of one or more persons” (Fleming & Levie, 1994, p. x).

Message Design “Planning for the manipulation of the physical form of the message” (Grabowski, 1991, p. 206).

Meta-analysis “A statistical approach to summarizing the results of many studies that have investigated basically the same problem” (Gay, 1992, p. 590). See Effect Size.

Microwave Relay Links Technology that employs a series of microwave transmission towers to transmit and relay the television signal. Such transmission is generally used in areas where cable distribution systems are not practical or where television network signals must be transmitted over long distances. Microwave relays are also used to transmit location broadcast signals from remote locations to the television studio for news or public-events coverage.

Monitoring Attention to audio, visual, and social cues as to the desirability of paying attention to the screen (Comstock & Paik, 1991, p. 23).

Montage Television sequence that incorporates formal features to imply changes in space, time, action, mental state, or character point of view (Anderson & Field, 1983, p. 76).

Neutral Behavior Behavior that observers would not describe as being antisocial or prosocial (Hearold, 1986, p. 81).

Norm Belief held by a number of members of a group, that the members ought to behave in a certain way in certain circumstances (Holmans, 1961, p. 6).

Oversensitization As a result of overexposure to televised violence, the belief that the world is mean and scary or that the incidence of crime and risk of personal injury are greater than they really are.

Parental Attitude “Parents’ perceptions of television’s impact on their children” (Sprafkin et al., 1992, p. 103).

Passivity Acted upon rather than acting or causing action.

Presentation Variables See Formal Features.

Processing Capabilities “The ability of a medium to operate on available symbol systems in specified ways; in general, information can be displayed, received, stored, retrieved, organized, translated, transformed, and evaluated” (Kozma, 1994, p. 11).

Production Effects See Formal Features.

Prosocial Behavior Behaviors that are socially desirable and that in some way benefit another person or society at large (Rushton, 1979, cited in Liebert & Sprafkin, 1988, p. 228). Includes behaviors such as generosity, helping, nurturing, or delaying gratification.

Public Stations Stations that derive their funding from government, public, and philanthropic sources. On such stations, commercial messages are either not aired or are used only for the recognition of the contributor.

Reactive Theory Describes the child as a passive, involuntary processor of information who simply reacts to stimuli (Singer, 1980).

Recall Memory for content and features from television viewing; can be cued or uncued.

Recapping Refers to repeating the most important facts; it is a source redundancy (Son, Reese & Davie, 1987, p. 208).

Receivership Skills “The comprehension of overt and hidden meanings of messages by analyzing language and visual and aural images, to understand the intended audiences and the intent of the message” (Brown, 1991, p. 70).

Recognition “Refers to the frequency with which a group receives TV roles at all” (Liebert & Sprafkin, 1988, p. 187).

Respect “Refers to how characters behave and are treated once they have roles” (Liebert & Sprafkin, 1988, p. 187).

Ritualistic Viewing Watching for gratification.

Roles “Refers to expectations about activities that are performed and to beliefs and values attributed to performers” (Birenbaum, 1978, pp. 128—129).

Rulemaking Establishing guidelines about acceptable and/or prohibited behavior (Lin & Atkin, 1989, p. 54); “also called restrictive mediation” (Atkin, Greenberg & Baldwin, 1991, p. 43).

Salience Highlighting certain components of the program for viewers through formal or production features; perceptual salience may elicit and maintain attention and influence comprehension by aiding in selection of content (Huston & Wright, 1983, p. 44).

Schemata “Conceptual frames of reference that provide organizational guidelines for newly encoded information about people and social or behavioral roles and events; they can be important mediators of learning” (Taylor & Crocker, 1981, cited in Gunter, 1987, p. 65).

Self-Control “Specific kinds of prosocial action, including a willingness to work and wait for long-term goals, as well as the ability to resist the temptation to cheat, steal, or lie” (Liebert & Sprafkin, 1988, p. 229).

Sequential Method A research method that combines cross-sectional and longitudinal approaches by observing different groups at multiple points in time.

Sex Role “Refers to the collection of behaviors or activities that a given society deems more appropriate to members of one sex than to members of the other sex” (Durkin, 1985, p. 9). Social Learning Theory (1) Acquiring symbolic representations through observation. (2) Learning through imitation of observed behavior (Bandura & Walters, 1963).

Socialization Learning the values, norms, language, and behaviors needed to function in a group or society; socialization agents often include mass media, parents, peers, and the school (Moore & Moschis, 1982, p. 4). Learning over time how to function in a group or society by assimilating a set of paradigms, rules, procedures, and principles that govern perception, attention, choices, learning, and development (Dorr, 1982).

Stereotype “A generalization based on inadequate or incomplete information” (Stern & Robinson, 1994), “A group is said to be stereotyped whenever it is depicted or portrayed in such a way that all its members appear to have the same set of characteristics, attitudes, or life conditions” (Liebert & Sprafkin, p. 189).

Summative Evaluation “Involves gathering information on adequacy and using this information to make decisions about utilization” (Seels & Richey, 1994, p. 134).

Symbol Systems Sets of symbolic expressions by which information is communicated about a field of reference, e.g., spoken language, printed text, pictures, numerals and formulae, musical scores, performed music, maps, or graphs (Goodman, 1976, cited in Kozma, 1994, p. 11).

Technology ““The physical, mechanical, or electronic capabilities of a medium that determine its function and, to some extent, its shape and other features” (Kozma, 1994, p. 11).

Television Literacy Understanding television programming, including how it is produced and broadcast, familiarity with the formats used, ability to recognize overt and covert themes of programs and commercial messages, and appreciation of television as an art form (Corder-Bolz, 1982, cited in Williams, 1986, p. 418). Also see Critical-Viewing Skills.

Video Production Producing television programming in the community or schools.

Videotape Format generally used today to record and play back video programming. It consists of an oxide-coated roll of acetate, polyester, or mylar tape on which a magnetized signal is placed.

Viewing Environment A social context created by the interaction of variables, such as the number and placement of sets, toys, and other media, other activities, rules, and parental communication.

Viewing Experience Result of interaction of programming, mediating variables, and outcomes; variously described as active or passive and positive or negative. See Viewing System.

Viewing Habits When and what children watch and for how long as determined by the amount of time a child spends in front of a television set, program preferences, and identification with characters (Sprafkin et al., 1992, p. 23).

Viewing Patterns Content preferences of viewers.

Viewing System Components of the viewing process, including programming, environment, and behavior and their interaction. See Viewing Experience.

Viewing Visual attention to what is taking place on the screen (Comstock & Paik, 1991, p. 22).

Violence ““The overt expression of physical force against others or self, or the compelling of action against one’s will on pain of being hurt or killed” (NIMH, 1972, p. 3).

Visual Attention ““Visual orientation (eyes directed towards the screen) and visual fixation (precise location on the screen toward which eyes are directed given visual orientation)” (Anderson & Lorch, 1983, p. 2).

Visual Literacy The ability to understand and use images, including the ability to think, learn, and express oneself in terms of images (Braden & Hortin, 1982, p. 41). See Media Literacy.

Zapping Changing channels quickly using a remote control.