Mass Communication and Information Diffusion

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SOCIAL COMMENTATORS AND OBSERVERS of the changes in modern society are continually amazed by mounting evidence of an incredible increase in the information that flows through society. The rapid diffusion of the electrical devices of radio, television, and more recently the computer, is usually taken as the most impressive evidence on this score, and incipient innovations such as cable television, home video recorders and computer terminals promise to accelerate this "information explosion" even more rapidly in the not-too-distant future. Moreover other indicators point to much the same conclusion: the tremendous proliferation of magazine and book titles over the last 25 years, the increasing audience for education television, and, for the critics of the "vast wasteland" of commercial television, reports from experienced kindergarten and first grade teachers that their students come to school with far greater verbal skills and wider interests than their predecessors.

Against such an impressive array of evidence, elements of which are well wired into the conventional wisdom, the mass communication researcher usually encounters at best a skeptical audience to his proclamation that research fails to corroborate any such utopian effects of the media. To be sure, the researcher does find that people already well informed can become better informed by attention to the media, but for any particular topic these people do constitute a small, and often insignificant, segment of the total mass audience. Such results are consistent with findings from research into the media's effects on audience propensity to engage in violent behavior, to

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become unduly swayed in their political or electoral decisions, to become less intellectually active as a response to the easier availability of media fare, as summarized in Klapper's (1960) famous summary of the research literature:

> Regardless of the condition in question—be it the vote intentions of audience members, their tendency toward or away from delinquent behavior, or their general orientation toward life and its problems—the media are more likely to reinforce than to change.

But converging evidence of this sort is still likely to be of little consolation to persons conditioned to the argument that modern man's increased exposure to media[1] and other information sources has inevitably resulted in him becoming more informed, occasionally to the point of information overload, than he was in prior eras.

Public opinion researchers have perhaps uncovered the most persuasive evidence of the failure of all segments of the population to share in the information explosion, with their documentation of the shocking ignorance of the American public on matters of basic national concern. In 1964, half of a national sample were unaware of the existence of two Chinas with their opposing political loyalties (Robinson, 1967). In 1969, a CBS survey found only a third of the country had heard of the Kerner Commission Report. In a 1970 national survey, less than a third of the population could provide even rudimentary identification of Ralph Nader, Robert Finch, or Martha Mitchell (Robinson, 1972). Collections of further items on which the public seems ill informed have been provided in Lane and Sears (1964), Erskine (1962, 1963a, 1963b), Schramm and Wade (1967) and Robinson (1967).

Moreover the evidence has been slowly accumulating that more directly links these discouraging information levels to a dearth of information flow from the media to the public, even if one talks only of the actual audience for any given message and excludes the usual majority of the public who are not in the audience at the time of the message. McLeod and Swinehart (1960) found almost no increase in public awareness of the detailed scientific purpose of space satellites six months after extensive media coverage of the implications of the launching of Sputnik I. Robinson and Hirsch (1969) found teenagers unable to describe even the basic themes, much less the subtle meanings, of the lyrics in various popular "message" songs which had received maximum exposure on Top 40 radio stations and which most teenagers indeed claimed to have heard. More disturbing is Stern's (1971) finding that half the audience of a national network news program could not recall even one of the 19 news stories on the program shortly after they were broadcast. . . .

Now to some extent, the above collection of research is an exaggeration to make a point seldom acknowledged in intellectual debates about the power of the media. Mass communication and public opinion researchers do have evidence of apparently successful transmission of information from the media to the public. Some of these will be examined later in the article. Thus, in

the McLeod and Swinehart investigation (1960), the proportion of the population able to describe the less detailed purposes for satellites doubled (although only from 8 to 16 percent) and those larger proportions of the population who saw satellites as the basis of a race with the Russians may have been simply reflecting the framework in which the news media interpreted the importance of Sputnik I. It is unlikely that widespread public awareness of the dangers of cigarette smoking, the signs of cancer, or the causes of forest fires would be possible without the torrent of public service announcements through the media. Public opinion researchers find so few people unable to complete the beginnings of commercial slogans and jingles (Ward, 1972) that they can hardly dismiss the power of media advertising. . . .

How has it been possible for researchers to compile such a dismal scorecard on the effectiveness of the media in conveying news information? One researcher, William McPhee (1956) developed the following line of explanation:

> Imagine trying to transmit complex and sophisticated knowledge to students who walk in and out as they please, when some of the most valuable effects might occur to a passerby who wanders in by chance, when most volunteer students already know what is to be learned, while those who do not already know are not available, when motivation is low, and when neither the subjects nor the teacher have any clear idea about the rewards for learning.

To this, one might add the coping and perceptual mechanisms whereby the public protects itself from the bombardment of media information to which it is exposed. It has been estimated that the average American is exposed to hundreds of messages just about advertising on an average day. Add to this all the "bad news" messages propagated by the news media and it is not difficult to imagine why the audience is highly selective about what news it chooses to attend to or seek out in the media.

More fundamental reasons may be involved. News changes daily and hence cannot be packaged as neatly as a classroom lecture. It is not difficult to imagine that news messages and arguments, designed by news personnel who have undergone considerable exposure to the disciplines of advanced education, could be too difficult to comprehend by a mass audience composed of less than 15 percent college graduates. Moreover, few news stories would seem to provide the fuel for as lively interpersonal conversation among peers in the general public as it would among average members of the news profession, and communications research offers ample evidence of interpersonal conversation being a more powerful transmission mechanism than the media (Weiss, 1970), even among the elites in our society (Bauer et al., 1963).

The research evidence in the following section can be conveniently explained by and subsumed under the above type of arguments. However, while most research results are consistent with this formulation, which builds upon a model of a series of segmented media audiences who tend to become increasingly dissimilar from one another, a significant body of research points to

quite different processes of information flow that may operate under certain conditions. These divergent research findings and conditions are then reviewed in the subsequent section, before some final implications and conclusions are drawn.

Media Usage and Information Levels

There are, first of all, strong linkages that are found between media usage and information. Briefly stated, heavier users of print media are better informed than light users or nonusers.[2] It is immediately obvious, however, that there are intervening audience factors that need to be taken into account in such a formulation. Of the several factors in the audience itself, research indicates that the extent of the audience member's exposure to formal education is the most powerful factor intervening between media usage and information level.

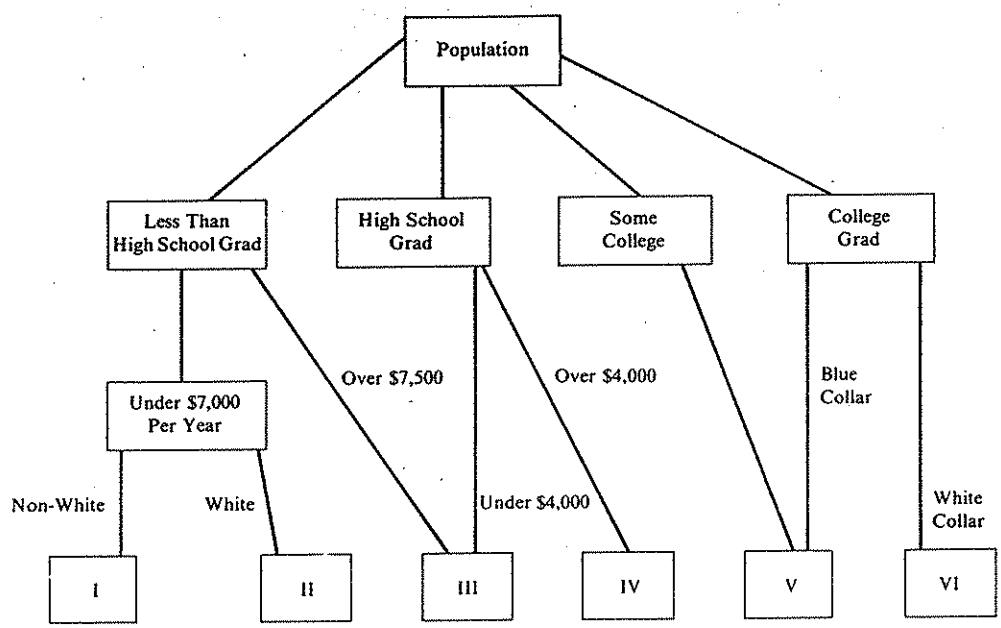
For example, Figure 1 breaks the American population down into six groups that were maximally different in terms of their information about the Far East in 1964 (Robinson, 1967). The information index was based on answers to the following four questions:

1. What kind of government does most of China have?
2. Have you heard anything about another Chinese government?
3. Has the U.S. been treating China and Russia the same or differently?
4. Have you heard anything about the fighting in Vietnam?

The average score in the population on this index, which runs between 0 (no correct answers) and 4 (four correct answers), was 2.2, a score not significantly better than what could be achieved by unembarrassed guesswork on the part of a respondent. Group I (that 9 percent of the sample who were nonwhites with less than a high school education, earning under $7,500 per year) averaged just over half of one of the four questions correct compared to that 10 percent of the sample in Group VI (college graduates in white-collar jobs) who achieved a nearly perfect score of 3.6 items correct. While other factors were important in predicting public knowledge of these items,[3] it is obvious from Figure 1 that education was the dominant factor in distinguishing the six groups in terms of their information levels.

Thus, when one finds significant parallel differences in mass media usage among these six groupings of the population, one strongly suspects that education is the major factor at work here as well. The data are presented in Table 1 and show proportions of a 1958 national sample[4] claiming various usage of the media. While only 1 percent of persons in the Group I category reported reading a nonfiction book in the previous year, almost one in four persons in Group VI did. Even readership of *Look* and *Life*, "magazines for people who can't read," was four times higher in Group VI than in

FIGURE 1. Combinations of Background Factors for Each of the Six Groups Within the United States Population Showing Large Differences in Information Scores About the Far East



	I	II	III	IV	V	VI
Percent of Population	9	27	12	29	13	10
Average Information Score	6	1.7	2.2	2.8	3.2	3.6

Note: Percentage of population estimates are based on the same Survey Research Center data as are the average information scores. Maximum information score = 8.

TABLE 1. Percentage Within Each Social Group in Eight Separate Types of Sophisticated Usage[a]

Group	Books (Non-fiction)	Analytic Commentary Magazine	News and Business Magazine	Pictoral and Interest Magazine	Read all or most Foreign News in Paper	Read at least some Foreign News in Paper	Listen to News on Radio	Watch News on TV
I	1	0.0	3	15	7	27	49	10
II	5	0.2	3	21	15	45	58	25
III	8	0.4	9	37	20	63	63	28
IV	8	1.1	13	47	25	69	57	33
V	15	0.5	24	53	36	80	62	34
VI	24	10.0	44	61	40	83	69	42
Total Sample	8	1.1	11	34	21	57	59	28
National Opinion[b] Leaders (Rosenau)	17	30 (est.)	60 (est.)	12 (est.)	NA	94 (est.)	10 (est.)	10 (est.)
National Business Leaders (Bauer et al.)	NA	20 (est.)	88 (est.)	40 (est.)	NA	98 (est.)	NA	NA

a. 1957 Survey Research Center data.
b. See Text for explanation of the Rosenau, Bauer et al. data.

Group I. Similar differences are found for readership of foreign affairs news in the newspaperand claiming news to be among one's usually viewed television programs and, to a much lesser extent, claiming news to be among one's usually heard radio programs.

These two sets of data on information and media usage, unfortunately taken six years apart, still strongly point to a strong relation between the two variables mediated by the factor of education. That is, it is the best educated segments of our population who are both well informed and who keep themselves better informed by more serious usage of the mass media for informational content. Nevertheless these data refer to aggregated groupings in the population and cannot be used to imply that such processes hold for individuals in the society. Indeed, one of the well-known methodological caveats of social science research is that relations that hold for aggregates oftentimes do not hold at the individual level (Robinson, 1950).

However, a study of adults in the Detroit, Michigan area in 1964 did collect simultaneous data on media usage, information level (again about foreign affairs) and education. These data not only corroborate the Figure 1 and Table 1 aggregative findings (Robinson, 1967), but also verify that the above interpretation holds at the individual level as well.[5]

Recent data from more appropriately designed national samples have not only extended these results to information areas beyond foreign affairs, but have allowed analyses by sophisticated multivariate methods, more appropriate to verifying the extent to which specific usage of each of the media predicts to information levels once other background factors are taken into account. . . . Data from the Survey Research Center's 1968 national election study do suggest that the various media do not perform the same functions in all segments of the poluation. Heavy usage of any medium seems to do little to raise information levels of college graduates, who are well informed whether they use the media or not. The same generally holds true, although not as strongly, and with some exceptions, for high school graduates. Among that majority of the population who did not graduate from high school, however, there are pronounced increases in information level associated with more regular usage of the media. While there are still significant differences between persons of different education levels, these become minimal among heavier users of the media. The data strongly suggest, therefore, that more extensive attention to the media can act to level the tremendous differences in information that obtain due to education. Somewhat similar conclusions were reached by Campbell (1966) in his analysis of political information data collected in the 1964 political campaign. . . .

A somewhat different tack characterized analysis of the public's ability to identify various people in the news[6] in a small 1970 national survey of television usage (Robinson, 1972). Instead of searching for the complex sort of interactions between variables uncovered in Figure 2, the attempt here was to examine how much of an overall idfference usage of each medium

made in explaining information levels, once other background factors (such as education, sex, age, race) and alternative media usage had been taken into account. All of these variables were subjected to a Multiple Classification Analysis (MCA), a recent computer program developed by Andrews et al. (1967) to examine the effects of single variables once the effects of all other variables are held constant.

The calculations of Table 2 result from applying MCA to these data. The first column of Table 2 refers to the average number of correct identifications for persons reporting various usage of each of the mass media and

TABLE 2. Average Number of News Personalities Recognized According to Media Usage (National sample)

		Deviation from Overall Mean	
		Before Correction	*After Correction*[a]
Hours of TV on an average day			
Less than 2 hours (n = 64)	1.9	+.4	+.1
Three hours (n = 172)	1.8	+.3	+.1
Four-five hours (n = 127)	1.3	−.2	−.1
Six or more hours (n = 67)	.6	−.9	−.2
Frequency of national news viewing			
At least twice a week (n = 270)	1.6	+.1	+.1
About once a week (n = 81)	1.8	+.3	+.1
Never (n = 82)	.7	−.8	−.3
Reads a news magazine			
Yes (n = 60)	3.0	+1.5	+.6
No, but reads other magazines (n = 214)	1.5	0	0
Does not read any magazines (n = 159)	1.6	−.7	−.2
Reads a newspaper			
Everyday (n = 293)	1.8	+.3	+.2
At least once a week (n = 99)	1.1	+.4	−.3
Less often (n = 41)	.1	−1.4	−.5
Hours of radio on an average day			
Less than 2 hours (n = 235)	1.5	0	0
Two-three hours (n = 113)	1.6	+.1	0
Four-five hours (n = 34)	1.2	−.3	−.3
Six or more hours (n = 51)	1.5	0	+.1
Number of movies seen (in previous three months)			
None (n = 270)	1.2	−.3	−.1
One-two (n = 116)	2.2	+.7	+.1
Three or more (n = 47)	1.4	−.1	+.1

a. After correction for usage of other media, sex, race, and education.

the second column refers to the deviation of these scores around the average score of 1.5 (out of a possible 7) correct identifications. Thus persons who report watching television less than two hours per day average 1.9 correct identifications, which is .4 identifications above the 1.5 general average. Entries in the third column refer to the average scores, once all the above-mentioned factors have been taken into account. Here persons who watch less than two hours of television per day now score only .1 identifications above the average, probably reflecting the lighter TV viewers' already-existing higher information levels and better education.

It can be seen that the figures in the third column indicate *print* media usage to be much more crucial in explaining differentials in information levels than does *broadcast* media usage. Readers of news magazines score .6 above average in information levels and nonreaders .2 below average, while regular newspaper readers score .2 above average and nonreaders .5 below average. In contrast frequent TV news viewers score only .1 above average and nonviewers of news programs only .3 below average. . . . Table 2 does not indicate heavy exposure to TV news leading to greater information accrual than occasional exposure.

Our confidence in the Table 2 results is strengthened when we find virtually the same pattern of results among a cross-section of 1,000 teenagers in a single large suburban county (Robinson, 1972) asked the same information and media usage questions. In fact, almost identical results were obtained when the analysis was performed on these teenagers' ability to answer factual questions about foreign countries.

Even further support for the applicability of these results in other areas of knowledge is provided by Schramm and Wade (1967). These authors conducted analyses parallel to those performed here for public awareness of health and science information. In both areas, print media usage was also found to predict to information levels better than broadcast media usage.[7]

Thus a substantial body of survey research data converges on the findings (a) that it is the best educated segment of society that keeps itself informed about what is happening in the world, and (b) that it is exposure to print media (the favored media mode of the better educated) which is mainly associated with greater likelihood of being informed or becoming better informed. These behaviors have recently been formally described under the hypothesis of an "increasing knowledge gap" by Tichenor et al. (1970). . . . which suggests that the mass media largely function to increase those already-existing gaps in information that separate the college graduate from the rest of society and hence may have been responsible for creating even wider divisions of opinion in our society than might have been the case without the media. Certainly the implications of these results need to be taken more seriously by media practitioners.

Tichenor et al. wisely note that their results largely were found with, and hence may only apply to, the print media and to academic "hard" news, i.e., items of public affairs and science rather than audience-specific topics (such as society news or garden care). It is to some similar exceptions to the above pattern of results, some of which do involve the "hard" news items that we have mainly discussed in this section, that we now turn our attention.

Exceptions to Restricted Information Flow

The above body of literature clearly suffers from a lack of cumulative research enterprises (in which investigators can build upon and extend findings from previous endeavors), but the following exceptions are gleaned from an even more diverse body of research and speculation. These exceptions mainly concern the *type* of information under consideration. That is, it appears that *some types* of information in the media *can be conveyed* to the broader mass audience—i.e., beyond simply those portions of the audience who are already predisposed to absorb the information. Nevertheless, our discussion will touch on other communication variables as well, particularly the type of medium (learning via print as opposed to broadcast media) under consideration.

There is, first of all, the type of information that media observers, following from Lazarsfeld and Merton (1948), have labeled "status conferral." That is, persons, issues, or objects to which the media pay attention have increased status conferred on them merely by being exposed to media attention. Weiss (1970) reviews several examples of this phenomenon, the most well accepted perhaps being the increased importance or salience in the public of issues discussed by candidates during political campaigns (e.g., Eisenhower's raising of the Korean War as a campaign issue in 1952, the issue of bombing the islands of Quemoy and Matsu in the Kennedy-Nixon debates). To this, one might add the apparent correlation between media coverage and public perception of important national problems in noncampaign periods (a recent example being media discussion of ecology and pollution problems). A similar connection is not unlikely for people in news, which perhaps explains why politicians are so anxious for media coverage.[8] Advertising, particularly brand-name advertising, seems predicted on the notion that the public will attach higher status to products that have been brought to their attention by the media. . . .

While this discussion borders on the highly speculative, it is precisely these more subtle and difficulty measured types of information on which appropriate research is in short supply. Despite Herzog's (1944) well-publicized and intriguing finding that soap-opera fans found in these programs solutions to and philosophies about their own everyday problems, researchers have yet to undertake systematic measurement of what people learn from

everyday dramatic media fare. Recent television surveys have demonstrated that the public generally perceives television dramatic programs as reflecting real life, and more viewers claim to learn something from their favorite dramatic programs than do not (Robinson, 1972). . . .

Finally, evidence now exists that information campaigns of the variety studied in Cincinnati need not be doomed to failure. Douglas et al. (1970) have reported a successful six-month media blitz to improve public information about the mentally retarded. Overall information levels on seven of ten information items examined were practically twice as high in the community subjected to the campaign as in a comparable community in which no special campaign was mounted. Moreover, those with least education picked up most campaign information. . . .

Summary and Conclusions

Like almost every other institution in society, abundant evidence suggests that the mass media tend to reinforce and accentuate existing conditions rather than promote egalitarianism or abrupt change, at least with regard to information diffusion. The evidence is persuasive and pervasive that persons already well informed are more motivated to become better informed through the mass media than persons less well informed. The shocking ignorance of American citizens on issues of vital political and personal concern testifies to the limited fruitfulness of the interaction between the mass media and the public in the governmental process. One suspects that persons who claim to be getting most of their information from television may be euphemistically reporting that they are not receiving much information at all about what is happening.

At the same time, there is precious little evidence that education, the variable which mainly determines the patterns and consequences of media usage examined in this chapter, itself has any effect. One study found college seniors no better informed about public affairs than their freshmen counterparts (Turner and McClintock, 1958). High school students[9] who have had a course in civics are no better informed about government affairs than those who have not (Jennings and Langton, 1968).

How then do we learn anything, if media and education institutions have so little effect? Communication researchers strongly suspect that the key element may lie in the pattern of one's interpersonal social contacts (see Chaffee's chapter on this point). Overwhelming evidence is available to suggest that interpersonal means are more persuasive than mass media appeals (Weiss, 1970); greater credibility and understandability are two of several obvious reasons Robinson (1967) cites for this.

Nevertheless the exact processes whereby information flows through social networks is not well understood. The earlier hypothesis of the two-step flow

of information from the media to "opinion leaders" to the rest of the public clearly distorts the nature and complexity of the information diffusion process. To be sure, one could almost define media information which fails to excite interpersonal discussion in the public as having the same impact as the philosophical tree falling in the wilderness. But exactly what information excites discussion, what norms and circumstances allow information transmission in ordinary conversation, how information gets distorted in interpersonal transmissions, or how lengthy or persuasive the claims of information are in these processes have only been vaguely touched in information diffusion research thus far.

The diffusion literature is far more valuable in suggesting an approach whereby media can exploit the powers of interpersonal communication. Rogers and Shoemaker (1971) mention several "media forms" that have worked out well in practice. Relevant individuals in a community are brought together as a group to listen to or watch a salient media presentation. Later, an extension worker leads a group discussion in which arguments in the presentation are debated and discussed in detail, hopefully pointing up irrational or invalid counterarguments. Although life in more modern societies is often too formal for such get-togethers to be practicable in the long run, the more likely the media practitioner successfully approximates interpersonal conditions, the more information will likely be conveyed.

Implicit in both this argument and in our discussion of the exceptions to our main rule-of-thumb is the need for more functional definitions of information so that institutions whose role it is to diffuse information through society should explore more utilitarian methods of reaching people with information they need when they need it. A recent synthesis of what is known about man's selective methods of attending to and processing information to which he is exposed (Sears and Foreman, 1968) concluded by reiterating a point made by researchers on the Cincinnati project, namely that people expose themselves to and absorb information which is useful. Whether one calls it useful or functional, a more rational approach to the business of reaching the public with information vital to a democratic society might begin by taking a thorough inventory of what it is that members of society would like to know more about, what they think they know and do not, and what might be a desirable mixture of the two from utopian conceptions of society. . . .

Notes

1. Evidence from research on how time is spent does suggest that the arrival of a television set results in about twice as much time spent in contact with all mass media as was spent previously (Robinson, 1969).

2. As we shall see below, heavy viewers of television *news* programs are about as well informed as light or nonusers. It is the heavy users of television *generally* who are less well informed.
3. In addition to income, race, and occupation (variables included in Figure 1), sex, age, region of country, and size of place, were consistent predictors of knowledge. Men scored half a point higher than women, persons aged 55–64 scored half a point higher than persons in other age groups, residents of the South half a point less than average, and residents of rural areas half a point lower than average—holding constant all the Figure 1 factors. These same factors were very much associated with amount of print news usage, a leading predictor of information level as noted below.
4. These 1958 data are used in Table 1 because they represent the only such data available from a national sample at approximately the same point in time. No media usage questions were asked of the 1964 sample.
5. One important difference in the Detroit study is that specific questions on the frequency of viewing news programs were asked about radio and television, rather than types of programs to which the set is *usually* tuned. The two types of questions produce somewhat different types of results because the better educated spend much less time in contact with the broadcast media, especially television (Robinson, 1969). For this reason, the Detroit study finds the better educated attending to radio and television news programs about as often as the rest of the population, rather than the higher frequency implied in Table 1. For more detailed breakdown of the audience for network television news programs, see Robinson (1971).
6. The seven news personalities whom the public was asked to identify were: Robert Finch, Bob Dylan, Calvin Hill, Joseph Tydings, Tom Hayden, Ralph Nader, and Martha Mitchell. Recognition levels for some of the individuals were described in the introductory portions to this chapter.
7. In the area of political information however, television usage was the stronger predictor. We shall review and discuss this datum in the following section.
8. The phenomenon may also account for participation in certain forms of abberrant behavior. On the one hand, the media confer "status" to some individuals who engage in such deviance and in so doing may create some greater acceptance of the behavior than existed before, and on the other, focus attention on the particular individual who has performed it. Other persons in the audience who feel they are not receiving the attention they deserve may thus engage in some form of the behavior to achieve a similar end. The descriptions of motivations of airplane hijackers, for example, seem consistent with such a formulation as does the rash of imitators who follow the methods of novel crime reported in the media. Certain accounts of James Earl Ray's behavior would be consistent with his murder of Martin Luther King for some status-conferral motivations.
9. Few teenagers use the media for informational purposes (Robinson, 1971). Perhaps this is because they seldom learn anything in their high school years about *how* to use the media for such purposes. Educational institutions could profitably incorporate liaisons with mass media (the other educational institution in society) into their curricula so that media could more efficiently continue the education process into and through adulthood. Otherwise we might continue with the competitive model implied in Marshall McLuhan's observation that the child goes to school to interpret his education.

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How Children Make Sense of Television

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CHILDREN, BUSY EXPLORING AND UNDERSTANDING OUR WORLD, seem for years to have constructed their own world out of pieces of ours. Within the changing limits of their information processing capacity, they construct models of the world as they expereience it. These models are then used to decode, encode, recall, and act. They make childhood a unique, but natural, period. The truth of this has been recognized for eons, captured in the biblical statement "When I was a child, I thought as a child . . . ," in Rousseau's admonitions (1762) to "leave childhood to ripen in your children" and to leave the mind "undisturbed till its faculties have developed," in Piaget's more than forty years of work (e.g., Piaget and Inhelder, 1969), and in current child development research (e.g., Kohlbert, 1969a; Shantz, 1975).

Yet an alternative characterization of children as tabulae rasae upon whom we "write" also has some demonstrated accuracy. It too has been endorsed throughout history in philosophical writings, in advice to parents and educators (e.g., Locke 1963; Spock, 1946), and in child development research (e.g., Bijou and Baer, 1961). If we are to progress in our understanding, this view of children as tabulae rasae must somehow be combined with the fact that they are also actively making their own sense of what we try deliberately or inadvertently to "write." Such activity may in significant ways alter the meaning of their experiences.

Much of the research on children and television to date could perhaps best be characterized as concerned with what happens when the black box transmits messages to the tabula rasa (see such recent reviews as Leifer,

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