MASS MEDIA AND ENVIRONMENTAL AFFAIRS
A CASE STUDY IN SANTOS, BRAZIL

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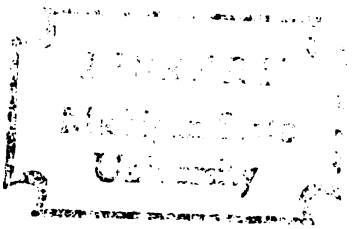
THESIS



ABSTRACT

MASS MEDIA AND ENVIRONMENTAL AFFAIRS
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By

Carlos Eduardo Lins da Silva

This work intends to investigate how mass media influence public's knowledge, attitudes, and behavior toward environmental issues and how media performance might help produce solutions to ecological problems.

The first part is a review of the available literature on the subject. The second part is the description of tests carried out to validate some broad hypotheses formulated on the basis of available research summarized in the first part.

In order to test the hypotheses, four survey instruments were used: a monitoring of Santos' mass media content during one month; questionnaires answered by media managers; one survey among a group of people already interested on environmental affairs; and a cross-sectional survey among a three hundred subject sample chosen through a multistage area sampling.

The following hypotheses were confirmed by the survey:

1. The first warning about environmental hazards are more likely to come from mass media than from any other source for most of the people. Mass media continue being the most important source of knowledge about environmental affairs for most of the people after that first warning. Mass media are also the main attitude shaper in Brazil, where the audience does not hold strong positions about these problems yet.

2. The public would like to have more specific information about how to act in order to solve environmental hazards. Mass media fail in furnishing to the public this kind of information. Further, media managers do not hold a special concern about the subject. Mass media information does not engage the audience in active participation.

3. People tend to have a favorable attitude toward environment, but they do not feel like changing their set of patterns for the sake of contributing for the solution of problems. They are not likely to go against their vested interests because of environmental quality. Most of the people believe the environmental problems are important, but not too much when compared with other more personal questions. They tend to see environmental problems as distant in the space.

The survey failed to confirm the predictions that:

1. Printed media seem to perform a more important role than electronic media both as source of information and attitude shaper on environmental affairs.

2. The public would like to have more information concerning the local environmental problems.

3. Media managers ordinarily do not rank environmental affairs at high levels of importance when compared with other issues.

4. People tend to feel their participation to solve problems as useless.

The first and fourth predictions were disconfirmed and there was not enough evidence to confirm or to reject the second and third predictions.

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A THESIS

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To

Nemercio Nunes Lins da Silva

and

Ruth Vasques Lins da Silva,

my parents

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Mr. and Mrs. Lins da Silva, whom this work is dedicated to, monitored mass media content in Santos during the month of March 1976 and collected the data referred to in section XI of this work.

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PART ONE

Introduction

This work intends to investigate how mass media influence public's knowledge, attitudes, and behavior toward environmental issues and how media performance might be improved, in order to make them help produce solutions to ecological problems.

The hypotheses will be stated based on research made under the American prior findings in the subject and will be tested in a Brazilian audience. The American secondary data constitute the first part of the work and the Brazilian primary data the second part.

Of course, this kind of design involves the work in the problems of cross-cultural research in Communication. Some of them were listed by Godwin Chu.[1] For him, when a research problem involves values, ideologies, social patterns, and experience, straight reapplications of experiments held in other culture is hardly feasible.

Such reapplication was not tried in this work. There was no attempt of translating experiments already made in the United States into Portuguese. The survey was

designed and applied based on a Brazilian background and also its interpretation.

Although this work did not have such kind of troubles, it does hold a drawback cited by Chu: if the findings confirm the hypothesis, we shall have evidence that the generality holds not only in another culture, but also for another experiment. But if the findings fail to support the hypothesis, then we do not know whether it is because of cultural differences or because of change of procedures or measurement which may lack reliability and validity.[2]

However, this is a risk that has to be faced and it does not differ too much from those faced in any social study. Another kind of problem is listed by Luiz Ramiro Beltran.[3] He cites the lack of a conceptual framework of its own in Latin America and criticizes the adoption of extraregional methodologies without further examination.

Armand Mattelart also sharply condemns the utilization of United States' communication research which is, in his opinion, "characterized by its preoccupation with effect of mass media on audiences perceived as potential markets" and does not show any concern with critics of the social system.[4]

It is possible that Mattelart may be right in his comments. Perhaps, however, it would be better to leave this kind of considerations to the sociologists and the political scientists. Furthermore, as Beltran acknowledges,

the type of approach recommended by Mattelart may also have its pitfalls: "On the other hand, some of the new breed of communication researchers clearly committed to social change in the region may be perpetuating a similar error by regarding their analyses as scientific even when they may actually be political essays with a revolutionary orientation."[5]

This work does not regard mass media audiences as "potential markets." Rather, it intends to be a contribution for mass media in Brazil, or any other country, to help solve the grave environmental menaces that face humankind nowadays. It uses an American base to state its hypotheses because it happens to be in the United States where the communication research has been most fertile. It would have been impossible to do the same based on Brazilian secondary data, for instance, because of the plain reason that there are no such data there.

Though recognizing the "dangers of transferring research findings from one culture to another, particularly in a field of study where theory is so impoverished,"[6] it is possible to admit that human beings hold many common characteristics all over the world, so that this kind of cross-cultural research may be, in some way, useful for the countries involved in it.

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CHAPTER I

WHAT MASS MEDIA CAN DO FOR ENVIRONMENTAL EDUCATION

It has been already enough proved by the available mass communication research that mass media are not all powerful in their attempts to influence audience.[1] However, their potentiality seems to be clear.

The simple deal of time that most people in urban areas of almost any country in the world spend with them secures to mass media a great influence over those people. Furthermore, the media use to enjoy great credibility among their audience, what confers them even more power.

The absence of any important system for formal adult education is another reason why information and opinions delivered through mass media is likely to be taken in large account by the public.

For all those reasons, and others, people involved with environmental education trust mass media as one of their most important tools to achieve their goals. These goals were well stated by William B. Stapp:

> Environmental education is aimed at producing a citizenry that is knowledgeable concerning the total

> environment and its associated problems, aware and skilled in how to become involved in helping to solve these problems, and motivated to work toward their solution.[2]

The faith environmentalists put on mass media as a powerful agent of environmental education achievements may be measured by this statement made by former United Nations Environment Program Executive Director, Maurice Strong:

> . . . the task of UNEP is impossible unless citizens everywhere seriously question the whole process of how man may continue to thrive and survive and to implement some of the emerging answers in their own lives. The role of the mass communication media in this process is crucial.[3]

The reliance is shared by government officers working in environmental problems, such as Stephen H. Barmakian, from the Public Information Center of the United States Environmental Protection Agency:

> . . . without communications both within the organizational structure (internal) and (external) to the enumerable outside audiences, environmental problems can neither be identified nor solved. Mass communication is particularly important because it spans the total environment and is in keeping with technological advances and the rapidity by which information is prepared and disseminated. Thus, mass communication is another tool for federal, state, and local agencies in their activities to control and abate pollution and protect and enhance environment. Informing and arousing citizens, unquestionably, is a vital element in developing support for environmental programs and efforts and in influencing public opinion. And this activity is engaged in by individuals and groups in the public as well as public sectors. Accordingly, print and electronic media can become powerful forces if employed constructively and with the expertise they require.[4]

The United States Office of Education, when stated the goals of its programs of environmental education, also

showed clearly its trust on the role mass media should perform:

> Nonformal education will reach important segments of the general public (and in some cases the entire population of a locality) with environmental education programs. This will be a major responsibility of local and national media, volunteer agencies, business and industry, and other private organizations. It is essential that both local and network television, radio, film studios, newspapers, magazines, and book publishers contribute increasingly to informing the public about critical environmental problems and their possible solutions. In addition, the vast advertising and promotional resources of business and industry may be directed toward environmental and ecological issues.[5]

If so much hope has been matched by media performance will be seen throughout the first part of this work. However, it should be noted that many serious authors believe that it has been. This is the case, for instance, of Rene Dubos, one of the scientists who first went to public to denounce the ecological hazards which menace mankind:

> . . . Any problem of environmental control first penetrates the public consciousness--here or in Western Europe--through the news media or a few books.
>
> A person like Rachel Carson writes a book, "Silent Spring," and everybody begins talking about environment. Newspapers, magazines and television pick it up. Four or five years later--and only then--do the politicians take notice and formulate laws.[6]

Other authors do not think it is so easy to establish the direction of casualty between media coverage, political activities and public concern.[7] But Dubos seems very confident on media's actions and also believes this action can be taken in time to solve the environmental problems. He cites an example:

> It was only two years and half ago that, for the first time, two scientists suggested that fluorocarbons from spray cans might endanger the ozone layer and bring about an increase in ultraviolet radiation. What I find encouraging is that this piece of information was rapidly disseminated, per haps because everybody is familiar with the spray can or because the phrase "ozone layer" is a catchy one.
>
> Anyway, last year, without any regulatory agency or court taking action, the sale of those spray cans decreased by some 25 percent, even though the scientific evidence is far from complete. More interesting is that several business firms have begun to put on the market other kinds of spraying equipment that don't use fluorocarbons.[8]

Although he seems so optimistic, Rene Dubos has stated elsewhere sadder perspectives for the future:

> . . . We do not like polluted and crowded environments, but we like much more economic prosperity and mechanic devices. Because of that, I doubt we can carry out seriously the social and technological reforms which are necessary for the environmental control, before great catastrophes do not force us to do that.[9]

But even with this more pessimistic approach, Dubos still relies on the power of organized public action and thinks there are historic precedents to justify his statements:

> . . . A similar situation happened in the beginning of 19th Century. Public pressure organized by enlightened laymen was the force which put the environmental problems in relevance to be solved by scientific effort. Once again, a popular movement is urgently needed to convince public officers and the scientific establishment that it must be given high priority to the study and control of forces which affect human life quality and its environment and are making the spaceship Earth an inviable place for human life.[10]

Not so enthusiastic in his opinions, but also with a positive regard to the role performed by the mass media in

the field of environmental education, James McEvoy III explains the increasing of public concern to environmental issues: "First, and very probably most important, has been the increase of media attention to problems of smog, water pollution, population growth, and so forth."[11] But McEvoy III also offers two other explanations for the fact: the increase in Americans' personal exposure to their natural environment and the clear deterioration of many aspects of the environment itself.[12]

Another rationale to explain the importance of mass media in the field of environmental education is offered by Keith R. Stamm. His point of departure is that the environmental problem is in large part social or collective in nature: "Individuals must do something, all right, but to be effective they must achieve collective action based upon an exchange of thought with other individuals."[13]

And Stamm concludes: "It is in this context that communication emerges as an important aspect of the environmental crisis. Joint recognition of problems and consideration of alternative courses of action are not possible without communication."[14]

David Rubin and David P. Sachs, authors of the most extensive work on mass media and the environment, are more cautious when they assess media performance on the subject. Although they compare environment with the communist menace in the 50s and the black issue in the 60s as the great American subject for the 70s, they point out: "It is yet too

early to assess completely the impact of press performance on the environmental protection movement . . . Political events since 1969 show that the news media have already played an important part in educating the public to environmental problems."[15]

Although mass communication research does not justify many of the enthusiastic statements seen above, it does offer some hope for those who believe mass media have an important contribution to give to the solution of environmental problems. Throughout the first part of this work this will be shown in details, but some broad ideas can be given now.

Maybe the most important role performed by the mass media is the one of focusing the subjects that will be of public domain. As Theodore White said: "The power of the press in America is a primordial one. It sets the agenda of public discussion; and this sweeping political power is unrestrained by any law. It determines what people will talk and think about."[16]

Revising all the mass communication research available until 1972, in a work prepared for UNESCO, Y. V. Lakshmana Rao also recognized the role described by White, but he went further. Though making clear that "mass communication ordinarily does not provide the single cause of audience effects but rather functions among and through a nexus of mediating factors and influences,"[17] Rao says

that some broad generalizations can safely be made about all the media:

1. the media have the power to focus attention on issues, on events and on personalities and thus to direct a great deal of the discussion within society
2. the media have the power to confer status, both on the communicator and on the personalities the communicator brings us for attention
3. face-to-face persuasion is more effective than persuasion through mass media
4. a combination of media communication and face-to-face communication is likely to be more effective than either alone[18]

Wilbur Schramm showed what mass media can do by themselves and what they can help to do.[19] Schramm says that in the field of information, the media can by themselves widen horizons, focus attention, and raise aspirations; in the field of decision process, media can help changing attitudes and values or reinforcing them, feeding interpersonal channels, conferring status, enforcing social norms, and forming tastes; in the field of teaching skills, media can help every kind of teaching.

Thus, if mass media will not be the "magic" solution for environmental problems, there is no doubt that they can help a great deal to overcome them. Using adequately the research already available, particularly by avoiding tactics

that have been proved as ineffective, will improve the chances for an efficient utilization of media in the developing of environmental education.

For the communication practicer, it seems to be a good idea to pay attention to the warning made by Robert Buchout to the psychologists:

> . . . The urgent problem then for the psychologist concerning the immediate future is how we can help to change rather than merely to measure attitudes and behaviors that are potentially dangerous to mankind. In this endeavor, research and social action are intertwined. For example, let us assume that a social psychologist designs a persuasion scheme to ascertain the advantage of high fear versus low fear as a motivating agent for attitude change. I would urge that he not remain content with demonstrating this as a theoretically significant point, but that he actually set out and produce changes in personal awareness and action that would help to cut down on air pollution. In short, the criterion for success should be results.[20]

This criterion should be used not only by psychologists, but rather by everyone interested in actually helping to solve man's most important problem, the one of surviving with decency in Earth. This, of ccurse, includes communicators and those who deal with communication research.

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CHAPTER II

THE NEWS

Science News

News referring to environmental subjects may be considered as a kind of science news, despite the fact that it is often also related to political and economic considerations. Although more and more people tend to regard the environmental issue as a political, economic or, further, philosophical one, the environment news still has to be based on a good scientific background to be credible. For that, before analyzing specifically the environment news, let us take a look at the broader field of science news. Many of the lessons learned from the larger research available in this area may be very useful to those who deal with environment news, especially those which refer to writing style.

Media's Importance

Many authors have showed the importance of mass media in the process of delivering scientific information to the public. Serena Wade and Wilbur Schramm pointed out:

> Only in the most specialized areas is it possible to think of a single source for any kind of knowledge. We learn in school, and we learn from experience. We learn from the mass media and from other people. All the chief sources, in their own way, cover all the broad areas of knowledge. Therefore, when we talk of the sources of public knowledge, we must necessarily talk not about which source is used, but rather about which source is more likely to be used, or used more often or preferred.[1]

Despite all this caution, and though lamenting that there is no national data on interpersonal communication and adult education as sources of adult knowledge in the fields of public affairs, science and health (the objects of their study), Wade and Schramm were able to state that

> . . . we have reason to believe that the mass media may be the chief sources of such knowledge after the school years, still they represent only part of the pattern of adult information-seeking.[2]

(According to Lingwood, "information-seeking may be conceptualized as any exposure to information, though more often the term implies an active search on the part of the seeker, as compared with passive reception of stimuli."[3])

In another work, Schramm stated more positively that "mass media use is the second predictor of scientific information; after the school years, most of the increment of science knowledge comes from the media."[4]

Other authors also corroborate the assumption that the mass media are the chief source of science information for adult people. Rubin and Sachs, for instance, declare that "the usual interface between scientific discovery and the public is the mass media," although pointing out that the scientific advances have been happening so fast that it

is difficult for the average citizen to fully perceive the significance of the changes.[5] David Lingwood seems to be more moderate concerning the importance of mass media in the diffusion of scientific knowledge. Yet, he says: "Much of the information we get about the physical environment comes not from formal courses in environmental education, but from the mass media, from our friends, and from our own observations."[6]

One factor has been improving the responsibility held by the mass media concerning the scientific, and particularly environmental news: the urgence for solutions to some of the problems involving science and environment. Furthermore, the changes happen so often and so fast that it is impossible for the educational system to cope adequately with the task of maintaining people constantly up to date in their fields of specialization. For a person to do that in the educational system, he or she would have to stay in the school the whole life.

Even so, it is necessary to keep informed and problems need solutions that cannot wait for a formal education process, which is usually slow. For Rubin and Sachs, this "puts the burden of educating people about scientific subjects upon the mass media."[7]

Cecile Trop and Leslie L. Roos, Jr. also support that view:

> Current public concern and commitment may not be enough to insure a sensitive legislative response to environmental needs. Concern for the environment

> must be internalized into personal and national value systems; such a process is time-consuming and at least partially dependent upon formal education. Because more immediate action is necessary, measures must be taken to institutionalize the government's responsibility for the health of the environment while the political momentum still exists.[8]

The way for doing that, it is clear, is through public movement spread by mass media. Although Trop and Roos, Jr. say it is difficult to know whether media coverage causes political action or vice-versa, or still whether public concern causes both the latter or vice-versa, they agree that all the available tools must be used to take advantage of the "political momentum."[9]

Therefore, the public reliance on the mass media for scientific knowledge, which seems to have been existing at least since the Sputnik launching[10] was fastened and enlarged with the advent of the environmental concern, as the need for solutions urge fast action and decisions from the public.

Patterns of Media Usage

The reason why there has been such reliance is logic: the mass media are the most accessible way for the public to get that kind of information. As people need information to make their minds about problems affecting them (and scientific and environmental issues for sure affect almost all the public, if not all), they tend to look for it through the easiest way.

Hillier Krieghbaum says that "what science news consumers want from the mass media is a bit of the essence of the experiment, not its detailed nuts and bolts."[11] People want just to reduce their ignorance on the subjects in order to make up their minds. Answering to the question of how much does the non-scientist public need to know, Krieghbaum offers this suggestion:

> . . . one tentative reply would be: enough to keep informed on a vital segment of contemporary culture and thus participate meaningfully in public decisions that are a part of the domestic process.[12]

The same way it is not demanded from an elector to be a political scientist, it must not be demanded from the simple citizen to be a fully understander of the scientific process. Furthermore, if the mass media were asked to transform a simple citizen into a deep knower of sciences, they probably would not be able to carry out such mission, as Krieghbaum suggests:

> The mass media can arouse public awareness in a relatively short period of time . . . But a corollary indicates that it is difficult, if not impossible, to develop deep, abstract concepts within such a limited time through the use of the conventional spot news coverage and features . . . The mass media, however, can create awareness and stimulate those who wish to learn more.[13]

What segments of the audience are more likely to be the "consumers" of science news? In their study, Wade and Schramm concluded that education is a powerful predictor of mass media use.[14] Kreighbaum states that

> the typical science and medical news "consumer" is likely to be younger rather than older; his family income is probably well above average; he probably

> studied science in high school and, if he went to college, took additional courses. Among those attracted to medical news, women are more likely to predominate than men, and, among those attracted to non-medical science, there are probably more men than women.[15]

The picture drawn by Krieghbaum, as it will be seen later, fits very well with that drawn by more recent surveys about who is the consumer of environmental news, what helps showing how related are the findings about science news with the problems concerning the environmental news.

About which medium is more likely to be used by the science news reader, Wade and Schramm made clear that newspapers and magazines are the chief sources. Although their data may be considered outdated (1957 and 1958), there seems to be no recent evidence to contradict them. Wade and Schramm stated: "When public knowledge derives directly from events that are readily available for people to view, then television is more important as a source; when they must be reported or interpreted, then the advantage is with the printed media."[16]

Of course, this is the case of environmental news. So, it is probable that the most of the public will rely more on newspapers and magazines than on radio, television, or film to be informed about it. However, Wade and Schramm also discovered that among the poor and less educated people, the reliance is larger on broadcasting than on printed media.[17] If environmental news is to have a universal public, so, it cannot ignore this fact.

The usage patterns found by Wade and Schramm also indicate that those people who rely more on newspapers and magazines are the ones who actually know more about science and health issues.[18]

Criticism of Media

But the media have not been free of criticism in the way they deal with science news. The scientists themselves are those who criticize media the most. Overemphasis, prematurity, inaccuracy, and sensationalism are the faults which scientists usually impute to the media. Journalists themselves charge media performance with other kind of faults: excess of reliance on scientific sources of information, inability to exercise the "watchdog role," science apologism and style flaws.

David Warren Burkett studied the problems of overemphasis and prematurity and reached to the conclusion that blowing a story up beyond its proportion in the eyes of the profession and premature disclosure of promising results raise too many false hopes among the public and discredit the media among the scientists.[19]

The scientists' perception of accuracy of science coverage has been studied by some authors, among them James Tankard, Jr. and Michael Ryan, who conducted a survey in 1974. They said:

> This study focused on scientists' perceptions of the accuracy of science news articles. This

> perception is subject to distortion, as is any perception of an individual witness. Furthermore, it was not possible in the study to question the reporters who wrote the articles, some of whom might have had good reasons for doing something that a scientists categorized as an error. Nevertheless, the scientist whose work is being described in an article stands at a unique vantage point to assess the accuracy of the article.[20]

The error rate found in Tankard, Jr. and Ryan's study was much higher than earlier studies indicated for regular coverage, perhaps because of the greater difficulty and complexity of science news or because the scientists respondents were given a longer check list of possible error types to consider.[21]

But another part of the study indicated that scientists use to regard media coverage with suspicion:

> The attitude items indicated strong criticism by the scientists of the accuracy of science news reporting in general. Large majorities of the sample indicated that headlines on science stories are misleading (82.4%) and that information crucial to the understanding of research results often is omitted from news stories (76.3%).[22]

The authors suggested as a probable solution for the problem that science writers should allow scientists to read the articles before printing, but there seems to be a spread rejection to this idea among press-men because of the enlargement of the dependence on scientists' information and because of the implications of censorship involved.[23]

The suspicion of scientists regarding the media seemed to be confirmed by a survey carried out by Timothy O'Keef, who investigated a group of North Carolina doctors toward the presentation of medical news in the mass media

and found that only 24 percent of them considered the mass media to be important sources of medical information for themselves.[24]

Despite this attitude from scientists, there are those who believe that the problem with science news coverage is the excess of praising to the scientists. Reviewing science writing, John Lear, for instance blamed science writers of treating scientists as "always right-men" and acting as apologists for science, never discussing and never trying to see errors.[25]

Another problem, the sensationalism, may have its origins in the scientist source along with the journalist, as indicated by Dr. Philip Abelsom, from Carnegie Institution:

> . . . with distressing frequency scientist-operators are able to flin-flan the science writers with news stories which excite the imagination but have no solid technical bases. Local editors are especially susceptible to these worthless baubles, which they run in preference to less exciting items of solid merit.[26]

The source of most of the faults in science news coverage may be the very difference which exists between the scientific and the journalistic methods. While science progress is slow and conclusive statements are scarce, journalism needs a faster process and more definitive declarations in order to help public making up its mind. The same kind of difference can be seen between science and politics. For instance, during hearings on violence on television, held by the U.S. Senate, there were constant

demands from Senator John Pastore to the scientists being questioned for them to speak "plain language" or to state more definitely whether violence on TV was or was not harmful.[27]

Another good explanation for the differences between scientists and journalists was offered by Dennis Flanagan:

> Scientific progress is not packaged obviously in daily events, in spite of such artificial newspegs as the publication of a paper or presentation at a scientific meeting . . . The journalist of science can only operate by thinking in terms of broad themes, and yet he is obliged to cut up these themes into little pieces to fit the cannon of news . . . It would be much better if the journalist used his knowledge of the important themes in science to convey the theme itself, not its disconnected parts.[28]

Flanaggan's suggestion is that the background and the connections of each story, as well as the men who worked for a given story, should be put in the story.[29] Of course, he is ignoring that one of the greatest barriers any science news writer has to overcome is the space limitation. Because of that, the advice of Dr. James A. Shannon, of the National Institute of Health seems more appropriate:

> It is usually the newspeg that causes the distorted headline and the rewrite job that really does damage to science. I would like to comment specifically in relation to the problem of context . . . The discovery or advance can be presented as a step in a series of advances that have gone before and will continue. This context can be covered in a few lines without going into the detail of the total background.[30]

Many of the criticisms with which media have been charged are indeed procedent. But there seems to be an

unawareness that it is not the media's function to form scientists among the public, but only furnish the vital information to enable it to make up its mind and take conscious decisions about the scientific problems that affect it.

Questions of Style

For sure, reducing complex scientific arguments to lay language is not an easy task. Doing that properly is one of the most important points in the science news writer's work. Furthermore, the style he uses to carry out this task may have considerable influence in the effects the news is going to cause on the audience, as it will be seen below.

The problem of language in the field of science news was considered by David Warren Burkett:

> One barrier to understanding and popularization (of science news) is the language of science. This specialized language of precise technical terms laced with jargon is not spoken by the layman. Often scientists in one field cannot understand the language of another. Yet, some scientists object to "popularizing" on the grounds that subjects cannot be clearly discussed outside the language of science.[31]

At least one study has showed that a number of textual variables are related to differential audience effects of science writing.[32] Ray Funkhouser and Nathan Maccoby made a group of students to read ten short articles on enzymology. After that, the students were tested in order to assess information gain, enjoyment, attitude

change and tendency to seek further information about the topic. It was found that fewer science words, more activity, use of examples, and mention of practical applications seemed to contribute to more favorable audience reactions to science writing.[33] Though Funkhouser and Maccoby did not consider that study conclusive, they said the findings "seemed intuitively valid, reasonably substantiated and consistent."[34] To give them a worthy test, another study was designed and carried out.

After testing 475 students at a junior college, 447 at an university and 272 professional scientists, Funkhouser and Maccoby offered the following suggestions for effective science writing:

> --think of the test you would give your readers to see how well they learned the material you want to convey, then organize your material so that if they learned it all they would score 100%;
> --use examples, analogies, general rules and exceptions to general rules wherever these devices are appropriate to the material you are trying to communicate;
> --be explicit; state your facts as straightforwardly as possible;
> --use as little scientific terminology as you can get away with short of compromising the material you are presenting;
> --use shorter, simpler sentences and shorter, simpler words;
> --introduce, interparse and end your material with something other than "hard science";
> --say something about the practical applications of the topic you are covering.
> These rules apply to general audience comprised of relatively well-educated non-scientists.[35]

In a similar study, Wilbur Schramm listed the techniques in reporting science which can improve the number of readers of the story:

(a) if you can put something in story form, it will be read by more people;
(b) if you can make it apply to the reader, more will read it;
(c) if you can stress the sensational elements in it . . . or the human interest elements, it will be read by more people;
(d) if you can personalize it, it will be more read.[36]

Although one can doubt whether to reach the most people must be one of the main targets of science writing, it is reasonable to hope that the information is conveyed to a large audience. Of course, the tactics used to gain more public to the science news should not make the writer incur into the faults priorly described, such as inaccuracy and sensationalism.

Schramm also talks about some negative indicators as the fact that some new information creates such anxiety that readers will reject it; there is a point beyond which the arousal of fear or unease will result, not in more attention, but in rejection.[37] This point should be particularly stressed to environmental news writers because news concerning environmental problems are often alarmist and fearful. Some studies have dealt specifically with the subject of the effectiveness of fear as a communication tool and could be helpful to the science news writer.[38]

Another style problem missed by the cited studies is the one of quantification. Quantification is the numerical data presented in a given story. In scientific writing, it is very common the utilization of great deal

of numerical data. But very few studies have investigated its effects upon the audience.

Donohue, Tichenor and Olien found that understanding of textual material is positively related to quantification at the lower ranges of a curvilinear relationship, but negatively at the upper ranges.[39] Witt found that quantification in textual material increased reading time but failed to decrease recall significantly.[40]

In a study specifically aimed at scientific writing, Witt hypothesized that quantification would adversely affect predispositions about solving problems posed in text, since issues embedded in difficult text may appear more difficult because of the context in which they occur.[41] To test the hypothesis, a scientific article about air pollution was revised to consist of ten sentences totaling two hundred words. In a second version, twelve appropriate numbers were substituted for twelve descriptive mcdifiers that lent themselves to quantification (e.g., atmosphere contains about 80% nitrogen, vs . . . a high proportion of nitrogen). Both articles were otherwise identical.

Fifty university students read one article, fifty read the other. Both groups, after reading, were presented with a list of thirty words: ten unfavorable, ten favorable and ten neutral to the likelihood of solving the problems posed in the article. Predisposition favorable to finding solutions was measured by the frequency of favorable words selected.

Results showed that predisposition significantly decreased in favorability after exposure to quantification, confirming the hypothesis.[42]

Another study, by Ray Funkhouser and Nathan Maccoby, also found empirical support for some hypotheses concerning the style of scientific writing and its effects on audience. They discovered that desirable reader effects such as information gain, enjoyment and attitude favorability are influenced by several specific, manipulable textual variables; that the three above mentioned audience effects are compatible rather than mutually exclusive and that "simple" science writing is less likely to alienate a reader who already is strongly interested in science than is "difficult" science writing likely to alienate a disinterested reader.[43]

However, despite all this evidence that style characteristics do have influence on audience effects, there are authors, for whom they are not so important. For intance, James E. Grunig, who says that

> style of a science story is less important than whether the content is relevant to the perceived situation of the reader. Thus a science writer should be most concerned with story selection if he hopes to achieve understanding of science . . . The findings (of his study) also show the difficulty of communicating with people who do not perceive a problem to which the scientific topic relates . . . They do not stop to think about the information even when they are forced to read it. And they would not seek it out were they not constrained to do so.[44]

Yet, Grunig suggests that some style tools, such as parables and analogies, can be used to break that indifference, but concludes that science can be communicated to the public, "but only to a public which perceives its relevance."[45]

Kenneth Johnson also supports the idea that significance is a more important value than style characteristics for the science news reader. He surveyed groups of editors, scientists, science-writers, readers of science news and non-readers, to find out what factors were primordial for each of these groups in their evaluation of science news.

He discovered that editors evaluated science news primarily on the basis of color and excitement, with readability and accuracy as secondary factors. The evaluations of the other four groups in the "science communication chain," on the other hand, were related to such aspects as accuracy and significance. Readability and excitement were secondary factors for these groups. These findings suggest that editors put far more emphasis on color and excitement than their readers would demand.[46]

Editor's Policies

This finding brings the subject of editor's policies which seem to be one of the most important constraints to the science writer's attempt to carry out their intentions of public guidance.

Rubin and Sachs, when listing the problems the science writer has to fight against, point out:

> . . . Editors who still are trying to boost circulation through the Hearst approach to journalism often find scientific matters too bland to conform to a bold-face, banner headline format. The editor who maintains this attitude is likely to assign few scientific articles, and those he does assign often may be distorted through an attempt at sensationalism.[47]

They also show that the "Continuing Study of Newspaper Reading" makes clear that, at least until the early 60s, the reading public has a comparatively active interest in science news although editors were inclined to downplay its importance. Though readers revealed the science and invention news ranked twelfth in interest, newspapers' items about the subject were the fortieth in a list of news categories. Rubin and Sachs say that "although we do not have comparable research data for the past twenty years, it seems likely that reader interest in science news has remained high and the gap between interest and the amount of information presented has narrowed."[48]

However, the editors' attitude toward science news does not seem to have changed a lot. Altroph, Greig and Stuckey interviewed 104 media managers in Kansas in 1973 and found out that "when compared with other news issues, managers view the environment as relatively unnewsworthy."[49] Of course, this is not sufficient to support a conclusive statement, but serves as an indication that things are not so different now as they were twenty years ago. Despite

that, there is no doubt that there has been an increase in the amount of scientific (and especially environmental) news printed and broadcast through mass media, as it will be shown below.

Environment News

Many of the conclusions reached by those who have studied science news can be applied to environment news, as it was said before. However, though the material available is not large yet, there are some studies dealing specifically with the subject of environment news, with interesting findings and conclusions which will be shown in this section.

Environment News Explosion

There seems to be a consensus among communication researchers that "the news media have tremendous potential for directing our attention. We tend to assume that the events they cover are important, if only because they are reported in the media."[50]

Wilbur Schramm says that

> a reasonable hypothesis is that the most powerful effect of the mass media on public knowledge . . . is the ability of the media to focus public attention on certain problems, persons, or issues at a given time . . . For example, the developments during the past years in the field of ecology could hardly have taken place unless the mass media had raised ecology to a level of public attention and kept reporting on it day after day.[51]

Many other communication authors recognize this characteristic in the mass media:[52] the capacity of "legitimizing selected policies, persons and groups."[53]

This capacity seems to have been exercised by the media on the environmental question for the last seven years. Rubin and Sachs classify the year of 1969 as "the magic year of the environmental crisis,"[54] the year in which the environmental information explosion began in the U.S. For them, the public mood in 1969 was receptive to this explosion:

> . . . millions of newly affluent Americans had fled metropolitan centers . . . to stake out a future in garden suburbs. To their dismay they found that pollution and congestion followed them. They formed the nucleous of the audience eager for information about polluters.[55]

That there has been an explosion in information about the environment is an indisputable fact. But the reasons why it happened are not so clear. Some, as Schramm seems to indicate in the quotation above, believe the media were the main agent. But Peter Sandman believes that media only answered to the public's desire:

> The responsiveness of the media to audience interest is a critical factor in understanding news coverage of the environment, or of any other issue. When Bay Area editors and environmental reporters were asked to account for their increased attention to the environment, 54% offered "public demand" as an explanation. By contrast, only 30% referred to pollution itself, 23% cited speeches and other newsworthy events and 15% claimed media leadership.[56]

Sandman's findings, however, may not be so impressive if it is remembered that journalists praise as a very

desirable quality the fact that they follow the public demand. Journalists themselves have a trend to make their role as less important than it really is, for fear of appearing as manipulators of public opinion.

Yet, what Sandman says is worth to be considered. In consequence of what he sees as the responsiveness of the media to public demand, Sandman implies two results: a geographical one (where there is more concern, there will be more news about environment) and a temporal one (when the novelty wears off, coverage will decrease).[57]

And he concludes:

> We owe the current environmental information explosion to the public, and we can expect little further increase in environmental news until there is a further increase in public concern. In the interim, agitation for more environmental coverage is probably fruitless. It seems far more practical to take as given the quantity of environmental coverage, and work for an improvement in its quality.[58]

How this improvement can be achieved will be the subject of the next sections.

The Home-Team Problem

One of the problems media seem very likely to be involved with when dealing with environmental news is the one called as "home-team" by John L. Hulteng.[59] The "home-team" philosophy means that the local media do not feel like reporting bad news about their city, if the news is believed to be a potential source of economic damages to the city. In his book, Hulteng quotes an editor from a small

New England town who said: "We don't go looking for trouble . . . I take my living out of this city and I think it's my job to do everything I can for it."[60] Hulteng cites many examples in the United States, in which editors have failed in picturing reality in its full image, in order to defend their communities, and warns: "Whatever the motive, however, if the end result is a false picture of reality, the journalistic ethic is not being properly served."[61]

Rubin and Sachs studied a specific case in which environment news was involved, in San Jose, California, and concluded that media owners boost their own communities and, in the process, assume the characteristics of the local chamber of commerce members.[62] For them, this is another subtle manner in which newspaper policy can undercut the educational efforts of a science or environment writer:

> It is very easy for some newspaper executives to develop policies that make the paper itself an instrument of the growth establishment, presenting to its readers a biased perspective on a wide range of scientific and environmental issues, from airport and highway development to water supply projects.[63]

However, things do not have to be necessarily like that. Rubin and Sachs offer a way through which media could perform their role without causing damages to their communities:

> The metropolitan newspaper's commitment to the health and vitality of the local economy is appropriate and understandable. Without a healthy economy, public and private expenditure for environmental improvement . . . is crippled. However, the most common and accepted wisdom has held that a healthy economy is synonymous with a rapid growth economy. . .

> However, the environmental movement has begun to underline the massive diseconomies-regional in scope-represented by the failure to include air, noise, water pollution, and the biotic and aesthetic damage in account . . . Newspaper managements must place its downtown focus in perspective. It must recognize the newspaper's economic interest in the appropriate regional perspective, recognizing that regional planning rather than municipal growth competition offers the best possibility for internalizing what economists refer to as "external diseconomies."[64]

The "home-team" problem may be a universal one. As will be seen in the second part of this work, some symptoms of this problem could be detected in Santos, Brazil, during an environmental crisis, when the local newspapers (as well as the mayor, the businessmen and almost the whole city) preferred to ignore the hazards and denounce them as fictitious, at least during a certain period of time. Only after there was complete scientific and practical evidence that there was an ecological menace, the papers began to provide their readers with a full coverage of the subject and, to be fair, carried out their task with impartiality.

The Afghanistanism Problem

The "home-team" philosophy may be the reason for another problem that seems to affect media performance in environment news: the "afghanistanism." The first authors to use this term to describe media's coverage on environmental subjects were Steven E. Hungerford and James B. Lemert.[65]

They investigated twenty Oregon daily newspapers and found that when environmental items were situated in Oregon,

the newspapers would tend to concern locations outside the newspaper's own region. Environmental issues were more likely than other items to be about locations outside each newspaper's principal circulation area. Their explanation for the findings was that

> the long-term interests of newspaper audiences are served best by the kind of near-afghanistanism presumably described by our results. Since newspaper's environmental content generally reflected their own region's concerns, the argument could be made that little extra good and much extra harm would be achieved by focusing on local problems.[66]

The findings in Oregon were supported by other study, this one carried out in North Carolina, by Arvin W. Murch. This study also shows the effects of "afghanistanism" on the audience. After surveying 205 people in Durham, North Carolina, Murch found that 74 percent of the sample reported that pollution is a national serious problem, but only 13 percent said it was a local serious problem, despite the fact that objective data indicated that Durham shares most of the nation's environmental problems.[67]

The acknowledgment of pollution at other geographical levels was consistent with this finding. Overall, the inclination to identify pollution as a significant problem "steadily increased as the reference moved away from the respondent's immediate surroundings."[68] Trying to explain his findings, Murch pointed out:

> One reason for this pattern may be that concern over environmental pollution has been heavily influenced,

> if not generated, by the mass media, and these media have commonly focused on the broader aspects of the problem. This explanation is supported by the fact that the media clearly dominated as sources of information about environmental pollution, and among these, television was most often cited, while magazines were also commonly mentioned. Personal sources, such as friends, ranked further down the list . . . local newspapers also tend to concentrate on national rather than local environmental problems. During the period of the study, 1/3 of the material devoted to environment were focused on national problems and 50% on national and global problems. Less than 10% dealt with local problems . . . It seems reasonable to suggest, then, that the media have helped to produce the tendency to view pollution as a rather general problem, external to one's own community.[69]

However, Murch also suggests a psychological reason to justify his findings: maybe those people interviewed were just being reluctant to acknowledge the problem or already used to it so that they did not note it any more.[70]

National television networks and national magazines, for sure cannot spend their space and time with problems that are of specific concern to tiny areas or towns. But the local newspapers, radio, and TV stations could avoid helping the creation of the "afghanistanism" problem, by improving their local coverage of local environmental problems and relating them to the personal interests of their public.

The Syndrome of Well Informed Futility

It has been long noted by many researchers in communication and sociology that the mass media can produce a sense of impotence on their audience. As far as 1948,

Bernard Berelson already said that media may overwhelm at least a portion of the audience and promote a sense of apathy "simply through the presentation of the magnitude, the diversity and the complexity of an issue."[71]

Even before that, Walter Lippman had talked about the "pseudo-environment."[72] Lately, Alberta Siegel has also pointed out the possibility of people as audience of mass media make confusions between real and fictitious facts.[73] David Berlo also warned about an "inundation of our lives with information and an increase in feelings of alienation from the system."[74] Other authors could still be listed.

But G. D. Wiebe was one of the first to link that concern with the specific fact of environment coverage. He said that

> in the U.S., one result of interactions between people and mass media is a reduction in the effectiveness of man's relationship with his environment . . . The success of the mass media in the dissemination of news and information is beyond dispute. But social arrangements for channeling the energies of informed citizens back into social action have not kept pace. Rank and file members of the audiences are afflicted with a malady that can be synopsized as knowing our business but not tending to it.[75]

Wiebe calls that "the syndrome of well-informed futility" that can be defined as "a high level of knowledge drawn from the media, exclusion from the becoming of important events and the weakening of the individual's confidence in his own ability to cope with his environment."[76]

For him, this tendency is particularly notable in the problems of environmental degradation:

> . . . in general, people do not perceive the environmental problems as in their own scenes. Or the problems are in another place or they cannot be solved by the common individual . . . his (man's) feeling of futility . . . tends also to debilitate his feelings of responsibility and competence in local affairs . . . while children clean up a square block, a corporation pollutes a square mile.[77]

Wiebe's conclusions seem to be confirmed by some studies which will be examined in the part of this work which deals with persuasion. The results of those studies show that there may be an inverse relationship between amount of knowledge about the environmental problems held by an individual and his disposition to work toward solutions for those problems. It is exactly "the somnambulistic way in which we know trouble is brewing, can quote statistics on the accumulating danger and do nothing about it"[78] described by Wiebe.

Although not speaking specifically about the environment problem, David Riesman has also supported the rationale formulated by Wiebe, when he said that

> broadcasting has reduced the distance in space and time which once could buffer individuals so as to delay the impact of news and its interpretation. And such instantaneous knowledge in the absence of instantaneous remedy may perhaps have increased our sense of helplessness, although it is doubtful whether we are in fact more helpless than when we knew less of what was going on, or learned of it more slowly.[79]

The task that waits for media in this problem seems clear and is, at some extent, intertwined with those needed to overcome the two prior problems. It was thus defined by Wiebe:

> Activating the perception of a social problem as being in one's own scene is a subtle and basic challenge. Emphasizing the local manifestation of the problem casting it in a familiar setting, presenting it through a local medium: these considerations are probably important.[80]

The Watchdog Role

Environmental matters are often involved with human health problems, political and economic implications, besides their usual scientific aspect. This characteristic makes them still more complex. Their complexity is one of the reasons why it is so difficult for the reporter assigned with the task of covering environmental subjects to perform properly the traditional watchdog role of press.

Other reasons may be cited: lack of concrete news pegs, long gestation period of news, difficulty to get access to some sources (as the business community, for instance), relying on official (governmental and scientific) sources, lack of reporter's deep knowledge on the matter, among some more.

Science and environment reporters have been often blamed for not exercising the watchdog role. But the situation may be changing, as shown by a study developed by Bruce J. Cole. Cole says that through the environmental movement, it would appear that scientists have been more heavily involved in social controversies than ever.[81]

According to Donohue, Tichenor and Olien,[82] the more differentiated and pluralistic a social system is, the

more likely mass media will perform their traditional watchdog role. If it is true, Cole concludes that "as the scientific community has grown in recent decades, becoming more diverse, and in certain respects, more pluralistic, the mass media have performed the watchdog function to a greater degree," in what concerns science, and particularly, environment news.[83]

To test his hypothesis, Cole performed a content analysis of all science news stories in a sample of 252 editions of four major dailies from the years of 1951, 1961, and 1971. He concluded that "it would appear that the four sampled newspapers have performed the watchdog function in reporting science news more in 1971 than in 1961 or 1951."[84]

Although this optimistic conclusion, Cole's study also showed that "science writers may be less likely to report the controversies of science than the general staff reporters," maybe because of these reasons: affiliation of reporters with scientific groups and the fact that when the science story enters the political realm, it is assigned to the general staff (what Cole thinks is a nocive habit for the science writer would be more likely to better grasp of a controversy and report it more accurately and understandably to the public).[85]

Anyway, even if the media have indeed increased their exercising of the watchdog role in scientific and environmental matters, as Cole suggests, some advices made by Rubin and Sachs are still useful:

> In acting as watchdog of government and business, the news media must cease to merely react to events. They should be particularly alert to instances where laws are being violated, where planning recommendations or policies are being ignored for private, and where public opinion on environmental matters is being flouted. In the absence of accepted standards on what is desirable or undesirable environmental change, on occasion the newsman must trust his own instincts on the wisdom of projects with far-reaching environmental effects. Finally, the news media should attempt to synthetize for the public the solutions to environmental problems put forth by government, citizen groups, business, and the academic and scientific communities.[86]

The Manipulation Problem

Many of the solutions here presented in order to improve media performance with the objective of helping the task of environmental education will probably conflict with newsmen's traditional assumption that objectivity must be a fundamental rule for them.

Some newsmen could object that the suggestions here shown, if carried out, will constitute a case of manipulation of the audience. Some of the authors who have been writing about mass media and environment are radical and unorthodox about that, as Peter Sandman, for instance:

> Environmental educators can easily sympathize with the journalist's desire to avoid manipulating his or her audience; we share that desire to a very great extent. But if the mass media are to be effective agents of environmental education, they (and we) must come to grips with the gaping hole in the rationalistic approach to persuasion.[87]

However, the goal of objectivity is not any more a universal value for journalists. At least since the advent

of "the new journalism movement," in the early 60s, more and more newsmen in America and other countries, have become conscious that it is probably impossible for a journalist to be completely objective in any issue and that there is nothing unethical in practicing an "advocative journalism."[88] Of course, to be an advocate of a cause does not mean to distort reality but just to let clear what the journalist's position on the issue is.

Not only those who support the assumptions of "the new journalism" share this viewpoint. Also those who uphold the so-called "theory of social responsibility of the press" think newsmen should always act purposely aiming at what is considered the "common good," instead of just reacting to events.[89]

Under this perspective, Sandman's suggestions do not seem harmful in anyway. He says that

> it is appropriate to ask whether the mass media can choose their information with more of an eye toward its relationship to attitude and behavior.[90]

In the specific field of environmental news, Sandman says that mass media should look for news that could give to the public: more principles of ecology, more ways through which society and individuals can cope with and eventually reverse environmental deterioration, more "problems-in-the-making" which have not yet become serious environmental crisis (instead of just reacting to crises), and more investigative reporting to show to people who is morally and practically responsible for environmental degradation.[91]

Sandman does not believe the mass media have been giving to their public this kind of information and, therefore, they have failed up to now to "stimulate a more wholesome attitude toward environment, an interest in seeking out more advanced sources of environmental information and a commitment to participate in the solution of environmental problems."[92]

The Environmental Reporters

It seems clear that a primordial role in the process of the environmental coverage by the media is the one performed by those who seek for information and write the news. Who is the environmental reporter? Is he prepared to carry out his task properly?

There are very few studies about this subject. Many newspapers do not have specialized reporters in this field yet and many of the reporters who consider themselves as specialists are not full time assigned to cover environmental matters. The same can be said about radio and television stations.

The most extensive work about the environmental reporter in the United States was developed by William Witt.[93] He made a national survey in 1972-1973, having sent ninety-five questionnaires to environmental reporters all over the country. Fifty-five of them were used in the study (coming from twenty-six states). Based on them, Witt concluded that the typical environmental reporter is a

journalism graduate and experienced newsman, but has minimal background in related sciences. He was not fully recognized as a specialist reporter, spending only about half of the time covering the environment and the rest on general assignment. He got most of his news from conservation clubs and organizations, and from governmental sources, as well as business and industry sources. He was bothered, probably not critically, by pressures from business, industry, and government. He felt strongly that environmental reporting as a speciality lacked focus and direction, and wondered whether public concern for environmental quality was merely a passing fad, though he believed it was not. He considered follow-up particularly important and that reporting should deal more with solution rather than only with problems. He believed that he should spend more time on his beat and that there should be more and better educated environmental reporters in action.[94]

Surveying only Californian environmental reporters, Rubin and Sachs reached to similar conclusions. In their sample, it was showed that the environmental reporters were not prepared to act this role and that only a few had a scientific background. Most of them came from governmental beats rather than science beats. The list of pressures that hinder them in their work included: advertiser pressure, management policy, unavailability of information, their distrust on conservationist sources, dependence on hard news pegs, lack of expertise, time pressures, space

pressures, money pressures, parochialism and their own definition of environmental news.[95]

The finding that the environmental reporter does not have enough scientific background revives an old debate about the need for organizing science education for the journalist. A recent study by Michael Ryan and Sharon L. Dunwoody indicates that today's science writers are much better educated than those of 1940, but that English and Journalism courses are still preferred by science writers rather than science courses.[96]

Thus, the controversy referred by David Burkett is still alive. Some people believe it is necessary an education program heavily oriented toward science courses for journalists who are going to work in the science beat. Others think that it is impossible to know what background is required to make a good science writer. After showing the both sides of the question,[97] Burkett concludes that at least some background knowledge is essential and that this knowledge may come from personal contact with scientists:

> . . . out of a reporter's background comes swift recognition of new stirrings in old research and the solution of classical problems . . . this background, from reading and interviewing, enables a reporter to add historical perspective to his stories about current research.[98]

Possible Improvements

Despite all the citicism that can be made against mass media performance in the field of environmental news, no one can deny that some achievements (and not little ones) have already been made. Rubin and Sachs say that "on a national basis, at least, the news media have achieved the first goal: the public has been made aware of the general scope and consequences of environmental deterioration."[99] Murch states that "the fact that most people now believe that pollution is a significant problem suggests that the media have already effectively dramatized the problem."[100] The Environmental Protection Agency points out that "the public already knows there are environmental problems."[101]

However, even in this matter there are some doubts whether information about environmental problems is completely spread throughout society, particularly in some special subjects. For instance, a study performed by the University of Wisconsin Institute for Environmental Studies about Wisconsin's Point Beach Nuclear Power Plant showed that "the majority of citizens were not informed on the environmental consequences of power production," but rather, "recognized the nuclear plant as an economic asset, a clean piece of tax base, and only wished to be good neighbors."[102] The head of the study blamed mass media for the situation and said that though there have not been

similar studies anywhere else, he thought the conclusions would be similar in other areas of the nation.[103]

Besides that, there is the problem of the "information gap": some parts of the social stractum who already have more information are those more likely to achieve new information. The hypothesis, first formulated in 1950,[104] seems to be confirmed by the study of environmental knowledge dissemination in the U.S. At least, this was the conclusion of George Arthur Bailey, who surveyed the population of Madison, Wisconsin, about awareness of Earth Day events in 1970:

> This study confirmed a broad hypothesis relating public information and the media: when the media disseminate news or information about a public issue, the more educated segment of the audience is more likely to receive and assimilate that knowledge than is the less educated segment . . . In the particular case of the E-Day, the division between the informed and the uninformed both before and after the campaign and events, was the division between the educated and the uneducated, the young and the old, the professionals and the workers, and the habitual political activists and the passive.[105]

The "information gap hypothesis" has been well defined by Tichenor, Donohue and Olien:

> as the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease.[106]

They claim that this hypothesis "applies primarily to public affairs and science news having more or less general appeal."[107] Thus, it seems reasonable to assume

that this hypothesis can be applied to environmental news. Among the reasons why this gap occurs may be cited: communication skills (those people who are already better skilled to deal with mass media have an easier task to cope with their content), stored information (the knowledge already held eases the way to achieve new information), relevant social contact, selective exposure, acceptance, and retention of information, and the fact that most science and public affairs news is carried through printed media which are more likely to be attended by the more educated part of society.

According to Tichenor, Donohue and Olien,

> most of the data, tend to be consistent with the "increasing knowledge gap" hypothesis. To the extent that this hypothesis is tenable, it provides some sobering reflection on the "mass" impact of the media. At least for the subjects investigated here, the mass media seem to have a function similar to that of other social institutions: that of reinforcing or increasing existing inequities . . . Media coverage tends to wane before the knowledge gap closes, and this tendency may be especially apparent in science, where a new development or finding renders yesterday's news topic obsolete.[108]

If Tichenor, Donohue and Olien were right when they said that "the knowledge gap close may depend partly on whether the intensity of mass media publicity is maintained at a high level, or is reduced or eliminated at a point when only the more active persons have gained knowledge,"[109] then some of the authors on environment and mass media may be wrong when they recommend that the simple information should be stopped.

Murch, for instance, says that "it may, then, be time to turn from simply revealing the existence of environmental problems."[110] The E.P.A. states that "simply viewing with alarm is no longer newsworthy, informative or educational."[111] Both Murch and the E.P.A., for sure, are right when they demand for a broader kind of media action toward the environment problem. But maybe it would be wiser to tackle this broader action, without giving up of a high level (in quantity and quality) of informational matter, as it happened during the "explosion phase" in order to attempt to close the knowledge gap (despite the possibility of existence of "know-nothings" described by Hyman and Sheatsley[112]).

However, media need to improve their performance, if they are to contribute in a significant way to educate properly the population about environmental problem. Editors themselves recognize this need, as it was shown by John Maloney and Slovonsky Lynn. They sent questionnaires to 118 editors in 75 urban areas that the Federal Air Pollution Administration had designated as high air pollution areas in 1970 and they found that: many editors thought it is difficult to assign sufficiently knowledgeable reporters to the pollution beat; many editors saw the need to abdicate a simple position of neutrality and to take the lead in the war on pollution; many editors stressed the importance of highlighting local issues and relating

environmental problems to the individual, without overlooking the universality of the situation.[113]

This kind of concern is exactly what the critics of media performance have demanded from them. Murch, for instance, asked the media to "generate clear and specific proposals for dealing with" the environmental problem, "proposals that show the individual just how he can become engaged in the struggle within his own community."[114] The E.P.A. says that news should attempt to suggest specific things that people can do to help the cause of a better local environment (for example: give them a telephone number to call if they see a suspected violation of an environmental law, or the time and place of important public hearings or still the names and addresses of public officials to write to on pending environmental decisions, bills, appropriations, etc.) and also should relate environmental problems to people, showing their effects on health, recreation, economy, quality of life, etc.[115]

For Rita James Simon, environmental news should be more explicit in showing to the public the relationships which exist in the environmental problems. In a survey carried out by her in Illinois, she discovered that people, though concerned about pollution problems, are not able to figure out what are the reasons for these problems and, therefore, do not know what should be done to solve them.[116] Keith Stamm also believes that media should furnish people

with an "ecological orientation," meaning an awareness that all life process is interrelated.[114]

Judith Hofman Moore thinks that it is indispensable a larger knowledge of the audience by the media, in order to communicate effectively the environmental message: "as the scientist . . . attempts to reach the public via a communicator, he needs someone who not only has an awareness of the problem he is trying to communicate but someone who has some idea what the audience can understand or comprehend."[118]

Rubin and Sachs furnish a list of more practical advice which can soon improve media performance in communicating environment news. Among them are:

> --media should create a special environmental page or a continuing broadcast feature which might contain news of environmental legislation, public hearings and meetings on environmental matters, and the activities of industry and ecology organizations
>
> --advertisers for this page or feature might be sought from the many companies manufacturing pollution control equipment
>
> --editors and reporters should make a greater effort to provide specific information the public can use, such as the names of companies with lengthy records of violating anti-pollution laws, the performance of public officials in enforcing those laws, the way to obtain government and academic reports about the environment, and the names of groups lobbying for and against environmental bills
>
> --if the news medium itself does not have time or space to discuss a complex subject, it might offer the audience a list of sources for further reading
>
> --without surrendering balance and fairness in reporting, newsmen should give more attention to non-government, nonindustry news sources (looking for citizen groups, scientists, physicians and professional societies).[119]

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CHAPTER III

PERSUASION

The preceding section intended to show how mass media have been delivering news about environmental problems and how this news has been acting over the audience. This section will deal with intentional attempts to persuade people to adopt some behavior, how public opinion has reacted to these attempts and how they can have their chances to be successful improved.

Information Is Not Enough

As it was seen priorly, there has been a very large amount of information about environmental problem reaching the public. However, information maybe will not be enough for the achievement of environmental education goals. There is a great controversy among researchers whether information is enough condition to create attitude change. In the very field of communication concerning environmental problems, many authors have been diverging among themselves about this subject.

James Swan, for instance after stating that the legitimacy of the environment as a high priority domestic issue depends on human decisions and their two components, information and values, pointed out:

> This flood of new knowledge increases the possibility for increased environmental concern, but it does not guarantee it. Unless the current value systems deem this information important, it will produce little increased concern. Currently our social values are in a process of change . . . Initial attacks on environmental problems such as litter clean-up campaigns have received widespread support because they attack the symptoms of the problem, rather than the problem itself. As more basic solutions such as changes in values and life styles are proposed, it is likely that the easy popularity the environmental movement has enjoyed so far will decline . . . If we value environmental and social quality, however, and if we want future generations to enjoy this quality, too, then some basic social changes will have to be made.[1]

Keith Stamm recognizes the power mass media enjoy to produce increasing in public knowledge, but he doubts if the same power endows mass media to change attitudes and values, task which is demanded by environmental educators. He conducted a study about awareness of scarcity problems in 1970 and concluded that:

> The results of the study suggest that environmental education via mass media will not be the only (or even the main) influence in shaping individual's environmental attitudes . . . though the media play a role in creating awareness of scarcity problems.[2]

Stamm is not very optimistic about the power of mass media to change attitudes toward environment:

> . . . it is impossible to make any simple statement about the potency of mass communication to change environmental attitudes. One variable is the

> salience of the objects involved. It is extremely unlikely that attitudes toward high salience objects could be changed without multiple exposure to messages over a substantial period of time . . . This is not to say that environmental education efforts produce no cognitive change where high salience objects are involved, although it does suggest that we should revise our thinking about what we can expect to accomplish . . . Changes in attitudinal structure no doubt will occur as a result of environmental communication efforts, but we are only beginning to develop the concepts and the measuring instruments that will allow us to detect these changes. Prediction of what particular structural changes will occur is yet to be studied.[3]

Many studies, indeed, not only do not warrant very much optimism about mass media capacity to alter attitude toward environmental problems, but show some evidence that there may be an inverse relationship between knowledge about an environmental problem and commitment to participate in its solution, particularly if this knowledge is derived from mass media.[4]

Sharma, Kivlin and Fliegel surveyed 225 adults in a town in Illinois, where there was an acute pollution problem and they discovered that although most of the respondents were at least superficially aware of the problem and its reasons,

> concerns have not crystallized into a coherent movement toward solution . . . mass media exposure has not created a general attitude against water pollution in our sample town. And we did not find mass media variables useful in predicting commitment to solving the local pollution problem . . . discussion with family and friends is more closely linked to a commitment to solution of the problem.[5]

These findings can hardly be seen as something new, for as far as 1962, Wilbur Schramm had already warned that

learning new scientific information does not necessarily set into motion a logical chain of belief attitude and behavior.[6] But the empirical evidence showed by the studies which dealt specifically with the problem of mass media and environmental problem does help to ease the way of communicators involved in this activity.

Tichenor, Donohue and Olien revised in 1971 the literature about the subject and concluded that being more informed about environmental issues does not necessarily mean that a person will be more favorable toward enforcement of controls.[7]

Maloney and Slovonsky share the same viewpoint:

> . . . mere coverage of the issue by the mass media is not enough to assure any progress toward overcoming the pollution problem. The challenge . . . is to involve the public in making the very crucial decisions affecting the quality of life throughout the nation.[8]

They also suggest that "the media are less likely to affect public opinion . . . when there are no community organizations involved in the issue at the grass-roots level to encourage conversation and action."[9]

However, the studies developed so far are not unanimous about the subject. Many of them show that knowledge was linked with attitude change and even helped to predict behavior. One of them was carried out by Willeke in the San Francisco Bay area,[10] another by Swan in Detroit,[11] and Lingwood in Ann Arbor.[12] In all three studies, respondents who had received more information

about pollution problems were more likely to consider the problems more seriously, to perceive better danger and damages caused by pollution and even (in Lingwood's survey) to affirm that their behavior would be changed in function of the information received.

Another study conducted by Chaffee, Ward and Tipton showed that at least among youth the amount of information may be positively related to attitude shaping. They acknowledge that the influence of mass media is much larger in knowledge than in overt behavior, but point out that at least the young respondents of their survey attributed both informative and opinion-making power to the media:

> The more knowledgeable are more likely to say they rely on the media, whereas the less knowledgeable turn to more personal sources to their information and opinions. Perhaps our most surprising finding is the extent to which the youngsters feel their opinions (as distinct from information) are based on mass media reports. They rate the media as more influential than parents, teachers or peers.[13]

Nevertheless, they warn that "we have no external test here of opinion-formation, so we can only report this as their introspective self-description, i.e., as a hypothesis."[14] But they are very positive when say that "while media influences may be to an extent modified by intervening personal interactions, there can be little doubt that mass communication has some direct effects on the developing adolescent."[15]

Fitzsimmons and Osburn studied the effects of five TV documentaries and concluded that exposure led to

significant gains in information level (which was retained over a four week period at a very high level); generally exposure also led to modification of attitudes in the expected direction (but these effects were clearly limited over time); changes on attitudes most felt were the increasing of assessing of the topic's importance, the increasing of certainty already held, the formation of closures on new positions held and the increasing of feelings about the subject; generally, exposure did not influence reported willingness to engage behavior; initial level of information did not have influence on changing attitudes and initial attitudes had no effect on information gain either; importance of an issue, interest and intensity of feelings seemed to go together; where potential behavior increased, this was related to interest and intensity, and to change in attitudes.[16]

Willian Witt, through another method, also means that amount of information is positively related to public attitude when he says that one of his studies

> suggests that social systems, being made up of many audiences, also tend to become selectively exposed, because gatekeepers are themselves secondary audiences, responding to feedback from their own audiences. This results in greater amounts of news about subjects to which the systems are favorably disposed.[17]

A more cautious and perhaps more accurate position about this controversy of amount of information and attitude is held by William Alper and Thomas Leidy. They studied the effects of a CBS-TV program on high school students. They

say that "information need not lead to attitude change, but attitude change is improbable without any imput of information."[18]

Another cautious position is the one supported by Douglas, Westley and Chaffee. They say knowledge and attitudes should be highly and positively correlated for topics where informed people are unlikely to differ. For highly controversial topics, the relationship between knowledge and attitudes may be less predictable.[19]

Whoever may be right in this controversy, there may be little doubt that the information process differs very much from the persuasion one, though they may be related. Communication research available does offer some hints about how to be successful on persuasion attempts. But before these attempts can be performed, it is necessary to have objectives.

Objectives

If a persuasion attempt is to be successful, the persons who are going to perform it need to have some feasible and clearly stated objective in mind. In the first section of this work the broad goals of environmental education were specified according to one author. But what must be the mass media role in achieving those goals seems to be a disputable question, if one is asked to turn into specific objectives.

Maloney and Slovonski alerted to the danger of getting lost if there is no consensus about how to act, warning that "there appears to be more than ample opportunity for the public to become confused rather than enlightened in ways that would be conducive to a 'public consensus.'"[20]

Keith Stamm gives his opinion about which must be the communication's role in achieving the environmental education goals:

> Perhaps the greatest contribution that communication researchers can make at this time is to promote appreciation among public officials of the coorientational nature of environmental management decisions, and to provide the methodology for evaluating the state of coorientation between policy-makers and the public on particular issues. The fruits of such research would be much greater than a further search for more effective persuasive strategies.[21]

At another position, extremely opposed to Stamm's one, is Jerry Mander, who says that

> preparing the public for the changing facts of life is, of course, the major effort and requires every bit of media understanding and cooperation.[22]

Mander says that the effort which must be carried out by mass media is comparable with that of preparing the country for a wartime economy and he is optimistic: "I don't think the communication problems are insurmountable. Great things were achieved during World War II when another sort of rationing became the absolute requirement."[23]

At an intermediary stance is Timothy O'Riordan. He says, as Stamm does, that

> it would undoubtedly be desirable . . . to involve public opinion before final decisions are made, and it would appear that the dialogue that should take place should be based on as much information as is reasonably possible to provide an adequate understanding of that information, a willingness on the part of resource managers and professional advisers to incorporate public opinion in their deliberations, and a reasonable sense of trust among all participants involved. Whether such an ideal state of affairs can ever be achieved is, of course, the major question, for there are a number of pitfalls along this path.[24]

He cites some of those pitfalls: not everyone can get excited about pollution control; not everyone wishes to be involved in the deliberations of all public issues; it may not be possible for everyone who is interested to have a sufficient grasp of a complex issue as to be capable of making a sound judgement; finally, by requesting public response, the environmental manager is faced with so many alternative suggestions that to make any decision at all within a reasonable space of time becomes impossible.[25]

O'Riordan believes that "some of these potential difficulties can be tackled. For example, environmental education is still in its infancy and, as it grows, the reservoir of public knowledge and awareness will expand enormously."[26]

It seems that Stamm confused means with ends. He wants to reach an end, but in the way to do that, he wants to eliminate the means to achieve the original goal (more public information and persuasive attempts to change public's attitudes).

O'Riordan concludes his opinion by stating that:

> . . . in the final analysis, success will depend upon our individual and collective desire to seek better standards of environmental quality, a determination which will require that we clearly recognize the sacrifices we must make in the reduction of other desirable objectives such as material wealth and individual freedom. If we cannot make such a commitment, then surely public opinion will continue to be inconsistent, shifting and unclear, and hence the value of public opinion analysis as a guide for long term public policies in environmental management will be increasingly called to question.[27]

Such a commitment, of course, will demand for persuasion attempts and mass media will for sure be one of the tools for these attempts. How this tool can be successfully used is what will be examined next.

Persuasion Through Mass Media

Wilbur Schramm is very careful when he talks about the capacity of mass media to persuade:

> Few, if any, examples of radical changes in basic beliefs, values, or behavior deriving directly from mass communication have been demonstrated. Moreover, it is clear that mass communications are seldom, if ever, the sole agent behind any change. Rather, they function as just one element in a highly complex social system; their impact is moderated and mediated by numerous other factors in the system . . . On the other hand, generalizations such as the preceding risk the danger of leading us to underestimate those contributions to social behavior which the mass media do make.[28]

Of course, the effects of mass communication persuasion attempts depend on many variables, such as previous public attitude toward the subject (which seems to be a key factor), social pressures, personality characteristics and

others concerning the audience. There are also many message variables that have influence on the results of a persuasion attemtp such as quality, relevance, quantity and clarity.

Communication researchers, however, have already put together a whole series of rules which are likely to make a message more efficient in persuasive communication, including mass communication. Authors such as Bettinghaus,[29] Karlins and Abelson,[30] Zimbardo and Ebbesen,[31] Berelson, Lazarsfeld and McPhee,[32] Hovland,[33] among others may be particularly useful for those who intend to use mass media to convey environmental issues with persuasive objectives.

As Melvin De Fleur has stated,

> the relationship between contemporary perspectives on mass communication and conceptualizations of how persuasion can be achieved is not a straightforward one . . . Nevertheless, analyses of contemporary persuasion campaigns reveal certain significant similarities in their apparent underlying assumptions about how the persuasion works.[34]

De Fleur himself describes two models of persuasion: the psychodynamic (message alters or activates latent psychological process what achieves desired overt action linked to the psychological process) and the sociocultural model (message defines or redefines sociocultural process of groups, forming or altering definitions of socially approved behavior for group members, what achieves change in direction of overt behavior). The second model seems to be the one in which mass media better fit:

> Persuasive message presented via the mass media may provide the appearance of consensus regarding orientation and action with respect to a given object or goal of persuasion.[35]

Through mass media, the communicator can show social sanctions and social rewards or approval stemming from some behaviors. In the case of environmental matters, the communicator should attempt to show that there is a consensus about behaving in a certain ecologically positive manner and that those people who do so will receive social approval and will be more well regarded by the social group than those who do not do so.

Paul Lazarsfeld and Robert Merton say that at least one of three conditions must be satisfied in order to persuasive attempts through mass media to prove effective. The conditions would be: monopolization (absence of counter-propaganda), canalization rather than change of basic values (utilization and reinforcement of already existing attitudes) and supplementary face-to-face contact.[36] Environmental educators can fulfill at least the last two conditions, if they are well organized and have specific objectives. But, doubtless, it is a hard work to satisfy any of those conditions.

However, the persuasion model which seems to be the most useful one is that formulated by Dorwin Cartwright. He used the findings of the war bond experiments to say that, in order to influence behavior (what would be the last goal of environmental education), communications must activate

three basic psychological processes by creating: (1) a particular cognitive structure; (2) a particular motivational structure; (3) a particular behavioral structure.[37]

Cartwright stresses the point that the three processes are equally important, fact that is often forgotten by those who design persuasive campaigns and ignore the two last of the three processes. In order to create a cognitive structure, the message must: (1) reach the sense organs of the receiver; (2) be selected by the receiver; (3) be accepted as a part of the receiver's cognitive structure or to produce changes in the cognitive structure. To create a motivational structure, the message must: (1) show to the receiver that the desired action will be a path to some goal he has; (2) if possible, show that the action may be a path to many receivers' goals; (3) show that the action is more rewardable than other existing and available paths to the same goal(s). To create a behavioral structure, the message must: (1) lead receivers to action by showing them specifically how and when to act (if the action is not defined quite specifically, it may not be carried out, even if it is regarded as desirable); (2) if possible, place the receiver in a situation requiring a decision to be taken.[38]

Brewster Smith applied the Cartwright's model in a kind of subject which is close to environmental ones: family planning. And he said that the third step (to create a particular behavioral structure) is the hardest one

to be achieved. In his case, the variety of actions desired and their complexity hindered the way of achieving the third step of the model.[39]

Smith concluded that the complete adoption of a new behavior is not a simple act, but is a process comprised of several steps or stages (awareness and interest, information gathering, evaluation and decision to try, implementation and adoption). He also warned that the planning of communication strategies requires information about the target population in respect to many aspects, including readiness to adopt the advised behaviors.[40]

Brewster Smith offers many valuable suggestions for anyone who is likely to try persuasive campaigns:

> In general, people's beliefs, attitudes and behaviors tend to be stable. Demands and arguments for change, uncomfortable new facts that do not fit neatly into accustomed categories are likely to be resisted . . . Much effort is wasted in futile persuasive efforts because this paramount fact of resistance is neglected or underestimated . . . Some pilot testing of materials and approach is normally called for before any substantial outlay of funds and efforts is warranted.[41]

One very important point is made by Smith and must be kept in mind by environmental educators:

> The most strategic class of factors governing the effectiveness of persuasive communication in this application seems to me to be essentially political, not scientific or technical . . . Gains in the political front would permit persuasive efforts to be directed to a larger extent than is presently the case in most countries toward objectives and via channels that have a fair chance of circumventing human resistance and producing substantial differences in people's habits. Logistical problems would then emerge as a close second to political ones in strategic relevance.[42]

Smith was talking about family-planning, but the analysis he made fits perfectly into the environmental problem and his considerations should not be neglected by those who are going to deal with it.

The Most Likely Functions

Regarding specifically the environmental question, two functions in the field of communication and attitude seem to be the most likely to be performed successfully by the mass media: creation and crystallization of attitude.

These functions may be still more important in countries where the environmental information is still a very new one, where the "explosion phase" which occurred in the United States seven years ago still is in its two first years.

Donald F. Roberts says that

> the mass communications are not the most effective means for influencing immediate change of established beliefs, opinions, attitudes or values. Because of the nature of the media, the heterogeneity of the mass audience, the mass media cannot tailor their messages to meet the needs and beliefs of individual receivers . . . On the other hand, mass communications may have a great deal to do with how we structure the world over the long term, and with how we organize new aspects of the image, form new opinions and beliefs.[43]

Maxwell McCombs defines crystallization this way:

> Crystallization refers to the evolution of learning of an attitude. In the extreme, this means acquisition of an attitude where none previously existed. More frequently, it means shaping some previously vague predilection. In any event, the mass media are cast more in the role of teaching and defining than of advocating, as in the case of conversion or reinforcement.[44]

McCombs also says that mass communication's role has been underestimated because emphasis of communication scientists on attitude change has overlooked the fundamental question: creation of any opinion at all.[45]

It does not seem too risky to assume that in countries such as Brazil most of the people do not have yet any opinion formed (or at least strongly held) about environmental questions because this is still an issue not too much explored by the mass media. Furthermore, at least where Brazil is concerned, the attitude people spontaneously held toward conservation, nature and environment is a positive one. More: Brazilian population is predominantly composed by people whose age is less than eighteen years old. For all these reasons, the perspectives of using mass media successfully in the process of creation and crystallization of attitudes toward environment in a country such that seem to be optimistic.

Besides that, the process might be fastened if a period of social change is characterized. According to Serena Wade,

> regardless of the media consumer's age, if direct experience and mediated reality images are reciprocal variables in any equation developed to compute media effects on society, then direct effects should be most visible during periods of social change. During these change periods, direct experience with new social reality is likely to be at its lowest point. The media, then, are in strong position from which to define what the new social reality "ought" or "seems" to be.[46]

This opinion seems to be also shared by Bettinghaus, who says that

> social action is not an automatic process through which any new idea is easily introduced into an institution, community, state or nation . . . Sometimes, the occurrence of a crisis within the community will make it possible to introduce a new idea successfully.[47]

As it will be seen in the second part of this work, the possibility of emergence of environmental crises in some parts of Brazil is not remote. Thus, if Wade and Bettinghaus are correct in their assumptions, a fact like that would make conditions still more favorable for mass media's effective persuasive attempt. The same can be said for any other country, of course.

Rewards, Interest, Motivation

These three factors are very important in the persuasion process and are linked one to another. Rewards stir up interest and motivation and all three seem to go always together with a larger possibility of success in the persuasive attempt.

Despite their importance, there are very few studies dealing with the general case of promised rewards in persuasive communication situations. Erwin Bettinghaus suggests that one of the reaons for that may be the fact that

> what is a reward for one individual may not be perceived as reward for another . . . What this suggests is that we must look closely at the people involved in a specific situation and attempt to determine just what type of reward might prove motivating . . . Despite the lack of specific evidence, the use of

> messages which appeal to, or offer the receiver some personal gain can be extremely effective. Why should an individual receiver be concerned about the pollution of a city several hundred miles away from his own house? If the source can point out how the control of pollution will benefit him personally, he is more likely to accept the message.[48]

G. D. Wiebe also stresses the need of making the receiver perceive that the problem is his own, but also that the costs and rewards (psychological as well as material) will compensate him or her.[49]

Studying the case of a controversy over methods of flood control and water conservation in Eastern Kansas, E. Jackson Baur concluded that

> the results of this study of a local controversy suggest that public opinion is formed through subtle processes of values and interests. There was little evidence to support the conception of the public opinion process as a logical confrontation and persuasion by rival proponents in public debate. Instead, the changes, though initiated by formal organizations and projected through mass media, were amplified and supplemented by informal sources of information and transformed into opinions through interpersonal communication, especially effective in primary relationships.[50]

Thus, the value system held by the audience must be taken in consideration, but not only in what refers to ends, but also means, as explained by Joe M. Bohlen:

> this value-system is the basis of a set of tendencies to act in given direction, vis-à-vis various categories of stimuli. These tendencies to act, or attitudes, are major influences in the determination of man's behavior. Since man is not a UNIVAT, frequently he holds conflicting values and attitudes without serious deleterious mental consequences. In many instances, man segments his total attitude pattern. He may act rationally and consistently within a given area of values, even though these actions may be in conflict with another area of values. As a man receives

> stimuli and contemplates alternative responses, he takes both ends and means in consideration. Part of man's value system is the tendency to organize both ends and means into hierarchies of favorableness to himself as an individual. He then places these in juxtaposition when making his choices of alternatives. In this process, a lower level or less favorable end may be selected because the means of attaining the higher level or more favorable end are too unsatisfactory to be acceptable.[51]

These observations may be very important because stress the point that rewards offered to the audience must be not only convenient in terms of high objectives, but also in terns of feasibility and acceptibility of means. In theory, almost everybody is favorable to the idea of having a clean and healthy environment. But few people act to achieve that end, perhaps because the means seem to be unsatisfactory or demanding too much effort, or still giving back too little reward. Thus, it seems a good advice to remember this point when designing a persuasive attempt.

Leading to Action

E. Jackson Baur has showed above that interpersonal communication was a very effective way to achieve attitude change in a controversy about an environmental issue in Kansas. The simple discussion of a subject may be considered a kind of participation and action over that subject. And there is enough evidence, according to many authors in the field of persuasion,[52] that active participation is more effective than passive one in persuasive

attempts. The effectiveness of a persuasive appeal is increased when exposure to the communication depends on an effortful action.[53] Karlins and Abelson define participation as "a heightened degree of involvement," what goes from group discussion to active engagement in a cause.[54] They also affirm that participation not only reduces resistance, but also enhances persistence.[55]

In Bettinghaus' opinion,

> many contemporary campaigns worthy of great support, have failed because the participants in persuasion were given nothing to do. We argue with a friend, "pollution is bad. We must reduce pollution" . . . Then we stop communicating, assuming that we have done our job. But the message may not be assimilated into a frame of reference, nor responded to, because we have failed to tell the individual what he can do to stop pollution.[56]

Bettinghaus gives an example in which participation proved to be an effective tool to persuasive attempts:

> Several months ago, an ecologist made a speech about pollution. He gained considerable support from his audience. They were "with him." Then he offered to take them on a walk through the city, where they were to show him what they had learned about pollution. As they walked, he asked people to help him identify some of the sources of environmental pollution in the area they were walking through. They did so, and then he asked them to walk back over the same route with him. This time, he pointed out all of the conditions they had missed. It was a dramatic performance and the audience members were able to sharpen their appreciation of the problems he had originally pointed out when their own performance was corrected. Rewards are important to successful learning, but human responses can be improved if the individual can be told what he did wrong.[57]

For sure, this kind of performance is not possible when the communicator is using mass media. But the broader

concept is still important: some ways of leading the audience to participate in some active form can increase the chances of success of a persuasive attempt.

The Problem of Attitude

This problem seems to be a paramount one in the field of persuasion, though evidence is not enough yet to allow many secure and definitive statements about it. This section will be divided into three parts: the current attitude of the American people toward environmental problems, the questions of attitude linked to behavior and the question of how long attitudes can be held after changed or created.

Attitudes Toward Environment

Many authors have stressed the importance of the prior attitude toward a subject in the process of a persuasive attempt on that attitude, as it has already been seen. Therefore, it is important to have at least some idea about how the public feels toward environmental issues before trying to influence it. Brazilian data will be showed in the second part of this work. Here the American attitude toward environment will be summarized.

> Recently, the New York Times stated in an editorial that too much has happened since the first Earth Day, close to six years ago, to permit the easy belief that Americans care about the air, water, and land of this country only incidentally and after all their other problems have been solved. The most

> striking of a series of similar findings by public opinion surveys is that six out of ten people are more concerned with improving the environment than they are with tax reduction or a curb on prices.[58]

Many environmental educators show optimism toward their objectives, in consequence of the results of public opinion attitude surveys. Murch, for instance, after demanding a more active performance from the mass media, pointed out that

> although this is clearly a more demanding assignment, communicators may be encouraged by the optimism and the perhaps unsuspected willingness of many individuals to assume some responsibility for restoring the environment, even to the point of paying certain economic and political costs to do so.[59]

Indeed, there may be little or no doubt from the results of polls that almost every American is at least aware of the environmental problem and its importance. Hazel Erskine in 1972 talked of "a miracle of public opinion" because of the "unprecedented speed and urgency with which ecological issues have burst into American consciousness."[60] She reviewed surveys carried out between 1965 and 1970 and concluded that there was also an attitude of willingness to pay for a cleaner environment growing up among Americans.[61]

However, the results do not warrant only optimistic foresights. For instance, Rita James Simon showed that almost everyone knows about pollution but few are able to indicate the pollution's causes or possible solutions.[62] De Groot, in a perhaps outdated survey (1967) concluded that the citizen's concern about pollution was the

atmospheric quality of the individual's proximal environment and only that.[63]

Tognacci, Weigel, Wideen and Vernon found that the public concern about environmental quality may not be so universal as many have been pretending. Their survey in Colorado showed that: persons holding a more liberal socio-political outlook are more concerned about environmental issues than are more conservatively oriented individuals; concern about ecological issues appears to be negatively related to age and positively associated with both socio-economic status and amount of formal education.[64] They concluded that

> the picture of the environmentalist which emerges from the present investigation seems quite clear. The environmentally concerned individual tends to be more liberal in sociopolitical orientation, younger and more educated than persons who remain less concerned about ecological issues. Our results also provide tentative indications that socio-economic status may be directly associated with environment . . . The strength and consistency of the observed relationships permit greater confidence in interpreting these results . . . If the ecology movement is to increase its impact on public policy, it might do well to attend to means of demonstrating to conservatively oriented individuals, to the old, to the poor and to the less-well-educated that environmental issues are relevant to their lives.[65]

Their findings were confirmed by another research, this conducted by Edmond Costantini and Kenneth Hanf, though the relation between socioeconomic condition and environmental concern has not been supported.[66]

James A. Swan also reviewed (in 1972) the polls about environmental attitudes and concluded that

> few people spontaneously express concern about air pollution, even if they live in areas experiencing high levels of air pollution. When they are specifically asked about, larger percentages acknowledged that the problem exists . . . Few people ever bother to register any complaints with public officials about air pollution, even if the respondents recognize that air pollution exists in their area.[67]

Perhaps the most recent survey carried out in order to assess public attitude toward environmental issues is the one conducted by Opinion Research Corporation in August 1975.[68] Some of its conclusions:

> Even during a time of recession, high unemployment, and rising fuel costs, the public does not voice a readiness to cut back on environmental control programs to solve economic and energy problems. In fact, six people in ten say that it is important to pay the price necessary to protect the environment. A plurality (48% vs. 38%) say it is more important to have pollution control devices on cars than it is to keep the prices of automobiles lower by eliminating such devices.[69]

However, the same survey shows that younger people, the better educated, and environmentalists display the most support for the environmentally favorable viewpoints, though this attitude is held by a majority in almost all of the key population subgroups. When questions in the survey depict a direct negative effect over the individual's life, the opinion turns much more divided. For instance, when asked whether cleaning the environment is more important, even if it means closing down some old plants and causing some unemployment, the opinions were sharply divided. Majorities in favor of environment control in

this case only appeared among the younger, more educated and richer people.[70]

Attitude and Behavior

Although the data available about public attitude toward environment, therefore, are not definitive, it is reasonable to conclude that there seems to be a widespread concern and an almost always favorable attitude among the American people.

But the question is whether this attitude actually leads to an environmentally positive behavior. Interviewed people often are answering about problems they never had thought much about, they know that what they answer does not oblige them to act conformly and they may try to appear as better citizens than they indeed are. There is some evidence that positive attitude may not lead to positive behavior.

Keith Stamm, for instance, states:

> . . . There are some good reasons, however, for arguing that a concept of environmental attitude never will provide an adequate basis for explaining the individual's environmental behavior.[71]

In fact, there is a vast literature to support the hypothesis that attitude and behavior are not necessarily related in any situation.[72] In the specific field of environment, Medalia and Finker showed in 1965 that while 85 percent of the sample surveyed by them agreed that air pollution was a problem in their town, only 10 percent said

they had considered asking some agency to take action on the problem and 2 percent said they had ever made a complaint.[73]

Tichenor et al., in 1971, showed that a majority of their sample supported conservation rather than progress, but at the same time were largely unwilling to eliminate tax deductions as a population control measure.[74]

Reviewing some of those studies, Stamm concluded that

> allied with the notion that desirable behavior will follow from proper environmental attitudes is the further notion that proper attitudes result from greater knowledge and information.[75]

However, as it was seen, research has not always supported neither the first nor the second of these hypotheses. Trying to explain why this occurs, Kenneth Novic and Peter Sandman cite Wiebe's "syndrome of well-informed futility" and point out that the result of that syndrome may well be

> an attitude system essentially independent of behavior. Though attitudes are often defined as predispositions to act, the link is uncertain at best; on broad social issues it may not exist. "I should do this" is a different sort of attitude from "this should be done." The individual who believes that "this should be done" about an important issue--where "this" is something the individual cannot do--has an attitude that can never find expression or reinforcement in behavior. However "concerned" that individual may be, the "concern" is passive. The difference in impact between information from the mass media and information from personal sources may be especially acute when the topic is environmental deterioration . . . The difference could only be exacerbated by the fact that the mass media typically fail to suggest what actions their audience could take to alleviate the environmental problems they have reported . . . The

> impersonality of mass media information may encourage people to view pollution--and its solution--as external to themselves . . .[76]

Novic and Sandman made an experiment with 158 students at University of Michigan and found evidence to support the hypotheses stated above.[77] However, their observations may be helpful to mass communicators because they make clear that it is possible if not eliminate, at least attenuate the problem by providing the audience with specific information about local issues and how the individual can act to help solve them.

Frank M. Potter, Jr. asks why, if there is a general sympathetic attitude toward environment, nobody does anything to solve the problems and attempts to answer by saying that

> the most significant inhibitor of action may be that we are too easily convinced of our own political impotence . . . On the other hand, when they are really aroused, people can take and have taken effective action.[78]

Therefore, another role to mass media might be to show to the audience that individuals can do something about the environmental problems and provide it with examples in which this has happened.

Karlins and Abelson suggest that attitudes can be a good predictor of behavior if the persuader takes into account the reasons underlying attitudes as well as the attitudes themselves.[79] Other authors have also supported this point of view, arguing that identical attitudes may have different motivational bases.[80]

Although few, there are also some recent studies showing the possibility of positive relationship between attitude and overt behavior. Irving Crespi says that there are at least three types of situation in which it may occur: pre-election surveys, movie attendance, and consumer brand reference. And he suggests:

> . . . attitudes have predictable relationships with behavior to the extent that the actor has reliable expectations of the behavioral situation. It would follow that in loosely structured situations, such as occur when crowds gather and in times of rapid social change, pre-existing attitudes are far less determining of behavior than the dynamics of the situation itself.[81]

If this hypothesis is correct, it expands Wade's point of view stated priorly.[82] Not only times of social change ease the way to create attitude, but also to change it, for pre-existing attitudes will not be so important in determining behavior.

Persistence Over Time

After achieving the objective of creating, crystallizing or changing attitude, how long can it last? There are not many studies dealing with this subject. After reviewing all the literature available, Karlins and Abelson concluded that

> there is no conclusive evidence on how long a changed opinion stays that way . . . Actually, the "short-term" and "long-term" are both right: sometimes changed opinions are short-lived, other times, seemingly indestructible.[83]

The best indicator of long-lasting attitude seems to be the one described by Garber: when the audience believes that the statements made by the persuader are true and when the audience agrees with them, there is better chance for the attitude to last for more time.[84] This opinion is confirmed by Zimmerman and Bauer.[85]

However, other variables, such as relevance of the subject, personality characteristics of the receiver, degree of commitment pledged by the receiver to the opinion, amount of exposure time and others are likely to have influence, too, though there does not exist evidence to confirm this assumption.

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CHAPTER IV

CAMPAIGNS

Elihu Katz defined campaigns as "attempts, in the short run, to change opinions, attitudes and actions."[1] They are a special kind of persuasion attempts and may be one of the various tools to serve the objectives of environmental education.

Katz also differentiates two species of campaigns: the one he calls "all-or-none" (to purchase or not some commodity), which is more difficult to be successful, and the one which allows adoption of the desired action by steps.[2] An environmental campaign probably would be in the second category.

There is some literature about the possibilities of success and failure of campaigns. Katz stresses the importance of interpersonal networks of communication in the diffusion process in a campaign, and says that mass media are effective acting an introductory or informational role, while personal sources are more likely to be successful in the activating or legitimating role.[3]

This may suggest that any environmental campaign should be provided with groups of people able to exercise the activating role, in order to improve the possibilities of success.

In a landmark study, Hyman and Sheatsley identified the "know-nothings," people who, for some psychological problems, cannot be reached by an information campaign because they simply do not want to be informed, even if they are physically exposed to the campaign material.[4]

They also showed that motivation is an important factor in any kind of campaign: "the widest possible dissemination of material may be ineffective if it is not geared to the public's interests."[5]

They also offered suggestions which may be very useful for any campaign designer:

> Those responsible for information campaigns cannot rely simply on "increasing the flow" to spread their information effectively . . . Surveys can inform the information director of the whole structure of attitudes on any public issue. They can tell him the major factors affecting public opinion on the issues and the relative influence of these various factors in determining attitudes. They can tell to what extent information has reached the public and how far it has changed existing opinions.[6]

Many campaign managers do not desire to use public surveys because they may be very expensive. However, they will be less expensive than if the whole campaign prepared without their information, fail completely after being carried out.

Another important study in communication research concerning campaigns is the one conducted by Shirley Star and Helen Hughes, which investigated the educational campaign on the United Nations carried out in 1948, in Cincinnati. The main conclusion reached by them was that information to be disseminated at all must be interesting to the ordinary man because he has been made to only what impinges upon his own affairs.[7] If he is reached by the message but is not interested on it, probably neither his knowledge nor his behavior will change. Interest is prior for an informational campaign and information grows interesting when it is functional, that means, when it is so presented that it is seen to impinge upon one's personal concerns.

Despite these studies showed more failures than successes other authors have demonstrated that campaigns can be successful. Harold Mendelsohn, for instance, assumes that any information campaign can be successful, if it is well designed. The first step is to define targets able to reach a continuum ranging from those whose initial interest in a given subject may be extremely high to those who literally have no interest in what may be communicated.[9]

Mendelsohn suggests that communicators and evaluators work together in order to design an effective campaign.[10] Furthermore: goals must be set as specific objectives. Defining objectives which are feasible is one

of the essential points in the process. The communicator must be aware that he is likely to face public apathy and that social science research may be useful to overcome it.[11]

Going into the specific field of environmental issues, Rodolfo Salceda et al. have investigated an informational campaign on pesticides and could witness its success.[12] They said that

> failure characterizes many information campaigns that have been evaluated. Yet research in areas such as marketing and psychology does offer additional principles to which the campaign planner can turn. A number of these guidelines can be summarized under the teaching-learning principles of repetition, simplicity, and relevance. Others are persuasion principles dealing with threats, reinforcement, and prestige suggestions.[13]

The campaign they studied was carried out through radio, television, newspapers, mail-pieces, and group meetings and used some of the principles stated above. They found that the campaign both increased knowledge and influenced attitudes and concluded that "given the disheartening results of most efforts to evaluate public information campaigns, the experiment reported here offers encouragement to campaign planners."[14]

Another successful campaign recently studied was the one about mental retardation carried out in Wisconsin in 1965. Douglas, Westley and Chaffee studied it and concluded that "not only information gain can be obtained in a well organized campaign, but also attitude change."[15]

One of the important points stressed by them is that interpersonal channels were successfully activated by the mass media during the campaign, what contributed enormously for its favorable results.[16]

The need of appealing to concrete objectives, which can be able to stir interest among the audience was documented by Zimbardo and Ebbesen, when they commented on a Red Cross campaign to make people to donate blood: "the appeal once made by the Red Cross to the patriotism of potential donors proved to be a dismal failure. This was because abstract, ideological principles rarely motivate immediate, concrete action."[17]

The most important lesson to be learned from the available research on campaigns is that they must be interesting to people and appeal to their own interests, in an objective and practical fashion for as Samuel Lobel has stated, the masses of people can master complicated details as well as the more educated, <u>on things that interest them</u>.[18]

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CHAPTER V

ADVERTISEMENT

"The continued popularity of environment advertising themes--with agencies that do have some control over campaigns and some data on effectiveness is persuasive testimony on their impact," says Peter Sandman, analyzing the role that may be acted by advertising matters in the field of environmental education.[1]

Sandman, however, concludes with pessimism:

> Media advertising, then, is a powerful tool of environmental education--a tool which is firmly in the hands of the exploiters, not the preservers. We should try to redress this imbalance in the ecosystem of advertising through pressure against the most offensive commercial environmental ads and through greater use of noncommercial environmental ads. But given current economic realities, it is absurd to believe that the preservers will soon be able to compete effectively with the exploiters on their own turf.[2]

Despite the problems, some achievements have been obtained in the field. For instance, in San Francisco, California, there is a "Public Media Center," where seven communicators work, producing TV and radio spots about environmental subjects, such as energy, food, Earth Day, and others.

They have been using the FCC's Fairness Doctrine in their benefit: stations are expected to present both sides of public issues. In environmental affairs, PMC offers them the environmentalist version of the facts. According to PMC, over 100 TV stations and 500 radio stations have requested and aired their spots.[4]

Glenn Hirsch, one of the members of Public Media Center, believes their work is valuable and may be successful:

> Under the Fairness Doctrine of the Federal Communications Commission, broadcasters are required to balance their coverage of "controversial issues of public importance." We asked radio stations carrying the utility's ads (an utility nuclear power) to provide free reply time for the other side of the question. Only a fourth of the stations using the utility advertising complied. But then the utility cancelled their whole radio campaign. Why? Their own internal memos show that utility advertising is "neutralized" when another side of a controversial issue is presented, no matter how infrequently. This is because the American people presently hold their corporations in low esteem and so corporate advertising is only effective when it is shown in a vacuum and is not perceived by the audience to be "controversial" in any way. This points to the effectiveness of environmental advertising, even when it gets on the air infrequently.[5]

Bruce Howard and Henry Weinstein reported other successes in the past:

> A landmark event for the public interest advertising movement took place back in 1966, the year Congress seemed ready to authorize a series of dams on the Colorado River that would have inundated much of the Grand Canyon. The Sierra Club paid a small San Francisco advertising agency, Ferman, Mander and Gossage, to direct a campaign against the bill . . . The ad included a coupon readers could use to inform public officials of how they felt: Interior Secretary Stewart Udall received 20,000 coupons demanding the

> project be dropped. The dam project collapsed and Representative Wayne Aspinall, chairman of the House Interior and Insular Affairs Committee, gave the ads credit for defeat of the plan. The Grand Canyon victory gave Freeman, Mander and Gossage considerable prominence which they followed up over the next few years. Ads produced by the agency are credited with preserving a redwood forest in California, preventing miners and dam builders from encroaching on North Cascades National Park near Seattle and other environmental achievements.[6]

They also describe other important victory concerning environmental advertisement:

> In 1971, Friends of Earth in New York brought a successful suit under the Fairness Doctrine, arguing that commercials for high-powered cars took one side in the controversy over air pollution. The local NBC affiliate agreed to run ads produced by the New York Environmental Protection Agency, some of them in prime time.[7]

Studying the impact of various advertising practices on the knowledge, attitudes, and behavior of young children, Charles Atkin found that those children who viewed the "Indian" anti-littering Public Service Announcement "less often exhibited littering behavior afterwards, compared to those who did not see this ad."[8] He also discovered that PSA's are "watched most closely"[9] by pre-adolescents. These findings may be another hope that, if broadcast, ads with message of an environmentally desirable behavior will be well accepted by children and youth.

For sure, these are not definitive victories and much more should have been achieved if the environmental movement were able to effectively balance the disadvantage it holds referring to advertisement. But there is space for more realizations.

Rubin and Sachs, for instance, suggest that environmentalists could pressure media managers to exercise their right of censorship over advertisements which do not convey true statements or which they judge will mislead the public:

> To the extent that the media reject advertisements only for self-interested reasons, they are unlikely to begin rejecting environmental advertisements, unless public pressure or governmental regulation forces them to do so.[10]

Rubin and Sachs believe that environmental advertisement is deserving of censorship on two grounds: when ads give an inaccurate impression of the products or services advertised or when the ads are socially undesirable. Neither reason is employed by the mass media very frequently in their standards for accepting or rejecting ads.[11]

But not always, in Rubin and Sachs' opinion, media ignore concern about environmental ads only for self-interest reasons. It might be also a problem of plain lack of habit: media managers are not used to thinking about the social effects of advertisements or to judge them under this ground.[12]

Rubin and Sachs suggested some recommendations: untrue ads should be always rejected; other criteria would be to ban ads that encouraged new cars, unnecessary trips, pointless accessories, or increased production; other idea is to warn the public about the dangers of each product (as it has been doing with cigarettes).[13]

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CHAPTER VI

INSTRUCTION

By instruction, here, it is meant not the broad educational possibilities of mass media, which are exercised through their usual activities, such as transmission of news and entertainment matters. By instruction, it is meant the teaching of a specific body of subject matter as part of a formal course of study to a particular group of students.

Apparently, there is no study examining specifically the use of mass media in an instructional set of environmental matters. There are only some suggestions about how teachers could make use of mass media to improve their environmental courses, such as these, formulated by R. Thomas Tanner:

> Teachers have long utilized the mass media as vehicle of instruction. English teachers assign their students to watch a play on TV, science classes view TV commercials for pseudo-experimental tests against brand x, and social science students read the newspaper for comment on specific current events. In a similar manner, teachers can utilize the mass media to sensitize their students to environmental anomalies, ironies which are implicit therein.[1]

He cites as examples: oil ads, showing of animals at the edge of extinction as if they were living in normal conditions, hunting programs, TV travel shows, films, magazines, news reportings, and others.[2]

However, though there seems to be no specific study, the general knowledge already held by communication researchers about instructional use of mass media can furnish to environmental educators some guidelines about how to take best advantage of media if they intend to use them with instructional ends.

Educators have regarded mass media as very valuable tool for achieving their instructional goals. UNESCO, for instance, has stated that "the fact that broadcasting is a mass medium, the impact of which is not confined to particular social strata or geographic areas, make it an especially important tool in the pursuit of long-life education."[3] In another report, UNESCO said that "media of mass communications . . . can provide a continuous flow of information which enables people to participate intelligently in civic affairs, in discussions on issues of personal concern and in the decision making process."[4]

UNESCO's studies all over the world on the effectiveness of instructional media have always stressed the importance of the reception groups, the follow-up material and the establishment of feedback channels.[5] They have also stressed that

> . . . programs should be related closely to the needs and interests of the audience, should be action-oriented so that through group discussion and decision, practical projects could be undertaken both individually and collectively, should provide chances for feedback and stir up audience participation.[6]

Ignacy Wainewicz is very positive about the subject: "valid, effective educational broadcasting is possible only when two-way relationship exists between the educational broadcaster and the target audience."[7]

The UNESCO's studies were mainly concerned with adult education through mass media. But whatever the target audience's age, it is fundamental that the communicator who intends to achieve instructional goals have stated specific instructional objectives. How to state these objectives, task which is indeed the first and perhaps the most important step in the process, has been well explained by some authors who can be very useful to the environmental educator, such as: Mager,[8] Burke,[9] and Erickson and Curl.[10]

How to evaluate if those objectives have been achieved or not is another fundamental step. Among other authors, Keith Mielke[11] has studied this question and to consult his work may be also very useful to environmental educators who want to use mass media with instructional purposes.

Other researchers have studied instructional media and reached to certain generical and important conclusions. Among them, Godwin C. Chu and Wilbur Schramm.[12] Here are

some of their conclusions: there is no consistent evidence that any humor, animation or dramatization significantly contributes to learning from TV, except maybe for very young children; repeated showing results in more learning, but the best is a teacher directed follow-up; students will learn more from TV if motivated; supplementary activities or related adult interaction will significantly increase the effectiveness of instructional television for preschool and early elementary aged children; given favorable conditions, pupils can learn effectively from instructional radio; by and large, instructional television can more easily be used effectively for primary and secondary school students than for college students; there is no general area of studies where TV cannot be used efficiently to teach the students; whether instructional TV can teach students who view at home as effectively as students in the classroom seems to depend on other conditions; if a student being taught by instructional television can be given immediate knowledge of whether he has responded correctly he will learn more; given favorable conditions, pupils can learn from any instructional medium that may be available now.[13]

Other good general advice was given by Gerald Lesser: the program must be planned for a specific target audience; specific objectives that are relevant to the needs and interests of the target audience must be clearly understood and agreed on; a systematic multi-media approach

must be used in which both knowledge specialists and media specialists are employed; educators who are capable of learning and understanding the instructional characteristics of various media must be found; clear and careful provision for personal interaction must be made; evaluation and feedback arrangements must be made to monitor audience reaction and change the instructional material to suit audience needs.[14]

All these suggestions can be useful for any environmental educator who desires to attempt mass media use as an instructional tool. Some very good approaches have been tried in the United States and in other countries, using many of the advices offered by the available research in instructional media. For instance, a well documented one is the series produced by the Swedish Broadcasting Corporation, which was described by Rolf Lundgren, the director of its instructional programming unit:

> The series (intended for grade nine) started with a TV program giving a general survey of various kinds of pollution, the examples mainly taken from Sweden but also from other countries. Then three radio programs described more fully (a) water pollution, (b) air pollution, (c) soil pollution. Next a TV program described the effects on one place in Sweden of the various kinds of pollution, and a third TV program gave examples of possible future solutions, speculated about possible technological and scientific development that will help us solve our problems, etc. Then regional programs were added, two in each of the 11 regions of the Swedish Broadcasting Corporation. The first of the two regional programs gave very concrete information about pollution problems in the regions and suggested that students should propose measures to be taken against them, using the printed material and what they had learned from the TV and radio programs as a

> base for their concrete suggestions. In the second regional program some of the suggestions of students in the region were described and discussed. We consider this series (which has been broadcast several years) most successful, and what is principally interesting in it is the fact that we used four media: printed material, TV, national radio, and regional radio, and the important job of regional radio was to increase the interest in the whole project by making it more concrete and down-to-earth to all parts of the country.[15]

Another important project using many instructional media to teach environmental affairs is the one developed by the Miami-Dade Community College, in Florida. Its series "Man and Environment" also uses TV, printed material, and radio, with apparent success. These projects are a proof that instructional media may be an important tool for environmental education.

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CHAPTER VII

ENTERTAINMENT

In a study about mass communication and political socialization, Sidney Kraus suggests that the transmission of political knowledge and values through mass media is not necessarily made by political programs:

> Typically the introduction of media in political socialization research takes its cue from the word political and the variables measured are political usage, public affairs programs watched, political items read, attention to news and politics in media and the like. Nowhere do we find data about political socialization as a result of the regular media programming that children and adolescents view daily.[1]

Herbert Hyman also thinks that political socialization is not expressed solely through political messages, but also through religious, artistic, scientific, commercial, and entertainment contents. There are implicit political lessons within all the subjects and non-political contents mediate and also modify responses to political communication.[2]

The same may happen with environment. A whole set of values that indirectly deals with environment is transmitted by mass media in their regular daily programming.

For instance, Lynn White, Jr. says that the Christian values are, in part, responsible for the way the modern man has been destructful toward nature:

> Christianity inherited from Judaism not only a concept of time as non-repetitive and linear, but also a striking story of creation. By gradual stages a loving and all-powerful God had created light and darkness, the heavenly bodies, the earth and all its plants, animals, birds and fishes. Finally God had created Adam and, as an afterthought, Eve, to keep man from being lonely. Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes . . . Christianity is the most anthropocentric religion the world has seen . . . At the level of the common people this worked out in an interesting way. In antiquity every tree, every spring, every stream, every hill had its own genius loci, its guardian spirit . . . By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects.[3]

Furthermore, in White's view, Christianity also created an infinite desire for progress, in the material sense, which has justified most of the depredations man has attempted against nature.[4]

The Bible, therefore, may have seen the first mass medium to convey an anti-environment message without speaking specifically about environmental matters. Other mass media seem to have just followed the example of their predecessor.

Richard Means lists a series of cultural factors in America which make environmental improvements more difficult to be achieved. For instance, these values or assumptions have been held by Americans throughout generations:

that America has an abundance of natural resources, that population growth is a desirable national goal, that rural and urban styles of life are mutually exclusive, that people must be in constant mobility (socially and geographically) and that analytical thinking is the most desirable one.[5] Means warns: "we need some awareness of the cultural restraints that seem to work against direct understanding of environmental problems."[6]

Of course, all these values have been conveyed throughout the years by books, films, television and radio programs, songs, theater plays. It is natural that this fact has happened, for the entertainment contents of media must and do reflect the cultural values held by people.

Another mood toward natural environment held by Americans is well described by James McEvoy III:

> Historical evidence suggests that one early and prominent orientation to the natural environment was fear, and with this was linked the desire to conquer and control nature for man's ends . . . This view did not end with the decline of puritanism, but persisted throughout the seventeenth and eighteenth centuries during the westward expansion of the country.[7]

This value, called as "transformationist" by McEvoy, was of course often conveyed through western movies for many years, aiding to form a mentality toward nature which is against the principles of environmental education.

Peter Sandman believes that media entertainment could present a model of ways to face the environment, and indeed does that, but does in the wrong direction.[8] Sandman

does acknowledge the contributions of some programs such as Jacques Cousteau's, but says that

> most of the entertainment content of the media is environmentally irrelevant, and much of it is environmentally irresponsible; consider the hunting in "Wide World of Sports" or the resource management policies in "Bonanza" or the celebration of over large families in some situation comedies.[9]

Sandman goes further:

> More important: the educational content of media entertainment is unplanned, unintended, and unintegrated. Skilled propagandists could doubtless make a potent educational tool of media entertainment--they have done so with Sesame Street--but for better or worse, there are no skilled propagandists carefully orchestrating commercial network offerings. The contribution of media entertainment to environmental education is not negligible, but it certainly is not large.[10]

The best suggestion would probably be that mass media tried to convey through their entertainment programs another kind of moral and cultural values which also have a tradition in American history and have been held by many people throughout the years, such as those expressed by George Perkins Marsh in his 1864 book "Man and Nature" or by Wilbur Jackman in his 1891 book "Nature Study for the Common Schools." But, of course, it is highly improbable that this kind of consideration will be made by those people who decide what kind of programming will be produced and shown to the people. Much stronger pressures have not been able to ban violence from television entertainment contents.

However, it may serve as a hope the fact that an artist who sings about nature is today the most popular

show-business person in America. Though it must be considered that John Denver's philosophical concept of the world--"selling the notion of pastoral isolation to a mass audience"[11]--may be not very much morally enobling, nobody can deny that he has reached people effectively with his message.

As recently written in the New York Times,

> Denver's subject matter--his paeans to the joys of the natural world, the beauty of the mountains, to flowers, children, innocence and romantic love--seems to touch a need in his listeners for a return to the simple life. Songs like "Rocky Mountain High," "Sunshine on My Shoulders," and "Take Me Home, Country Roads," combined with Denver's sweet folkie voice, and his wholesome-as-wheatgerm manner, appear to be irresistible.[12]

Despite some studies have indicated that perhaps only a few people are concerned to the lyrics of pop songs and understand them,[13] John Denver's success may be, anyway, an indication that the values conveyed through media entertainment contents in America may be changing toward a more responsible environmental attitude.

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PART TWO

CHAPTER VIII

A COMPARISON: BRAZIL AND THE U.S.A.

In this second part, this work will present the primary data collected in Santos, Brazil in order to test the hypotheses which will be stated upon prior research available in the American communication literature. However, before that it seems advisable to make some comparisons between Brazil and the United States, in order to give to the reader a clearer idea about the circumstances surrounding the place where the primary data have been collected.

For this purpose, this section will be a rapid comparison between Brazilian and American mass media systems and between the metropolitan area of Santos and the metropolitan area of San Francisco, California (where Rubin and Sachs developed the most extensive work on mass media and environmental affairs).

This fast exploration of similarities and differences between Brazil and the U.S.A. probably will lead to a

deeper appreciation of the topics involved in this work and will offer a broader basis to assess the validity of its conclusions.

Media Systems Comparison

Some authors have tried to construct models to compare mass media systems through a cross-cultural approach. Among them: Wilbur Schramm,[1] Merrill and Lowenstein,[2] Siebert, Peterson, and Schramm,[3] Namurois,[4] and Wells.[5] Although all of those models present some problems, the one designed by Wells seems to satisfy the cross-cultural needs the most. This model will be the one used here.

Wells suggests five "key-dimensions" to compare mass media systems: control, finance, programming goals, target audience and feedback mechanism.[6] Using these "key-dimensions," here is a fast and superficial comparison between Brazilian and American mass media systems.

Control

Private enterprise is the rule, both in Brazil and the United States. Newspapers are owned by private groups in the two countries. While in the U.S. there seems to be a trend to concentration under chains,[7] such a trend does not appear in Brazil. The government in Brazil owns only one daily newspaper, which prints exclusively laws and official matters. Every state government there also owns a

daily newspaper like that. Radio and television, both in Brazil and the U.S., have their broadcasting controlled by the federal government. In both of them, private enterprises operate under government concession or license.[8] In the U.S., there are 549 non-commercial radio stations compared with 6719 commercial stations.[9] Most of American non-commercial stations are operated by colleges, universities, and public authorities for educational purposes. In Brazil, there are 54 non-commercial radio stations (almost all of them operated by state or federal governments) compared with 940 commercial stations.[10] All the non-commercial stations in Brazil are also dedicated to educational purposes. In the U.S. there are 220 non-commercial TV stations compared witb 701 commercial stations, almost all of them affiliated to one of the three networks.[11] Brazil has 4 non-commercial TV stations compared with 46 commercial stations, almost all of them affiliated to one of the four networks.[12] Despite all these similarities in ownership patterns, some attributes in this "key-dimension" do differentiate Brazilian and American mass media systems. In the U.S., the government regulations are very much weaker than in Brazil. In Brazil, a rigid "press law" controls abusive statements written by journalists and every subject dealing with critics against the government must be carefully written, if it is to be conveyed to the people. A federal commission (Servico de Censura do Departamento de Polícia Federal) determines at

what time each program may be broadcast by radio and TV. If this commission thinks that some program content is sensitive to young people, it has the power to summarily censor the program. The government also has the right to require some hours a day for the radio and TV stations to convey instructional programs (usually two hours a day) and one hour a day (only for radio stations) to convey laws and official matters. During electoral campaigns, radio and TV stations are obliged to furnish one hour a day for each of the two political parties to broadcast their ideas to the voters.

Finance

Both Brazil and the U.S. have their media systems operating in an advertisement based mode. Neither in Brazil nor in the U.S. there is any kind of license fees, general taxation or any hybrid system. Non-commercial radio and TV stations, of course, do not rely on advertisement: in the U.S. they are subsidied by the organizations above cited, and in Brazil, usually by the government. Newspapers have their revenues in both countries coming from advertisement and sale. Thus, concerning finance, American and Brazilian media are almost identical, except that the amount of money involved is, of course, very different.

Programming Goal

Under this dimension, the two systems are also very alike. According to UNESCO, about 70 percent of total output of television content in the U.S. is entertainment.[13] UNESCO's similar figures for Brazil[14] contrast sharply with those offered by Brazilian sources.[15] Figures provided by Brazilian sources in this specific case seem to be much more accurate. According to them, 53 percent of TV programming in Brazil is devoted to entertainment, 20 percent to publicity, 15 percent to information and 12 percent to education. The patterns for television are maintained for radio programming in both countries. Newspaper contents in Brazil and in the U.S. are mostly informative.

Target Audience

Wells divides this "key-dimension" into three possibilities: elite, mass, and specialized.[16] Media's goal, in Brazil as well as in the U.S., is to reach the maximum possible number of people. But while in the U.S. almost the whole population is actually reached, in Brazil many people do not have access to any medium. However, TV and radio are becoming more and more pervasive: in some areas of the country, the exposure patterns to mass media are the same as the American ones. According to the leading newspaper in Brazil, in the Greater São Paulo area, over 95 percent of all homes have at least one TV set,[17] the

same percentage of the whole U.S.[18] In that Brazilian area, the average citizen spends an average of three hours a day in front of a TV set,[19] the same amount of the average American.[20] In such areas of Brazil (almost every state capital and neighbor cities), it is possible to talk about a mass audience. Furthermore, some radio stations and some magazines in those areas have very specialized audiences, following the same trend observed in the U.S. But those areas do not have their patterns repeated all over Brazil. Maybe 40 percent of Brazilian people (those who live in the rural areas) do not have access to any mass medium, except the radio for most of them.[21] Newspaper audience in Brazil still may be classified as an elite.

Feedback Mechanisms

In the United States and in Brazil, polls and ratings are the most usual feedback channel for mass media. Audience participation is very limited in both countries. In Brazil, a special feedback system has been set for instructional programs, with exercises to be filled out by the students, reception groups, and examinations to test students' achievements.

Thus, it is possible to conclude that Brazilian and American media systems are very alike in many aspects, particularly when one takes in consideration some special areas of Brazil, such as the Greater São Paulo. The area of

Santos, in the State of Sao Paulo, may be put among those regions where the pattern of media usage is close to the American one.

The main differences are found in the "key-dimension" of control. Government pressures over media in Brazil are much larger than in the U.S. This fact may have important consequences for the conveyance of environmental information. Because of it, information which may be considered as "harmful" to government policies has a high possibility of not being conveyed to the audience. On the other hand, environmental information may enjoy the benefits of the government power of requiring some hours a day from broadcast station, if it is considered as educational matter.

But, in an overall view, it is reasonable to say that environmental affairs information neither suffers any particular damage nor enjoys any special benefit due to the peculiarities of Brazilian media system in any "key-dimension," at least until now.

Comparing Santos and San Francisco

In order to make easier the comprehension of the particular situation which will be exposed in the next pages, it may be useful to compare the city of Santos, Brazil, where the primary data were collected for this work with the city of San Francisco, where many similar environmental problems have been occurring.

Table 1.--Comparative Figures Between Brazilian and American Media.

	U.S.A.	Brazil
Population	208,840,000	98,850,000[a]
Area	9,362,353 sq.km.	8,511,965 sq.km.
Daily newspapers	1761	261
Non-daily newspapers	10,100	730[b]
Total circulation	65,510,000	3,498,000
Copies per 1,000	314	35
Radio stations	4367	945[c]
Radio receivers	354,000,000	5,700,000[d]
Sets per 1,000	1625	58[d]
TV transmitters	3695[g]	50[e]
TV receivers	98,600,000	6,500,000[f]
Sets per 1,000	472	66[f]

SOURCE: UNESCO, World Communications: A 200 Country Survey of Press, Radio, Television and Film (Paris: UNESCO Press, 1975).

[a]According to the 1974 Annuary of the Instituto Brasileiro de Geografia e Estatística, Brazilian population in 1974 was close to 110,000,000.

[b]According to the same Annuary, there were 1084 non-daily newspapers in Brazil and 274 daily newspapers, in 1972.

[c]According to the same Annuary, in 1972 there were 1004 radio stations in Brazil. According to Pedro Paulo W. Leone Ramos, from Brazilian Ministry of Communications, in an interview of VEJA magazine (November 19, 1975, p. 89), there were 1,800 radio stations in Brazil in 1975.

[d]Although the author has no other source to contradict this figure, it seems impossible that there may be less radio receivers than TV receivers in Brazil. Any empirical observation will lead to the conclusion that the figure must be much larger than this, especially if one counts transister receivers.

[e]According to the 1974 Annuary of Instituto Brasileiro de Geografia e Estatística, in 1972 there were 63 TV stations.

[f]According to O Estado de São Paulo (March 14, 1976, p. 46), there are 10,000,000 TV receivers in Brazil nowadays.

[g]Including 1915 VHF and 865 UHF television translators at 1 July 1975.

Both Santos and San Francisco have had pollution problems in the last few years. But there are many differences between them. Santos has a population of about 400,000 people.[22] San Francisco has 675,600 inhabitants.[23] However, both the cities are the center of a larger region. The metropolitan area of San Francisco population is 3,755,000.[24] There is no official "metropolitan area" of Santos. But there is an aggregate of cities known as "Baixada Santista," composed by São Vicente, Guarujá, Cubatão, Praia Grande, Itanhanhém, Mongaguá and Peruíbe, whose center is Santos. The population of this area is 766,551 people.[25]

San Francisco has some air pollution problems of its own. Santos does not. Santos' air pollution problems come from the city of Cubatão, one of the industrial centers of the State of Sao Paulo, the most developed State of Brazil. Santos' own environmental problems are exclusively of sea pollution. But many people are concerned about the possible effects of the air pollution carried from Cubatão ("the best laboratory in the world to study the consequences of pollution," in the words of an expert from the World Health Organization[26]) by the action of the winds.

As far as mass media are concerned, the differences between Santos and San Francisco are enlarged. San Francisco has two daily newspapers[27] and so does Santos. However, the San Francisco Bay Area is served by 28 daily newspapers, with a total circulation of 1.6 million issues

a day.[28] The area of Santos is served by other 13 newspapers (edited in São Paulo) and by two weekly newspapers, but their circulation is much smaller than in San Francisco, although precise data are not available (most newspapers in Brazil do not make public their circulation). San Francisco has 67 radio and TV stations.[29] Santos has 7 radio stations, but the area is served by other 14 radio stations and 6 TV stations from São Paulo.

The most important differences, however, are to be found in what refers to public environmental awareness. Just three organizations in San Francisco have almost 50,000 people affiliated to them: Sierra Club, with 39,000; Save Our Bay Action Committee, with 7,000 and Committee for Green Foothills, with 3,000.[30] Other conservationist groups have also great number of members. In the whole area of Baixada Santista, there are only two groups of people who commit themselves to environmental causes: Centro de Estudos Ecológicos, in Santos, and Sociedade de Ecologia, Cultura e Turismo, in Itanhaém. Neither of them has more than 20 active members. While in San Francisco, citizens seem to be actually aware of the problems and ready to act when necessary to protect their environment, in the Baixada Santista area this is still far to be true. Recently, when one of the beaches in that area was closed down by the authorities because of the pollution, as it will be shown in sections ahead, a research found that only

10 percent of a sample of 250 women knew about the fact and had warned their children not to go to the beach.[31]

This apparent lack of awareness among the population of the Baixada Santisat area was one of the reasons why this work was designed. It was thought that it would be interesting to find out what role mass media perform in a situation in which people in a given community are just beginning to be conscious of the environmental problems. Still apparently, there is no such community in the U.S. nowadays.

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CHAPTER IX

BACKGROUND OF THE SITUATION

A short background of the problems related to environmental affairs in Brazil and particularly in the Santos and Baixada Santista area will be presented in this section. The sources of the information to be conveyed here are newspapers and magazines edited in Brazil.

The Brazilian Situation

In Brazil, as in almost every country in the world, neither ecology nor environment were words enjoying large popularity before the last years of the 1960 decade. This lack of knowledge about ecological problems was probably larger in Brazil, where the industrialization process began to be really important just after World War II.

Maybe the first law dealing with environmental deterioration was the one made in 1951, in the State of Sao Paulo, which has always been the most industrialized in Brazil. That law (Law #1561 A) dealt with the control of water pollution in the State.[1]

The first public official to warn people about the pollution menace was probably São Paulo State Health

Secretary Archimedes Lamaglia, who in 1964 claimed that the city of São Paulo was the most polluted in the world and that some action should be taken to solve the problem urgently.[2]

In 1970, still in the State of São Paulo, the first governmental agency to take care of pollution problems was created: Superintêndencia de Saneamento Ambiental (Superintendency for Environmental Sanity)--SUSAM.[3] This would become a very much known agency in the following years because of its daily announcements of air pollution levels in the city of São Paulo.

In spite of these signs of concern in the State of São Paulo, the attitude of the federal government in Brazil was very anti-environmentalist in the beginning of the 1970 decade. During the world conference on the environment sponsored by the United Nations in 1972 in Stockholm, the Brazilian delegation led by Minister Costa Cavalcanti denounced "a plot organized by the rich countries against the developing countries on the ground of environmental protection."[4] Costa Cavalcanti said in Stockolm" "Those countries who have not reached yet a satisfactory economic level enough to meet the minimal demands should not deviate great amounts of resources to protect the environment."[5]

The position held by the Brazilian delegation in Stockolm obviously displeased the few environmentalists in Brazil. One of them, Professor Piquet Carneiro answered to Costa Cavalcanti in this way: "Of course, there is an

urgent need to cope with the acute social problems. But there is no dichotomy between development and environmental quality."[6]

Two interviews by one of those few environmentalists, landscape architect Roberto Burle Marx, printed by magazine VEJA in 1973, may be considered as a landmark in the history of Brazilian environmentalist movement. Burle Marx, "the first, most respectable, and for years the lonely Ecology preacher in this country,"[7] denounced strongly the forest destructions in Brazil and claimed that "we need to reformulate our concept of patriotism. Patriotism, in my opinion, is to protect our heritage, our artistic heritage, our cultural heritage, and the land that gives us all this."[8] Though enthusiastic, Burle Marx acknowledged the problems he would have ahead: "It is very difficult to teach new concepts, to change mentalities."[9]

Many factors, among them the always increasing air pollution levels in the city of São Paulo, led to a larger concern among the population and the government, at the end of 1973 and the beginning of 1974. A new President of the Republic, Ernesto Geisel, only a few weeks after taking office, created a federal agency to deal with environmental problems: Secretaria Especial do Meio Ambiente (Special Secretary for the Environment)--SEMA.[10]

President Geisel appointed zoologist Paulo Nogueira Neto to lead the new agency. Nogueira Neto had been committed to the protection of nature in Brazil for 26

years when he was chosen to command SEMA.[11] Despite his idealism and efforts, he has not been able to accomplish great victories, partly because his agency has not been provided with enough money and partly because there are still many people in the government who agree with Costa Cavalcanti's Stockolm arguments. Even so, skillfully and diplomatically, Nogueira Neto has achieved some improvements for Brazilian environment.[12] One of his first problems was the pollution of Santos' beaches which will be showed ahead in this work.

During the year of 1975, many events helped to enlarge public awareness about ecological matters. In March, Carlos Alberto Dayrell, a 21-year-old college student climbed a tree in Porto Alegre, on the day the tree was scheduled to be cut down to open way for a new avenue. During hours, hundreds of people surrounded the tree, supporting Dayrell and two other students who followed him. After negotiations with public officials, and having been assured that the tree would not be cut down any more, Dayrell and his friends left the tree and were arrested for "disturbing the peace." Paulo Nogueira Neto supported their action and after 24 hours, they were free. The tree was not cut down.[13]

The Porto Alegre incident had national repercussion. Ecology began to be a known word. In April, a ship from Finland intended to drop seven tons of arsenic in Brazilian oceanic waters. A strong public reaction and

government action obstructed that attempt and stirred new concern about ecological hazards.[14]

Still in April, an Iraquian tanker (the "Tarik Ibn Ziyad") poured out 20,000 tons of oil in the coast of Rio de Janeiro. Thousands of birds were killed, burnings happened on the sea surface, the water was contaminated, and public awareness was once again stirred up.[15]

In June, the worst case of air pollution happened in the Greater São Paulo area. A thermic inversion caused the fall of a gross smong over large regions of São Paulo and Santo André, a neighbor city. People left their houses in panic, many children had to go to hospitals, many domestic birds died.[16] After that, public concern, at least in São Paulo, reached its highest level. Newspapers began to demand effective legislation to finish with the problem.[17]

In August, an Environment Act was sent to the State Legislature in Sao Paulo.[18] In the same month, President Geisel established a decree to regulate factories' activities which may be harmful to public health.[19]

However, laws have to be enforced and this is more difficult than making them. Pollution levels kept going up during the months following the publication of the new laws. In April 1976, public officials in the State of São Paulo conceded that it may be needed to evacuate the population of Capuava, a city in the Greater São Paulo area, if the air pollution there does not decrease soon.[20]

Water pollution is killing some rivers in the State of São Paulo, despite public claims against the factories that have been throwing chemical materials into them.[21]

Recently, SEMA's leader Paulo Nogueira Neto expressed his fears that in 25 years the Amazonian forests will probably be completely destroyed if their devastation is not halted soon.[22] São Paulo Environment Secretary Fernando de Barros fears that in 1978 the level of sulphur dioxide in the air of that city will reach a critical level.[23]

However, all these predictions perhaps will not take place if public reaction is strong enough. At least one condition for this to happen seems to be fulfilled: people already know about pollution. A Gallop Institute survey taken in the city of Sao Paulo in October 1975 showed that 80 percent of the sample ranked pollution as one of the most important problems of their lives, more important than the cost of living and safety on the streets.[24]

The Problem of Santos

The pollution problem in Santos is certainly not a new one. But it was only after April 1974 that it became widely recognized and began to stir up public interest. In that month, Paulo Nogueira Neto, who had just been appointed to command the brand new federal agency for environment, SEMA, claimed that Santos' beaches were so badly polluted that he would demand their interdiction

during two years in behalf of public health. Santos mayor Antonio Manoel de Carvalho immediately responded that there was no such grave problem in his city.[25] That was the starting point of a long debate.

According to the American Water Works Association, the maximum allowable amount of coliform organisms to be found in the water is 1,000 units per 100 mm of water intended for public recreation.[26] According to Jornal da Tarde, a respectable Sao Paulo daily newspaper, in Santos one can find even 15,000 units per 100 mm of water intended for public recreation.[27] Coliform organisms may cause a large series of illnesses, such as summer fever, paralysis, respiratory and ocular diseases, hepatitis, skin diseases, intestinal diseases, among others.[28]

The causes for sea pollution in Santos are manyfold: 84 cubic meters of sewage are carried every second through sewage drains from Billings Dam, where most of São Paulo's sewers deposit their waste; the waste from petrochemical factories in Cubatão are also carried to the sea through rivers; ships which operate at the harbor of Santos (the largest and most important in Latin America) usually throw away oil, detergent, and chemical products into the sea; clandestine sewage drains carry a great amount of waste from many Santos' houses directly to the sea.[29]

Besides the sea pollution, Santos also has some air pollution problems carried by wind from Cubatão, but this is not so serious a problem for the city.[30]

It happens that Santos is a resort area. Ten million tourists a year go to the city and leave there huge amounts of money. The city has 200 restaurants, 1400 bars, tens of hotels.[31] If its beaches were to be interdicted, Santos would be in a real trouble.

Thus, in May 1974, the interdiction plan seemed forgotten. Santos' mayor, businessmen, and political leaders denounced "an insidious plot against the city."[32] State public officials from Santos also denied the charges of pollution, such as Colonel Antonio Erasmo Dias, State Secretary for Public Security: "The waters may be a little dirty, but that is perfectly normal."[33] SEMA's Paulo Nogueira Neto simply said that his agency did not have "material conditions to interdict large areas of the coast."[34]

Instead of prohibiting people to go to the beaches, SEMA decided to establish criteria to assess the quality of each beach and make public its assessments every week, advising people to not go to those beaches classified as being in "bad quality."[35] Nogueira Neto justified his decision with these words: "Disclosing the pollution levels may lead public officials to hurry their sanitation plans. We had two options: not reveal the situation for not causing damages to tourism and allow our children to play in dirty beaches, or to warn the public about the real situation, stirring the demands for fast sanitation works."[36] In December 1974, Nogueira Neto said that

interdictions would be a state-wide problem, not a federal one, and the problem seemed to be finished.[37]

However, in December 1975, Nogueria Neto repeated his charges of high levels of pollution in Santos' beaches[38] and in January asked people to avoid going to those beaches.[39] Summer in Brazil begins in December and lasts until February. That is the best part of the year for tourism in Santos. Thus, reactions from businessmen and from municipal authorities were, once again, strong and immediate.[40]

This time, however, the mayor of São Vicente, Jorge Bierrembach Senra, acknowledged the existence of pollution in his city's beaches.[41] He ordered that warnings asking people to avoid going into the sea were put on the beaches.[42] Physicians from Santos also conceded that there was a health risk to those people who played in the polluted waters.[43] However, in spite of all warnings, the beaches continued being completely crowded everyday.[44] The public ignored the appeals.

On January 20, São Paulo Governor Paulo Egydio Martins stated officially that there was a pollution problem in Santos and São Vicente: "Only those who do not want to see can say that there is not pollution here. One does not need laboratory tests to recognize the problem."[45] Governor Egydio Martins vowed that the necessary sanitation works to solve the problem would be concluded at the end of 1976.[46]

But before that, the problem reached a so urgent level that one beach in São Vicente had to be actually interdicted. On February 27, 1976, it was proved through laboratory tests that there were 790,000 units of coliform organisms per 100 mm of water intended for public recreation in the beach named "Gonzaguinha," one of the most popular in São Vicente, some three miles close to Santos.[47]

São Vicente mayor Jorge Bierrembach Senra interdicted Gonzaguinha, but hundreds of people kept bathing themselves in the polluted sea.[48] On March 13, Senra ordered that ropes were put to stop people from going into the sea.[49] Some people cut the ropes during one night, while many Sao Vicente businessmen protested against Senra.[50] Finally, the mayor decided to use policemen to maintain the public far from Gonzaguinha. Those people who did not accept the order would be arrested.[51]

Once again, the State government promised to solve the problem very soon, and the people from Santos and São Vicente, as well as the tourists, waited for that.

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[49]"Esta Praia É Proibida," A Tribuna (Santos), 12 March 1976.

[50]"Cortadas as Cordas no Gonzaguinha," A Tribuna (Santos), 15 March 1976, p. 1.

[51]"Agora, Toda a Faiza de Areia Está Interditada," A Tribuna (Santos), 16 March 1976.

CHAPTER X

HYPOTHESES AND SURVEY METHODS

This work was designed under the assumption that mass media do perform an important role in the process of public awareness about environmental problems. It was supposed that such awareness is just beginning to occur among the population of Santos and its neighboring cities, due to the increasing problems of air and water pollution which have been harassing people in that area for the last few years (as shown in the former section).

Based on prior findings in the United States, three broad hypotheses were formulated:

1. The first warning about environmental hazards are more likely to come from mass media than from any other source for most of the people. Mass media continue being the most important source of knowledge about environmental affairs for most of the people after that first warning. Mass media are also the main attitude shaper, particularly in countries such as Brazil, where the audience does not hold strong positions about these problems yet. Printed

media seem to perform a more important role than electronic media both as source of information and attitude shaper.

2. The public would like to have more information concerning local problems, and more specific instructions about how to act in order to solve environmental hazards. Mass media fail in furnishing to the public these kinds of information. Further, media managers do not hold a special concern about the subject and ordinarily do not rank environmental affairs at high levels of importance when compared with other issues. Mass media information does not engage the audience in active participation.

3. People tend to have a favorable attitude toward environment, but they do not feel like changing their set of patterns for the sake of contributing for the solution of problems. They are not likely to go against their vested interests because of environmental quality. Most people believe the environmental problems are important, but not too much when compared with other more personal questions. They tend to feel their participation to solve problems as useless. They tend to see environmental problems as distant in the space.

If the assumption formulated in hypothesis one, that mass media are the most important knowledge source and attitude shaper concerned with environmental affairs, is correct then it will be reasonable to assume that the whole set of attitudes described in hypothesis three is largely influenced by mass media information.

In order to test the hypotheses, four instruments were designed. They will be more specifically described in the sections ahead, but here will be given a short summary of them.

During the month of March 1976 (the month was randomly chosen), Santos' two daily newspapers, two São Paulo newspapers which have large public in the Baixada Santista area and three TV stations were monitored in order to assess the information conveyed by them about environmental problems. The quantity and content analyses of this material was supposed to furnish a valuable picture of how mass media deal with environmental affairs in that specific area.

The second instrument was a questionnaire to media managers. All of the media located in Santos had one of their managers personally interviewed. Mail questionnaires were sent to the managers of five newspapers, five television stations, and seven radio stations, all of them located in São Paulo, but with large audiences in the Baixada Santista area. This instrument was supposed to reveal media managers' attitudes and concern on environmental problems, their criteria when dealing with environmental information and how media are prepared to deal with this information.

Finally, a cross-sectional survey with parallel samples was designed and carried out. Two different questionnaires were used. The first one was given to the

participants of a seminar about ecological problems held in Santos on December 13 through 19, 1975. This sample was supposed to show what those people already interested on environmental affairs think about the various problems involved in this work.

The second questionnaire was applied to a 300 subject sample through personal interviews. This survey was conducted by the Centro de Pesquisas Aplicadas em Comunicacão (Center For Applied Researchs in Communication) --CEPAC--organization linked to the Communication College of Santos. The subjects were chosen through a multistage area sampling. They were drawn mainly from Santos, but also from São Vicente and Cubatão, two cities which are very close to Santos and share with it almost all of its environmental problems.

CHAPTER XI

MONITORING THE MEDIA

In order to assess the quantity and the content of environmental information conveyed to the public, it was decided that some mass media would be monitored during the period of one month. The month chosen was the one of March. There was no special reason to choose March, but this seemed to be a convenient month because the data collected in Brazil would be available in time to be used for this work. March also seemed to be better than January or February because summertime would be already over in Brazil and the cities of Santos and São Vicente would be living their normal activities rather than the agitated months of summer, when the population of those cities is increased twice or three times by the tourists.

However, March 1976 happened to be a very atypical month as far as environmental news is concerned. On February 27, by the first time in the country, a beach had to be interdicted to the public because of pollution. The beach was the one called Gonzaguinha, in São Vicente. Of course, the Gonzaguinha interdiction was transformed into

the great subject for the media during the whole month of March, while the events concerning the Gonzaguinha affair succeeded each other everyday.

Thus, the data presented in this section must be viewed with double caution. The amount of environmental news conveyed in March 1976 through the media monitored in Santos probably is not representative of the average amount, because in that specific month an unique event took place in the same area where the monitored media are located.

Defining the term "environment" is a difficult task, as it has been already pointed out by Rubin and Sachs.[1] They decided for their purpose to restrict the term to five areas: air quality, water quality, human population explosion and control, environmental additives, and the management of energy-producing resources.[2]

For this study, the term "environment" was also restricted to five areas, but not exactly those used by Rubin and Sachs. Air quality, water quality, and human population explosion were considered adequate, but it seemed to be more advisable to change the last two areas for the case study in Santos. Both public and media seem to be more sensitive regarding the problem of lackness of green areas in Brazilian cities than the problem of environmental additives. So, the problem of green areas in cities was the fourth dimension to define environmental news in this work. The fifth was wildlife destruction (including

forests and trees), which seems to be a major ecological problem in Brazil and not in the United States.

Thus, any news conveyed through the media chosen to be monitored dealing with any of those five areas (air quality, water quality, human population explosion and control, green areas in cities and wildlife destruction) was considered "environmental news."

Newspapers

Four daily newspapers were chosen to be monitored: the two Santos daily newspapers (A Tribuna and Cidade de Santos) and two São Paulo daily newspapers which enjoy relatively large audiences in the Santos area (Diário da Noite and Jornal de Tarde).

It was found that a relatively large amount of news dealing with environmental affairs was printed in all the four monitored newspapers. Not only there was the Gonzaguinha affair to cause this large amount of news, but also a grave case of pollution in the Mogi Guacu River, in the Greater São Paulo area.

These are the figures found out and, as a measure of comparison, the figures found by Rubin and Sachs in their monitoring of the San Francisco Cronicle for the whole year of 1970, which they considered a landmark year in the "environmental information explosion."

Table 2.--Column Inches of Environmental News Printed in Four Brazilian Newspapers in March 1976 and in the San Francisco Chronicle in the Whole Year of 1970.

Cidade de Santos	441.0
A Tribuna	2053.0
Jornal da Tarde	3077.0
Diario da Noite	790.0
Chronicle	616.0

Thus, three out of four of the monitored papers for this work printed more environmental news in one month than the San Francisco Chronicle did during the whole year of 1970. Almost the same pattern will be noted in the average per issue of column inches measurement.

Table 3.--Average Per Issue of Column Inches of Environmental News Printed in Four Brazilian Newspapers (March 1976) and the San Francisco Chronicle (1970).

Cidade de Santos	14.0
A Tribuna	66.0
Jornal da Tarde	99.0
Diario da Noite	25.0
Chronicle	1.68

However, when one breaks up the amount of news printed in the four Brazilian papers in March 1976, the influence of the Gonzaguinha event is noted very rapidly, in particular for the Santos' newspapers.

Table 4.--Total of Column Inches of Environmental News Printed in Four Brazilian Newspapers and Total Dedicated to the "Gonzaguinha Event."

	Total	Gonzahuinha
Cidade de Santos	441.0	259.0
A Tribuna	2053.0	1237.0
Jornal da Tarde	3077.0	585.0
Diario da Noite	790.0	199.0

The São Paulo newspapers (Jornal da Tarde and Diário da Noite) also dedicated much of their column inches to the "Mogi Guacu River event" which was also atypical. Thus, Diário da Noite gave 206 column inches to the Mogi Guacu River problem, and Jornal da Tarde, 454. This way, one can conclude that 50 percent of the news printed in the four newspapers was due to non-normal events. It seems fair to suppose that in a more typical month, the amount of environmental news would be, at least reduced in a half compared with the amount in March 1976. For the Santos' newspapers, the figures were even higher. About 60 percent of the environmental news was due to the Gonzaguinha event in March 1976.

Another indicator of how atypical was the month of March 1976 is given by the comparison of the average of articles of environmental news per issue printed in the four Brazilian papers and in the San Francisco Chronicle. The pattern depicted before does not appear here, what

suggests that the Brazilian newspapers printed very long articles of environmental news during March 1976, what is usual in situations of crisis.

Table 5.--Average of Articles of Environmental News Per Issue in Four Brazilian Newspapers (March 1976) and the San Francisco Chronicle (1970).

Cidade de Santos	0.6
A Tribuna	1.03
Jornal da Tarde	1.05
Diario da Noite	0.6
Chronicle	3.17

Again, the number of articles about Gonzaguinha is about 60 percent of the total number for the Santos' newspapers and 25 percent for the São Paulo's newspapers. For the São Paulo's newspapers, the number of articles about the Mogi Guacu River is also about 25 percent of the total number, making a total of 50 percent of news about critical and non-usual events.

In order to analyze the content of environmental news conveyed through the four monitored newspapers in March 1976, some dimensions were established: the type of article (if plain news, opinionative or interpretative), the location in the paper (if on the front page, last page or internal pages), the procedence (if written by the local staff, correspondents or wire services), the thematic (if the article is about a local, regional, national or

international problem), if the article just shows the problems or if it also gives suggestions to solve them, and if there is much quantification or not (see page 29).

It was found that almost all environmental information conveyed by the four monitored newspapers during March 1976 was constituted of plain news. In a total of 107 articles, only ten were opinionative (three editorials and seven commentaries) and nine were interpretative, or investigative reports. This lack of investigative reports may be confirming the assumption that environmental news makes more unlikely for the reporter to perform the "watchdog role" of the press (see pp. 21 and 42).

It was also found a relatively large number of front page stories, what may also be attributed to the Gonzaguinha and Mogi Guacu crises.

Local staff and sucursals seem to be the main sources for the monitored newspapers, as far as environmental information is concerned. Only four stories written by some wire service were found out of a total 107.

The "Afghanistanism problem" (see p. 37) was not found in the monitored newspapers. The majority of the stories printed by them referred to some local or regional problem. However, this may be also an effect of the Gonzaguinha and the Mogi Guacu crises.

The vast majority of the articles did not offer any kind of solution to the problems they were dealing with.

Only seven stories suggested some sort of solution, in a total of 107. This may lead to the "syndrome of well informed futility" (see p. 39).

The quantification problem (described on p. 29) does not seem to constitute one in the monitored newspapers. Very few articles (only 20) showed some significative quantifications.

Finally, some symptoms of the "home-team" problems (see p. 35) were found in the Santos' newspapers, but not very much, as it had happened during 1974, when the first charges of pollution were made against Santos (see p. 149).

Informations were fairly conveyed by both the Santos' newspapers and the slight "home-team" symptoms could be observed on the way the headlines were written: while São Paulo newspapers tended to emphasize the most sensational aspect of the news, the Santos' ones tried to show a better aspect. The best example was observed not in March, but on January 20, the day after the one on which São Paulo Governor Paulo Egydio stated that there was, indeed, pollution problems in Santos and São Vicente and that his government would try to solve them very soon. Jornal da Tarde's headline for that story was: "This is the end of the debate among Baixada Santista's mayors: Paulo Egydio says that the pollution exists." A Tribuna headline was: "Egydio assures sanitation works by December."

Television

Three television channels had their newscasts monitored during the month of March 1976 in order to assess their information about environmental affairs: Channel 2, Channel 4, and Channel 5. Channel 2 is a non-commercial station, owned by the State government and with educational purposes. Channels 5 and 4 are the two most watched ones in the whole State, both of them (as well as Channel 2) located in the city of São Paulo.

The same effects observed in the newspapers concerning the pervasiveness of news dealing with the Gonzaguinha and the Mogi Guacu issues were found in the television newscasts. A total of 33 stories about environmental problems were broadcast by the three stations in March 1976: 11 about Gonzaguinha, 7 about Mogi, 10 about the city of São Paulo, 4 about national problems, and one about the inland city of Embu.

The 33 stories ran a total of 46 minutes of information. That gives an average of 1.05 per day for the three stations together, what does not seem very much. Channel 2 was the one which conveyed most information (19 minutes and a half, with an average of 0.6 per day). Channel 5 conveyed 15 minutes and a half (average of 0.5 per day), and Channel 4 conveyed 11 minutes (average of 0.3 per day).

REFERENCES

[1]Rubin and Sachs, Mass Media and Environment, p. 55.

[2]Ibid.

CHAPTER XII

THE MEDIA MANAGERS

The questionnaire used to assess media manager's attitudes and professional criteria toward environmental information was answered in a so vague fashion (or just not answered at all) that will not be very useful, except to prove that media managers have no special concern about environmental affairs, which is one of the statements of hypothesis 2.

A questionnaire with fifteen questions (thirteen of them demanding for open answers) was designed for media managers to answer. Almost the whole questionnaire had open answers because it was hoped that media managers could offer some insightful observations which might improve the work. Apparently, their capacity was overestimated.

From seventeen mail questionnaires sent to Sao Paulo media managers (5 newspapers, 5 TV stations, and 7 radio stations), only two were answered. For Santos media managers, personal interviews were conducted, but the result was not much better because the answers were, generally, so vague that very little information can be learned from them.

In the total, six newspaper managers (2 Santos daily, 2 Santos weekly and 2 São Paulo daily) and five radio managers (all of them located in Santos) answered the questionnaires.

By managers, it is meant editors or any other people in a position of command in the media and who could answer in their name.

Newspaper managers answered unanimously that: their newspapers do not have special beats to deal with environmental affairs; they do not have any specified editorial policy about environmental problems; they accept advertisements paid by polluters; they do not have any kind of linkage with environmental organizations with the objective of giving orientation to the public.

Two of them did not rank a list of ten subjects (among them environment). The four who did it put environment in an average position (one ranked it at the tenth place, one at the second and two at the fifth). All of them uttered a positive but vaguely defined personal attitude toward environment.

Five of them said that their newspapers' position about who must pay for pollution damages is that everybody does. Only one said the government does and nobody answered that the industries do.

Two of the newspapers' managers did not cite an example of a news which they would put on the front page, relating to environmental affairs. Two said that a big

ecological disaster would deserve the main front-page headline and the other two cited the destruction of forests in areas close to Santos.

Asked about what had been the most important news about environment that their newspapers had printed in the last six months, three answered the Gonzaguinha beach interdiction, two answered the forest destructions during the construction of the Rio de Janaeiro-Santos roadway, and one did not answer.

In spite of the vagueness of their answers, it is possible to conclude that neither those who answered nor the organizations they represent have a deep concern about their mission in the struggle for a better human environment.

The same can be safely said about the radio managers who were interviewed. Their answers were very much alike to those of their newspaper colleagues.

Among the few differences: two among the five ranked environment as the least important subject in the list of ten and one ranked as the second most important (two did not answer). One of them believes the industries must pay for the environmental dmages caused by their pollution, but the others think everybody has to pay for that.

All the other answers were identical to those given by newspapers' managers.

According to this survey it is possible to say that, at least as far as Santos is concerned, media

managers do not have a special concern about environmental affairs. As some of them did not rank the ten subjects listed, it is not possible to state that they have environmental affairs in a low position based on their feedback.

Thus, from the two statements of hypothesis 2 which should be tested by this instrument ("media managers do not hold a special concern about the subject" and "they ordinarily do not rank environmental affairs at high levels of importance when compared with other issues"), one of them can be supported as far as Santos is concerned, though there is not enough information about São Paulo, and the second statement cannot be supported or rejected for a lack of evidence.

CHAPTER XIII

A SURVEY AMONG THOSE ALREADY AWARE

Centro de Estudos Ecológicos (Center for Ecological Studies)--CESEC--is an organization founded on June 5, 1974, in Santos. It was founded by five persons and during most of its life has had very few active members. However, CESEC's first important promotion, a Seminar about environmental problem in November 1974, was able to attract more than 120 people to attend a series of seven lectures and discussion sessions.

In December 1975, a second seminar sponsored by CESEC was carried out. This time, the number of attendants was not so large. Only forty-five people were present at most of the lectures. Among them, a questionnaire was distributed to be answered and turned back. The questionnaire was intended to assess attitudes toward environmental problems and environmental news as conveyed through mass media, sources of environmental information, media exposure patterns, and media appreciation among those people who already were aware of environmental problems. That

awareness was assumed by the fact that those people who attended the Seminar did so because they were worried about environmental problems.

Thirty-six questionnaires were turned back. The relatively small number may reduce the significance of the survey. But the very fact that less people attended CESEC's seminar in 1975 than in 1974 may be related to media effects, although other reasons (such as a worse organization of the seminar) may also have influenced the attendance turn-out. The fact that in October and November 1974 the mass media were paying attention to some environmental controversies which were occurring in Santos may be one of the reasons why so many people attended the seminar in 1974. The absence of such kind of controversies in November and December 1975 may also have contributed for the smaller attendance turn-out.

Those people who responded to the questionnaires for this survey were very alike to the typical environmentalist described in prior American research (see p. 86): 47.2 percent of them had college education, 33.3 percent high-school education, 16.7 percent secondary education and only 2.8 percent primary education; 47.2 percent were between 15 and 20 years old, 22.2 percent between 20 and 25 years old, 16.7 percent between 25 and 30 years old, 8.3 percent between 10 and 15 years old (a group of Boy Scouts attended the seminar), 2.8 percent between 30 and 35 years old and 2.8 percent above 30 years old.

A media failure was found just in the first question of the survey: only 11.1 percent of the respondents had attended the seminar because they had read about it in the newspapers. On the other hand, interpersonal sources seem to have been very successful: 30.6 percent were attracted by friends, 8.3 percent by teachers, 13.9 by invitation of CESEC's members. Other 36.2 percent were attracted by outdoors and banners.

The reasons why those people went to the seminar: 50 percent looked for plans of action to help solving environmental problems, 22.2 percent looked for more scientific information, 16.7 percent wanted to know the causes of environmental problems and 11.1 percent said they intended to acquire "more knowledge" by attending the seminar.

The respondents were asked to rank (no important at all, relatively important, important, and very important) nine mass and interpersonal sources of information and opinion on environmental affairs. The results are listed in Table 6 and 7.

As it may be noted, interpersonal sources (lectures, classes, and seminars) seem to be more important both as information and opinion sources for those people who attended CESEC's seminar. The very fact that a high percentage of them is constituted of students may explain this fact. Despite that, 47 percent considers television a "very important" source for their opinion on environmental

Table 6.--Sources of Opinion on Environmental Affairs, as Ranked by the Attendance of CESEC's Seminar.

	Not Important	Rel. Important	Important	Very Important
Television	2.9%	17.6%	32.4%	47.0%
Santos papers	32.4%	32.4%	20.5%	14.7%
SP papers	8.8%	17.6%	41.2%	32.4%
Magazines	20.5%	29.4%	26.5%	23.5%
Radio	35.3%	35.3%	17.6%	11.8%
Seminars	2.9%	20.5%	41.7%	47.1%
Lectures	8.8%	5.9%	23.5%	61.8%
Friends	17.6%	35.3%	17.6%	29.3%

Table 7.--Sources of Information on Environmental Affairs, as Ranked by the Attendants of CESEC's Seminar.

	Not Important	Rel. Important	Important	Very Important
Television	2.9%	14.7%	29.4%	52.9%
Santos papers	26.5%	32.4%	14.7%	26.5%
SP papers	17.6%	8.8%	35.3%	38.3%
Magazines	20.6%	20.6%	26.5%	32.4%
Radio	41.2%	20.6%	23.5%	14.7%
Seminars	8.8%	2.8%	14.7%	74.5%
Classes	29.4%	2.9%	23.5%	44.1%
Lectures	5.9%	5.9%	17.6%	70.6%
Friends	23.5%	32.4%	23.5%	20.6%

affairs and 52.9 percent for their information on them. It is important to point out that television is the most trusted mass medium for information as well as opinion. Sao Paulo newspapers come in second. It is surprising how distrustful for this group of people Santos newspapers seem to be. Not so surprising is the lack of confidence on radio, that in Santos does not perform a very important role as information source when compared with television.

The findings shown in Table 6 and 7 seem to contradict, at least as far as this specific group is concerned, the predictions that mass media are the main source of information and attitude shaper on environmental affairs, and that printed media are more important than electronic ones (all of them stated in hypothesis one).

However, the prediction that the first warning about environmental matters come from mass media was confirmed by this survey: 25.7 percent of the respondents said they were by the first time concerned about environment after watching a television program or newscast; 14.3 percent after reading a newspaper article; 5.7 percent after reading a magazine article. But talking to other people was a more important awareness source than both newspapers and magazines: 25.0 percent reported to it in this survey. Finally, 20.0 percent referred to a book and 8.3 percent to a lecture. At the total, 45.7 percent were first warned by mass media, 33.3 percent by interpersonal

communication channels and 20.0 percent by books (which may be considered as a mass medium, but are not usually seen as one).

Other predictions confirmed by this survey are those stated in hypothesis two: mass media have failed to give to the public the kind of environmental information people most desire (local information and instructions about how to act to help solve the problems).

Asked to state how they appreciated media coverage on environmental affairs, only 2.8 percent of the respondents said they thought it was "very good," and 11.1 percent that it was "good." A majority of 58.3 percent classified the coverage as "weak" and 27.8 percent said it was "bad." When they were demanded to offer suggestions which they thought would be likely to improve media's performance, 77.8 percent asked for "more information instructing the public about how to act to solve problems," 8.3 percent asked for "more local information," 8.3 percent for more "scientific information," 2.8 percent for a "larger amount of information," and 2.8 percent for "more world-wide information."

In order to assess how the statement that "people tend to see environmental problems as distant in the space" applied for this specific group of people, the respondents were given a list of eight environmental problems, ranging from Santos to world-wide dimension, and were asked to choose the one they judged as the most

important. A majority of 36.1 percent picked up the topic "world-wide pollution," followed by 19.4 percent who chose the other pole of the spectrum, the issue "sea pollution in Santos"; 16.7 percent thought the Billings Dam problem was the most important in the list and 11.1 percent chose "population explosion in the world." Other 11.1 percent preferred "pollution in the rivers all over Brazil," 2.8 percent picked up the topic "air pollution in São Paulo," and 2.8 percent the issue "sea pollution all over the world." No one chose "air pollution in Cubatão." In spite of the fact that this was a special group of concerned people, distant problems were considered the most important by a majority (exactly 50.0% chose some world-wide problem, and 13.9% chose a national problem far from Santos), although a relatively high percentage of respondents picked up two issues directly linked to their communities (36.1%).

To compare the importance of environmental subjects when put beside of other problems, the respondents were asked to rank from one to ten a list of ten relevant issues. Depicting their student condition, 27.6 percent of the respondents ranked "the quality of education in Brazil" as the most important topic in the list. Twenty-five percent chose "local economy," 24.1 percent preferred "the national environment," 17.2 percent cited "the national economy" and 11.1 percent picked up "the local environment." Thus, it was shown that, even in a group of people already

interested in ecology, the environmental problems are not too important when compared to others, which relate more to the day-to-day life.

But in this group, the two environmental topics listed among the ten issues ranked very highly. A total of 72.3 percent chose "the national environment" as first, second, or third most important problem, and 48.1 percent picked up "local environment" as first, second, or third most important problem in the list. The preference on "national environment" over "local environment" seems to be another indication that people tend to see environmental problems as distant in space.

In order to test whether mass media were giving to this group of people what they judged to be most important, the respondents were asked to state which topics in both lists (the one with eight environmental problems and the one with ten general problems) they were most used to see in media contents. In the list of environmental problems, "air pollution in São Paulo" (which only 2.8% thought to be the most important subject) was appointed by 72.2 percent of the respondents as the one most shown by mass media to their audience; 13.9 percent cited "world-wide" pollution. In the list of general problems, the respondents were asked to cite the three of them they were most used to seeing in media contents. They chose: "national economy" (cited by 58%), "international politics" (cited by 55%), and the Middle East war (cited by 47%). Among the three, only

"national economy" had been chosen by a high percentage of respondents (17.2%) as the first most important topic in the list. Only 11.1 percent had chosen "international politics" as the most important and nobody had chosen the Middle East war (in fact 14.8% chose it as the least important issue in the list).

It was assumed that the participants of this seminar would have at the final of the lectures, enough knowledge about environmental affairs. Thus, the questionnaire did not have a part to measure their knowledge. But it did have a section to assess their attitudes toward ten very controversial environmental problems. Ten strong statements about them were written down and the respondents were asked to say how intensively they agreed with them. The results are in Table 8.

Table 8.--Attitude Assessment of the Participants of CESEC's Seminar.

	Very Pro	Mild Pro	No Op	Mild Con	Very Con	Both Pro
Transamazônica	19.4	41.7	5.6	8.3	25.0	61.1
Rio-Santos	27.8	30.6	16.7	13.9	11.1	58.3
Industry control	88.9	5.6	2.8	2.8	. .	94.4
Birth control	33.3	19.4	8.3	25.0	13.9	52.8
Cars control	36.1	38.9	2.8	8.3	13.9	75.0
Less wealth	44.4	27.8	11.1	8.3	8.3	72.2
Close beaches	69.4	13.9	2.8	11.1	2.8	83.3
Santos	33.3	44.4	16.7	2.8	2.8	77.8
São Paulo	77.8	19.4	2.8	. .	. .	97.2
U.S.A.	33.3	33.3	8.3	25.0	. .	66.6

This table shows that there is, as it was reasonable to assume, a favorable attitude toward environment in this group. Only two statements did not receive a percentage larger than 60 percent of approval: number 2 ("The Rio-Santos road is an ecological crime"), which was supported by 58.3 percent, and number 4 ("birth control is an urgent need in Brazil"), which was supported by 52.8 percent. However, one has to ponder that the "Rio-Santos" road has been seen as an economical boost for Santos and that the Catholic Church condemns birth control. Both economical and religious are strong considerations for every person in Brazil. Even a highly advertised "benefit" such as Transamazônica road was properly perceived as an environmental hazard and 61.1 percent of the respondents agreed with the statement that "the Transamazônica should not have been constructed." Finally, it seems important to point out that 77.8 percent strongly agreed with the statement "São Paulo's pollution problem is very grave," but only 33.3 strongly agreed with the one "Santos' pollution problem is very grave."

The other statements supported by the respondents were: "there should be a more rigid control over industrial activities" (number 3 in the table), "cars should have their circulation constrained in order to lessen pollution levels and energy consumption" (number 5), "it is more desirable to have less material wealth in order to preserve a good environmental quality" (number 6), "if Santos

beaches were polluted in a level that could risk public health, it would be better to have them closed down even if this action brought economical damages to the city" (number 7), "the pollution problem in the U.S.A. is very grave" (number 10).

In order to check whether those favorable attitudes would be confirmed by a likelihood that people would be ready to change their patterns of life and even go against their vested interests (hypotheses 3 assumes that it would not happen), some questions were designed. The respondents were asked to say whether they would or would not perform some actions in behalf of environmental quality. Of course, there was no commitment and in fact that was just a new attitude assessment. But the questions were constructed in a personal way which was hoped would require a deeper involvement of the respondent with the problem. This really happened, as shown in Table 9. Indeed, despite being a special group of already environmentally concerned people, the majority of them showed no desire of changing their set of patterns or going against their vested interests just for the sake of improving environmental quality.

By Table 9, one can see that the more personal a question is, the more likely the answer "no" to the proposal which is given. If one considers that many respondents may not have been very candid and would probably try to conform to the group, it is easy to conclude that even

Table 9.--Seminar Participants' Predisposition to Act in Behalf of Environment.

	Yes	No
Would you give money for an environmental group?	33.3	66.7
Would you denounce a polluter to public officials?	47.2	52.8
Would you boycott some products made by polluters?	52.8	47.2
Would you boycott one-way products?	47.2	52.8
Would you consume less for environmental reasons?	47.2	52.8
Would you adopt birth control practices?	30.6	69.4
Would you stop using cars for ecological reasons?	27.8	72.2
Would you sue a builder who destroys green areas?	77.8	22.2
Would you sue a polluter industry?	63.9	36.1
Would you join an environmental group?	69.4	30.6

a larger majority of them would not act in behalf of environment when this action were likely to go against their interests or modify their established set of patterns and ambitions. All this, in spite of a very strong attitude set favorable to environment. This finding suggests that attitudes are not a very good predictor of behavior, as many authors claim (see pp. 88 through 90).

However, a majority of the respondents said to believe that their individual contribution is important for the solution of environmental problems. The finding that 77.8 percent of the respondents believe so contradicts the prediction stated in hypothesis three that "people tend to consider their participation as useless." One could argue

that the peculiarity of the group would justify the finding. But, as will be shown ahead, the general public holds a still more spread belief that the individual participation is important and valuable.

A question dealing with a very trivial issue was designed to test how strong could be the relation between attitude and behavior. The respondents were asked to answer whether they would stop watching their favorite television program if the non-commercial TV station were to schedule an environmental series at the same time. In this group, 88.6 percent said yes (they would drop their favorite program) and 11.4 said no.

Finally, media exposure patterns of this group were measured. It was found that the respondents are exposed to mass media in an average level for Brazil. Only 8.8 percent said they did not watch television at all; 17.6 percent answered they watched one hour a day, 26.5 percent two hours a day, 11.8 percent three hours a day; 8.8 percent four hours a day, 20.5 percent five hours a day, and 5.9 percent six hours a day. Santos newspapers are not read by 29.4 percent of the sample: 52.9 percent read one Santos newspaper every day, and 17.6 percent said they read both Santos daily newspapers every day. A majority of 58.8 percent claimed they did not read daily São Paulo newspapers, but 29.4 percent said they read one, 8.8 percent that they read two, and 2.9 percent that they read three São Paulo daily newspapers every day. A majority of

63.6 percent said they do not listen to Santos radio stations at all, but only 32.4 percent said the same about São Paulo radio stations. The figures indicated that São Paulo radio stations are much more listened by the sample than Santos ones. The radio listening average for this group is about two hours a day. Finally, 20.6 percent of the sample answered they did not read any magazine regularly, but 32.4 percent read one, 17.6 read two, 14.7 percent read three, and 14.7 four.

CHAPTER XIV

A SURVEY AMONG THE PUBLIC

The attendants of CESEC's seminar constituted a special group which may in no way be considered as representative of Santos community. It is interesting to know what their opinions are because they are people linked to the problems which are being analyzed here. However, it is not possible to make any generalization based on the data presented in the earlier section of this work.

Thus, a second survey with a larger and more representative sample was carried out for this work by CEPAC--Centro de Pesquisas Aplicadas em Comunicacão (Center for Applied Research in Communication). CEPAC is an organization linked to the Communication College of Santos which has been realizing much important applied research in the field of communication in Santos.

Three hundred subjects drawn by a multistage area sampling in Santos, São Vicente, and Cubatão were to be personally interviewed by CEPAC. A total of 298 interviews were carried out and their results used by this work.

The outcome showed to be representative of Santos community despite some problems. For instance there seems

to have been an over-representation of people at a college educational level (27.9% of the sample) and an under-representation of a below primary educational level (3.4% of the sample). The national figures for college level people are 1.0 percent, and for below primary level are 10 percent. Even if one takes into account the fact that Santos is a city with a great number of colleges, the rate of 27.9 percent seems to be too high. Following the same rationale, the 3.4 percent rate for below-primary level also looks as not very representative of the whole community.

But these problems may not be so important. People at the below primary educational level are very likely to be the "know-nothings" referred to on page 52. Their answers would probably be of little value. On the other hand, if the excessive number of college level people distorts the representation of the whole community, it also furnishes a better picture of the social segments which take decisions in any community.

An overall view of the sample shows that: 23.2 percent of the sample were between 15 and 20 years old, 24.2 percent between 21 and 25 years old, 16.1 percent between 26 and 30 years old, 14.4 percent between 31 and 40 years old, 12.4 percent between 41 and 50 years old, 6.7 percent between 51 and 60 years old, and 3.0 percent were older than 60.

As said above, 27.9 percent of the sample were at the college educational level, 32.9 percent at high school

level, 21.9 percent at secondary level, 14.4 percent at primary level, and 3.4 percent below primary level.

The first part of the questionnaire intended to assess the respondents' knowledge of environmental problems. They were asked how they ranked their own knowledge and answered ten easy questions about environmental affairs. Even a slight indication that the respondent knew the answer was marked with a "yes."

In the self-rating question, only 2.7 percent of the sample said they did not know anything about environmental affairs, 29.5 percent rated their knowledge as "weak," 47.7 percent ranked their knowledge as "average," 18.5 percent said it was "good," and only 1.7 percent graded it as "very good."

The results of the questions about environmental affairs are shown in Table 10.

These results were relatively surprising. Despite the fact that the questions were easy and that slight indications of knowledge were marked with a "yes," it was not expected a so high level of knowledge. Only two questions were not correctly answered by a majority, both of them concerning the federal environmental agency SEMA (questions numbers 2 and 9). Questions number 3 and 10 which also dealt with governmental affairs related to environment (CETESB is the state wide official environmental agency) were properly answered by a slight majority. The other 6 questions had their answers known by an overwhelming

Table 10.--Assessment of Santos Public Environmental Knowledge.

	Yes	No
Do you know what "ecology" means?	72.5	27.5
Do you know who Paulo Nogueira Neto is?	46.0	54.0
Do you know whether there is any pollution law?	51.7	48.3
Do you know what is the area most affected by pollution problems in São Paulo State?	85.2	14.8
Can you cite three recent important events about environment?	75.8	25.4
Can you cite some air pollution causes?	97.0	3.0
Can you cite some sea pollution causes?	96.3	3.7
Can you cite some river pollution causes?	90.6	9.4
Do you know what SEMA is?	37.2	62.8
Do you know what CETESB is?	54.0	46.0

majority. These results suggest that the knowledge level of environmental problems among Santos population may be higher than could be deducted from its behavior during recent environmental crises (see pp. 146 through 150).

The second part of the questionnaire dealt with attitude measurement. Its results are in Table 11.

These results show that there is a widely spread favorable attitude toward environment among the public in Santos. For instance, 40.3 percent of the sample strongly agree that "pollution problem is one of the most important nowadays," and other 43.3 percent agree moderately, giving a total of 83.6 percent of support to the statement.

In some controversial questions, the general public's attitude is even more favorable than that shown by CESEC's seminar attendants. For instance, 58.2 percent of

Table 11.--Attitude Assessment of Santos Public Toward Environmental Problems.

	Very Pro	Mild Pro	No Op	Mild Con	Very Con	Both Pro
Importance	40.3	43.3	1.3	11.1	4.0	83.6
Nature protection	64.8	27.5	1.3	5.7	.7	92.3
Industry control	58.9	23.2	3.4	12.8	1.7	82.2
Birth control	27.3	31.0	2.0	19.5	20.2	58.2
Car restriction	21.9	30.3	1.0	31.0	15.8	52.2
Less wealth	67.8	23.2	1.0	5.4	3.4	90.2
Beaches interdiction	70.6	16.9	1.4	4.4	6.8	87.5
Santos problem	21.4	38.8	3.1	27.6	9.2	60.2
São Paulo problem	78.1	14.1	3.0	2.7	2.0	92.3
U.S.A. problem	19.2	11.4	45.8	14.8	8.8	30.6

the general public support birth control practices while 52.8 percent of the seminar attendants do; 90.2 percent of the general public think it is more desirable to have less material wealth in order to preserve a good environmental quality and only 72.2 percent of the seminar attendants do the same; 87.5 percent of the general public believe it would be better to have Santos' beaches closed down than put in risk public health, while 83.3 percent of the seminar attendants answered this way.

However, in a general examination, the participants of the seminar held a slightly more favorable attitude toward environment than the general public. The important point to be stressed is that the prediction stated in hypothesis three that "people tend to have a favorable

attitude toward environment" seems to have been comfirmed by both samples.

Media exposure patterns found in this sample are very typical for the area under study. When compared with the patterns found among the seminar attendants, it may be observed a slight advantage for the latter, what is normal because their socioeconomic and educational levels are also superior. This comparison between average media exposure pattern among the first and the second samples of this survey are shown in Table 12.

Table 12.--Comparison of Average Media Exposure Pattern Among the Larger and Smaller Samples.

	Larger	Smaller
TV (hours a day)	2.010	2.794
Santos papers (how many daily read)	0.868	0.882
SP papers (how many daily read)	0.541	0.559
Santos radio (hours a day)	1.272	1.559
SP radio (hours a day)	1.331	0.606
Magazines (how many usually read)	1.269	1.824

Thus, the average person in the larger sample is slightly less exposed to mass media than the average person in the smaller sample. But both of them are in the average pattern of media exposure for that specific area of Brazil.

In the assessment of media exposure for the larger sample, an interesting finding is that 79.2 percent of the sample never attended any lecture or any class about

environmental affairs, and 14.1 percent had attended only one.

The differences among the two samples are much larger when they were asked to state how worried they were about the environmental hazards. The smaller sample respondents were asked to say how worried they were before the seminar they attended to (but, of course, it is difficult to assess how faithful is their recall of their worry before the seminar). The difference between the two samples in the degree of worry is much larger than the difference in the media exposure patterns, what suggests that it is very unlikely that media exposure may have any causative relation with degree of worry.

Table 13.--Comparison of Degrees of Worry About Environmental Problems as Stated by the Larger and Smaller Samples.

	Larger	Smaller
Very much worried	6.1	28.5
Very worried	31.6	33.3
Worried	26.6	25.0
Little bit worried	24.6	8.3
Unworried	11.1	2.8

A linkage between the medium through which a person was by the first time warned about environmental hazards and his degree of worry about these problems may be suggested by the data collected from the two samples. The overwhelming majority of the larger sample had their awareness

stirred up by some mass medium (confirming the prediction in hypothesis one). In the smaller sample, this pattern was not the same. On the other hand, the larger sample was less worried about environment than the smaller one (the average person in the larger sample was "worried," the average in the smaller was "very worried"). In the large sample, 87.0 percent said they had had their awareness about environmental affairs first stirred up by some mass medium (50.2% said TV, 26.3% said newspaper, 6.8% said radio, 3.8% said magazine). Only 11.9 percent of the larger sample cited an interpersonal source as the first one to warn them about environmental problems (4.1% said a lecture, 7.8% said friends or relatives), and 1 percent cited a book. As it was already shown, only 45.7 percent of the smaller sample cited a mass medium as their first source of awareness, 33.3 percent cited an interpersonal source, and 20 percent cited a book. The cross-tabulations for this relationship were not significant enough to assure any conclusion, but this seems to be good topic for further exploration.

The predictions in hypothesis one that mass media are the most important knowledge source and opinion shaper as far as environmental affairs are concerned, were completely confirmed by the data collected from the larger sample. An overwhelming majority of 94.5 percent of the sample cited some mass medium as their main information source on environmental affairs (56.5% cited television, 27.1% cited newspapers, 6.8% said radio, 4.1% said

magazines). Only 5.1 percent of the sample cited interpersonal sources (3.4% said other people, and 1.7% said lectures, classes or seminars) and .4 percent cited books.

When they were asked to state what was the most important opinion source on environmental affairs, 82.1 percent of the sample cited some mass medium (42.3% said television, 36.7% said newspapers, and 3.1% said radio) and only 17.9 percent cited some interpersonal source (14.1% said teachers, 2.1% said relatives, and 1.7% said friends).

However, another prediction in hypothesis one (that printed media are more important than electronic media whenever environmental news is concerned) was once again rejected by the survey.

Predictions stated in hypothesis two that people would like to have more local information and more instruction about how to act to help solving environmental problems, and that mass media have been failing in giving them such information were once again confirmed by the survey. The criticism against mass media was not so strong as in the smaller sample, but the larger sample also showed without doubt their dissatisfaction.

Asked to suggest what kind of information they would like to have from mass media concerning environmental news, 46.6 percent of the larger sample answered "more information about how each one might act in order to fight against ecological problems." This suggestion was also the overwhelming majority among the smaller sample (77.8%).

Table 14.--Comparison Between the Larger and Smaller Samples' Media Appreciation as Far as Environmental News Is Concerned.

	Larger	Smaller
Very good	10.1	2.8
Good	31.9	11.1
Weak	54.7	58.3
Bad	3.4	27.8

But the demand for local information was not the second most preferred by the larger sample as it had been by the smaller one: 23.5 percent asked for "more scientific information," 21.1 percent asked for more general information, and only 8.5 percent asked for "more local information." Thus, it seems clear that the public in Santos does want more information instructing it how to act on environmental problems, but it is not so well demonstrated by this survey whether it wants or not more local information.

It was obvious that the smaller sample was constituted of people who were likely to actually read and watch environmental news. However, this prediction was not so easy about the larger sample. So, in order to assess whether their criticism on environmental news was based on actual audience, the respondents were asked to state whether they usually paid attention to environmental news. An overwhelming majority of 92.3 percent of the sample claimed that they did.

As already seen, the larger sample showed a very favorable attitude toward environmental issues, confirming one of the predictions made in hypothesis three. However, hypothesis three also stated that in spite of this favorable attitude, people do not tend to change their set of patterns or to go against their vested interests for the sake of contributing for the solution of environmental problems. In the smaller sample all those assumptions were confirmed.

The same method was used in the questionnaire for the larger sample and the results were overwhelming in support of the predictions stated in hypothesis three. The results are in Table 15. They show that an absolute and indisputable majority of the sample is not predisposed to perform any of the actions suggested by the survey. The only one which was chosen by a significative percentage of the sample (48.3%) was "to denounce a polluter to public officials." Even the question whether the respondents would drop their favorite TV program to watch an environmental series on the non-commercial TV station was answered negatively by the majority: 59.0 percent said no, and 41.0 percent said yes. The respondents in the smaller sample had answered positively to this question.

These results are much more definitive in this larger sample than they had been in the smaller one. But in both of them, there is no doubt that the statements in hypothesis three were confirmed by this survey.

Table 15.--Larger Sample Respondents' Predispositions to Act in Behalf of Environment.

	Yes	No
Would you give money for an environmental group?	3.0	97.0
Would you like to pay more taxes to improve the environmental quality?	3.7	96.3
Would you denounce a polluter to public officials?	48.3	51.7
Would you boycott some products made by polluters?	30.1	69.9
Would you boycott one-way products?	20.3	79.7
Would you consume less for environmental reasons?	5.7	94.3
Would you adopt birth control practices?	6.8	93.2
Would you stop using cars for ecological reasons?	3.7	96.3
Would you join an environmental group?	6.8	92.6
Would you sue a polluter industry?	8.8	89.2

In order to test the predictions also stated in hypothesis three that people tend to see environmental problems as distant in time and space, a list of eight environmental issues was offered to the respondents who were asked to pick one of them up as the most important one in their opinion.

As it had already happened in the smaller sample, the majority chose the most general and distant topic as the most important one: 36.0 percent of the larger sample picked up "world-wide pollution" (almost exactly the same percentage of the smaller sample). The second most chosen topic was the second most general and distant one, "population explosion in the world" (cited by 18.2% of the sample).

"Sea pollution in Santos" was chosen by 12.9 percent of the sample, "air pollution in Cubatão" by 10.8 percent, "air pollution in São Paulo" by 8.4 percent, "Billings Dam problem" by 8.0 percent, "pollution in the rivers all over Brazil" by 3.1 percent, and "sea pollution all over the world" by 2.4 percent.

In the total, 56.6 percent of the sample chose some world-wide problem (compared with 50% in the smaller sample), 31.8 percent chose issues directly linked to Santos (compared with 36.1% in the smaller sample), and 11.5 percent chose a national problem far from Santos (compared with 13.9% in the smaller sample).

Thus, the prediction that people tend to see environmental problems as distant in time and space seemed to be confirmed by both the samples.

In order to compare the importance of environmental subjects when put beside of other problems, the respondents were asked to rank a list of ten relevant issues.

The results showed that "national economy" is the issue which most people are concerned with (29.5% of the sample chose it as the first most important one), followed by "quality of education" (chosen by 20.1%), "national politics" (15.9%), "international politics" (11.5%), and "national environment" (chosen by 6.7% of the sample as the first most important issue in the list). "Local environment" was chosen only by 3.4 percent of the sample (trailed only by "local politics" and "soccer" in the list of ten).

These results showed clearly that environmental problems are not very important when compared to others more related to each one's fate. The smaller sample had given a higher grade to "national environment" (appointed by 24.1% of that sample as the most important topic in the list) and "local environment" (chosen by 11.1% of that sample). But, of course, that was a group of people atypically concerned with environmental problems.

The distribution made by the larger sample seems to be much more representative of the general feelings of the population in Santos. Table 16 shows how that sample ranked the two environmental topics in the list.

Table 16.--Importance of Environmental Affairs When Compared to Other Issues as Ranked by the Larger Sample.

	National Environment	Local Environment
First most important topic	6.7	3.4
Second most important topic	11.9	8.2
Third most important topic	15.6	6.4
Fourth most important topic	14.8	4.9
Fifth most important topic	13.3	13.1
Sixth most important topic	10.0	9.4
Seventh most important topic	18.1	21.3
Eighth most important topic	5.9	21.3
Ninth most important topic	2.6	9.4
Tenth most important topic	1.1	2.6

These results confirm the prediction stated in hypothesis three that most of the people believe the environmental problems are important (as shown by the

attitude measurement, on page 191), but not too much when compared with other more personal questions. These results also reinforce the assumption that people tend to see environmental problems as far in space, for the ranking of "national environment" is much better than "local environment."

In order to assess whether media give to the public more information about what the public considers the most important issues, the respondents were asked to cite the three topics they were most used to seeing on TV, read in newspapers or listen in radio. The three most cited were "national economy," "national politics," and "international politics" listed respectively in first, third, and fourth places by the respondents, as the most important topics. Thus, there seems to be a correlation between what people think the important issues are and what media offer to people as the most important issues.

To determine whether the issues most seen on media are also the issues most discussed by people in their interpersonal channels of communication, the respondents were asked to cite three topics they thought were those they most talked with other people about. The three most cited were "national economy," "national politics," and "quality of education" listed respectively as first, second, and seventh topics which the respondents were most used to having from mass media. Thus, there also appears a relation between which issues media offer to people as the most

important and which issues people talk with other people about. But this relation does not seem so strong.

Asked specifically whether they talked with other people about environmental affairs, 65.2 percent of the respondents said yes and 33.8 said no.

Finally, the respondents were asked whether they would like to help to solve environmental problems. Despite their lack of predisposition (showed on page 198) 89.9 percent of the sample said yes and only 10.1 percent said no. Asked whether they thought their personal efforts would be valuable, 83.1 percent said yes and 16.9 percent said no. This result contradicted again the prediction stated in hypothesis three that people tend to see their participation and efforts as useless.

Cross-Tabulations

Some cross-tabulations were tried in both the surveys. In the small one, probably due to its size, no significant and relevant cross-tabulation was found. In the large one, some significant cross-tabulations were found, but no important conclusion came out.

For instance, no important relation between level of knowledge and attitude was found. The percentage of people with good amount of knowledge who held favorable attitudes was similar to the percentage of people with small knowledge who held favorable attitudes toward environmental matters as well.

It was also found a slight evidence that those people who knew more about the environmental problems were more likely to classify themselves as more worried about those problems than those people who knew less.

A prediction based on prior American research which was confirmed by this survey is that the older a person is, the less likely he or she is to hold a favorable attitude toward environment. An almost perfect curve showing that an increase of age corresponds to a decrease of favorability was found in the cross-tabulations of the topic which measured how important the respondents thought environmental problems are and their age, as Table 17 shows.

Table 17.--Relation Between Attitude and Age.

Age	Percentage of Favorable Attitude
15-20 years old	91.3%
21-25 years old	86.1%
26-30 years old	85.4%
31-40 years old	79.0%
41-50 years old	86.5%
51-60 years old	60.0%
Older than 60	53.3%

As far as mass media are concerned, some significant cross-tabulations were also found, but almost always just confirming well known predictions. For instance, that those people who rely more on mass media to get their information about environmental problems and who are indeed more exposed to mass media are those people who have a better

knowledge about environmental affairs. Those who rely more on TV constituted the majority of those who knew how to answer the most difficult questions in the questionnaire. However, within each group of people put together according to their main information source, those who rely more on printed media seemed to have larger percentages of correct answers to the most difficult questions, as shown in Tables 18 and 19.

Table 18.--Main Sources of Information of Those People Who Answered Correctly the Most Difficult Questions in the Knowledge Measurement Test (Questions #2, 9, 10).

Total of Right Answers	Main Sources of Information						
	TV	Radio	Paper	Mag.	Books	Lect.	Talk
Question 2:134	47.0	8.0	34.3	9.0	0.0	.7	1.0
Question 9:108	59.3	6.5	31.5	1.8	0.0	0.0	.9
Question 10: 157	58.6	7.0	28.0	3.8	.6	.7	1.3

The relationship between those media indicated by people as their main opinion sources and the attitudes held by the respondents does not allow any kind of conclusion. If one takes the four most controversial items in the attitude measurement part of the questionnaire, he will note that the majority of those who were very favorable to the environmental proposition said they relied on mass media as their main opinion source. But the majority of those who were against the environmental proposition also relied more on mass media, as well as those who did not have opinion.

Table 19.--Percentage of People Who Answered Correctly the Most Difficult Questions in Each Group of People Put Together According to Their Main Information Sources.

Sources of Information	% of Correct Answers for Questions		
	#2	#9	#10
Television	38.2	38.8	55.8
Radio	60.0	35.0	55.0
Papers	58.2	43.0	55.7
Magazines	75.0	16.7	50.0
Books	0.0	0.0	100.0
Lectures	20.0	0.0	40.0
Talking	30.0	10.0	10.0

For instance, let us take the item which dealt with birth control, in Table 20.

As it was seen, almost always the majority of people in any of the five positions said they relied more on television as an opinion source than any other medium.

If one goes within each group of respondents put together according to their main opinion source and sees what their attitudes were, no conclusion may be reached either. Within each group, the percentages are split among the five positions, without any apparent significative trend, as may be seen in Table 21, taking again the item of birth control.

The percentage of people who rely more on some interpersonal sources is so little that only three respondents mean 50 percent of the group, as in Table 21, where three people who said relatives were their main opinion

Table 20.--Relation Between Opinion Source and Attitude Toward Birth Control.

Source	Degrees of Attitude				
	Very Pro	Mild Pro	No Op	Mild Con	Very Con
Television	46.2	37.0	33.3	50.0	39.0
Papers	30.7	43.8	33.4	30.4	37.3
Radio	1.7	2.3	0.0	7.1	3.4
Interpersonal sources	21.4	16.9	33.3	12.5	20.3

Table 21.--Attitudes Toward Birth Control Among Respondents Grouped According to Their Main Opinion Sources.

Source	Degrees of Attitude				
	Very Pro	Mild Pro	No Op	Mild Con	Very Con
Television	26.6	25.0	3.1	32.8	12.5
Papers	25.3	38.9	1.1	14.7	20.0
Radio	11.1	22.3	0.0	44.4	22.2
Teachers	30.0	30.0	2.5	17.5	20.0
Friends	60.0	0.0	20.0	0.0	20.0
Relatives	0.0	50.0	0.0	0.0	50.0

source were relatively in favor of birth control and other three were strongly against.

The pattern showed for the item of birth control is more or less the same for all the controversial questions in the attitude measurement part of the questionnaire.

When one examines the relation between the medium through which the respondents were first warned about environmental problems and the degree of worry they declare to feel, there seems to be a trend for those who were warned by a book or a lecture to declare themselves more worried than those who were warned by TV or radio, but the significance level for that cross-tabulation is too high (.4925). The same happens to the cross-tabulation relating the medium through which the first warning came and the predispostion to help solve problems: there seems to be a trend for those warned through interpersonal media to answer in larger percentages that they want to help than for those warned through some mass medium. But again the significance level was too high (.6610). The same trend for the group of people warned by the first time through books or interpersonal media to answer positively in larger proportions to the environment appears in the relation with how valuable one thinks his or her individual participation is. Those in the group warned by mass media do not answer that they think their participation is important in as large percentages as those in the group warned by book or interpersonal source. However, the significance level found for

this survey was again too high for the trend to be taken into consideration. But this point may deserve further attention in future research in this field.

Despite the fact that no important cross-tabulation finding was achieved by this work, it does not seem to have lost its value, because all the hypotheses were tested through simple tabulations and were confirmed or rejected with an apparent success. The cross-tabulation findings would merely be a refinement of the work, not its main purpose.

CHAPTER XV

SUMMARY AND CONCLUSIONS

This work had two purposes: to review and summarize the available literature on mass media and environmental affairs in its first part and to test some hypotheses about the relationship between mass media and environmental affairs in its second part.

The hypotheses were formulated based on the available literature reviewed and summarized. The test was carried out through four survey instruments in Santos, Brazil. Hopefully, both the purposes would help to improve media's performance as an agent of environmental education if they were successfully carried out and taken into consideration by those persons who deal with the mass media and who happen to read this work some day.

Most of the hypotheses were confirmed by the tests. For instance, hypothesis one was almost completely confirmed. It stated that "the first warning about environmental hazards are more likely to come from mass media than from any other source for most of the people" (strongly confirmed by the larger sample and slightly by the smaller one); that "mass media continue being the most important

source of knowledge about environmental affairs for most of the people after that first warning" (strongly confirmed by the larger sample and slightly denied by a very atypical sample which was the smaller one); that "mass media are also the main attitude shaper, particularly in countries such as Brazil, where the audience does not hold strong positions about these problems yet" (strongly confirmed by the larger sample and slightly denied by the smaller sample). The prediction that "printed media seem to perform a more important role than electronic media both as source of information and attitude shaper" was strongly rejected by both the samples. The reason may be the fact that in Brazil, printed media still have what can be classified as an "elite audience," as it was shown during the comparison between Brazilian and American media (see pp. 127 through 133). The statement that "printed media seem to be more important than electronic media" may be correct for the American reality but not for the Brazilian one.

Hypothesis two was partially confirmed and some of its predictions could not be confirmed or rejected. It stated that "the public would like to have more information concerning local problems, and more specific instructions about how to act in order to solve environmental hazards" (both the samples confirmed strongly the demand for instruction about how to act, but there was not enough evidence to say that public in Santos is also interested in having more information about local environmental problems);

that "mass media fail in furnishing to the public these kinds of information" (strongly confirmed by both samples, and by the media monitorship, though the monitorship showed a lot of local information. But this high percentage of local information cannot be taken into account because of the atypicality of the month in which the monitorship was carried out); that "media managers do not hold a special concern about the subject" (confirmed by the questionnaires answered by media managers); that "media managers ordinarily do not rank environmental affairs at high levels of importance when compared with other issues" (the managers' questionnaire was not able to confirm or reject that, but the answers from both the samples about what issues they are most used to receiving from mass media seem to confirm the assumption); that "mass media information does not engage the audience in active participation" (confirmed through the monitoring and the content analysis that showed no demand for audience action from media).

Hypothesis three was almost completely and strongly confirmed. It stated that "people tend to have a favorable attitude toward environment" (strongly confirmed by both samples); that yet "people do not feel like changing their set of patterns for the sake of contributing for the solution of problems" and "they are not likely going against their vested interests because of environmental quality" (strongly supported by the larger sample, and supported by the smaller one, though not so deeply); that "most of

people believe the environmental problems are important, but not too much when compared with other more personal questions" (strongly confirmed by both samples); that "people tend to feel their participation to solve problems as useless" (strongly rejected by both samples. People in both samples claimed to believe their participation is important, even having shown through other answers that this participation is very small); that "people tend to see environmental problems as distant in space" (strongly confirmed by both samples).

A point which could be more explored in future research on mass media and environmental affairs is the relationship between the medium through which a person is warned by the first time about environmental hazards and the degree of worry and commitment held by that person toward these problems. This work showed that this may be a sound relationship which deserves more observation.

This work was carried out under the assumption that mass media have a very important role to perform in the struggle for a better human environment all over the world and that they should be used in the most effective way to help the improvement of environmental quality. To find out which is the most effective way and use it may be one of the most important functions of those who work in and with mass media.

"As far as environmental problems are concerned, what is not made today will have to be made in the future, under other conditions and under a price imposed by despair"

Jose Piquet Carneiro (late Brazilian environmentalist leader).
As quoted by VEJA (June 11, 1975), p. 63.

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