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CHANNEL EFFECTS IN COMMUNICATION PROGRAMS

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INTRODUCTION

The consensus is unmistakable: mass media channels may be effective for creating awareness, providing knowledge and perhaps for setting agendas, however when it comes to persuasion to produce behavior change, face-to-face channels are essential. The derived implication is that it is foolhardy to organize a public communication program (whether to encourage seat belt use in the United States or adoption of agricultural fertilizers in Kenya) without organizing a face-to-face channel to complement mass media channels.

This is a deeply satisfying view for those who see debates about channels as a competition between human beings and machines and are quite pleased to see the value of human contact certified. However, no matter how satisfying the reaffirmation, both the consensus and the implication may be wrong, and often lead program planners down mistaken paths.

This chapter examines the underlying logic and the evidence which supports this channel hypothesis. Particular attention is paid to problems of its application in less developed countries, where organizing face-to-face channels on a large scale is often difficult. The potential for influencing behavior change through mass-media alone is a special focus. Fresh illustrative evidence comes from a recent health communication program in Swaziland.

The Conventional Framework

There are two major strands of research which address issues of channel competition. There is an older tradition of educational research, stimulated by the availability of technologies (like television) with potential as teaching substitutes, which compared learning outcomes for students taught by one medium versus another. A typical early study

would compare a live instructor with a televised version of the same lecture. Studies rarely showed significant differences and led to a recognition that little of the variance in learning was due to the technology carrying the message, per se. (Chu and Schramm, 1967; Schramm, 1977).

The second and dominant strand of research fits within the field of diffusion of innovations, with most commentators depending on the syntheses by Everett Rogers and his colleagues (cf. Rogers, 1983). Among the major elements of the diffusion framework is an assumption that adoption of an innovation occurs through a process of stages over time.

"The innovation-decision process is the process through which an individual... passes from first *knowledge* of an innovation, to forming an *attitude* toward the innovation, to a *decision* to adopt or reject, to *implementation* of the new idea, and to *confirmation* of this decision" (Rogers, 1983:165; italics, mine).

Field applications, often in agriculture, have been the motivating concern for diffusion research. Thus once the stages were differentiated a natural early question was whether the influence of particular channels varied with the stage in the innovation-decision process. For example, if someone were in the earlier phases might they respond to information/influence from one channel but if they were in a later stage tend to turn to an alternative channel? A good deal of research examined this question and again the results were summarized by Rogers:

"Mass media channels are relatively more important at the knowledge stage and interpersonal channels are relatively more important at the persuasion stage in the innovation-decision process." (Rogers, 1983: 199)

The empirical base for this conclusion is perhaps more equivocal than suggested by the straightforward declaration. Concerns about the quality of evidence are presented in a

subsequent section of this chapter. However, the common sense logic of the conclusion has led to its ready acceptance. A list of justifications includes the following:

Interpersonal channels "(p)rovide a two-way exchange of information...(to) secure clarification or additional information" (Rogers, 1983:198).

"Interpersonal contacts, the reasoning runs, are homophilic [*between people who are similar*] and therefore credible; consequently the messages they deliver should be credible" (Chaffee, 1982:61).

Changing important practices is hard, especially for an isolated individual. Adoption of an innovation will be far easier if interpersonal contacts make it clear that others around one are changing also. For most members of a community, adoption of a new practice is social behavior, reflective of reference group norms, rather than individual behavior, reflective of personal knowledge and attitude about the innovation.

Interpersonal channels have the power to overcome selective exposure: it is easier to command attention to a message through face-to-face communication than through mass communication.

Authors often admit that mass media have important roles in diffusion processes: media reach large audiences, they can diffuse new information efficiently, well-produced messages may attract attention, and distortion of messages can be minimized. However even while accepting the utility of mass media, there is a well-nigh universal assumption that they must be complemented with organized interpersonal channels if effective diffusion is to occur.

Attitudes and actions are most influenced by mass communications when the latter are linked with, and reinforced by, agents of change in the field...The performance of broadcast media in the fields of development ... depends on... the extent to which these development efforts are linked with agents of change in the field (Katz and Wedell,1977:184).

The logic for combining mass media and interpersonal channels accepts each of the earlier arguments about the value of interpersonal communication. In addition it emphasizes that mass media inevitably will provide general messages which will have to be re-explained and made locally relevant by an expert local source.

Challenges to the Conventional Framework

Most of the justifications for the predominance of interpersonal channels and the need for complementing media channels with interpersonal ones make common sense. Nonetheless a measured theoretical critique might find them wanting.

Chaffee (1982) doubts the universal equation of homophily with credibility. Perceived expertise, for example, may lend greater credibility to a mass media channel than to some interpersonal ones.

Also, one may accept that social support is crucial in the adoption of some new practices. However that does not necessarily translate to a requirement that outsiders organize a network of agents. Interpersonal communication networks will operate naturally, thus creating a social process around diffusion whether or not there is a paid agent to serve as interpersonal communicator. Friends talk about political candidates they have seen on television even if no political agents visit their homes; appropriate treatment of childhood illness is a frequent topic among mothers of young children, whether or not there is a health educator there to organize the discussion.

The assumption that individuals are, typically, slow to change and resistant to innovations which would substantially benefit them may also not survive close examination. If individuals already perceive and are actively trying to solve a problem, information promising a solution may be accepted regardless of the source. If information solves no perceived need, it may be rejected regardless of the source. There is good evidence from agricultural studies, for example, that farmers are often quite responsive to factors of price and risk and readily adopt new technologies which provide clear benefits.

Despite these concerns, it must be admitted that a dispute about the theoretical legitimacy of the justifications for combining interpersonal with mass communication is helpful but

perhaps only a side issue. A challenge is inevitably going to be unconvincing in the general case. A responsive, expert, hardworking, intelligent, and empathic field agent working with a potential adopter and his or her social network is surely better than any imaginable mass media-only diffusion system.

The problem is that framing the dispute in theoretical terms is misleading. The competition between channels is largely a practical dispute, or at least so it would seem to someone whose experience is largely in less developed countries. If there were a supply of responsive, expert, hardworking ...(etc.) field agents who could be recruited, paid for and supported in the field then there would be no reason to consider mass media. The problem is not whether one channel is better than the other in the abstract; the problem is to what extent one or the other can be realized in practice.

Organizing a field structure of interpersonal agents involves their recruitment, their pre-service and on-going in-service training, paying their salaries, providing support in the field (office space, transportation, travel expenses), and supervising them. Unless a program envisions a short term campaign producing an enduring effect, there will be a need to maintain such a field agent infrastructure over time. The infrastructure must operate on a scale to assure that members of the target audience are reached sufficiently often to realize the changes that are being recommended. In agricultural extension some authorities would suggest 50-100 farm families per agent as an effective maximum. Some successful nutrition education projects required an agent for each 100 families (Hornik, 1988).

A recent review of many programs in agricultural and nutrition/health communication suggested that few countries (at least in the developing world which was the focus of the analysis) have been able to mount large scale, long term programs depending on organized face-to-face channels. The reality is that face-to-face

information distribution channels are typically weak. They may reach a small proportion of the potential audience and they carry information that

is either dated or unresponsive to the needs of the audience. Agricultural extension agents are too few, have too little research and logistical support, and are too rarely rewarded for successful work with farmers. Health and nutrition education is most often a burdensome additional activity for the predominantly curative health services; ambitious outreach programs atrophy over time. (Hornik, 1988:157-158).

Evidence About Channels

If it is so difficult to mount such programs, why is the literature so confident as to the necessity for joining media and interpersonal channels for success? And why is it so adamant that media are only useful at the awareness stage while organized interpersonal channels are crucial at the persuasion and decision stages?

Three explanations are worth some attention: sentimental preference, some confusion between the role of organized field agents and that of naturally operating social networks, and too ready inferences from a large but equivocal research base.

In the first lines of this chapter reference was made to the great pleasure most commentators have felt in discovering the "part played by people in the flow of mass communication" (Katz and Lazarsfeld, 1955). There is such pleasure in finding this role that authors have been known to find such interpersonal predominance even when the evidence is unclear. Chaffee and others have noted that the central role ascribed to personal influence by Katz and Lazarsfeld (1955) is inconsistent with much of the evidence in their landmark book. In the field study in Decatur, Illinois, respondents credited mass media at least as often as personal sources as influences on consumer purchases, motion picture choices and fashion preferences.

Despite the equivocal evidence scholars accepted the underlying notion readily. The concept of opinion leadership, of a reliance by individuals on their social networks to make sense out of information received from mass media, became sociology of mass

communication bedrock. It fits with an intuitively powerful as well as subjectively preferable notion of individuals (and social networks) as users of mass media rather than of individuals as pawns of mass media.

If sentiment in part explains the attractiveness of this concept there is also some evidence; however its presentation relies on understanding a quite crucial distinction: evidence that social networks matter as individuals make adoption decisions is not equivalent to evidence that people must encounter trained field agents to make those decisions. Nor is it equivalent to evidence that mass media are ineffective at the persuasion stage, nor that media are only effective if combined with an organized field agent structure.

Perhaps geographical studies provide the strongest evidence that social networks matter in adoption decisions. Lawrence Brown's book *Innovation Diffusion* (1981) summarizes much of this evidence and makes it clear how important geographical proximity (a surrogate measure of social proximity) is to the pattern of spread of innovations, whether that be of air conditioners in a city or of tea raising technology in Kenya. These data alone would make a persuasive case that social networks sharply influence adoption patterns. A review of other supporting evidence can be found in Wright (1986).

However the debate about channels is not about the power of social network influence. It is about the relative roles of *organized* interpersonal and mass media channels in bringing about change. And for this competition the evidence is rather more problematic.

The bulk of the media versus interpersonal literature fits within the diffusion research tradition. While there are hundreds of studies which led Rogers to the conclusion already cited (media for awareness, interpersonal channels for persuasion), they apparently share a common research paradigm. In general they relied on the reports of adopters recalling both the occasion and the source at each stage of the innovation decision process: awareness, persuasion and so on. The usual result was that people recalled some use of both

interpersonal and mass media sources at the earliest, awareness, stage of the innovation adoption process but then moved toward reporting heavy reliance on interpersonal sources at the persuasion and later stages. These results are consistently found, but their consistency doesn't guarantee that inferences about the relative potential for media and for interpersonal channels are correct.

There are two central challenges. First, self report is only an approximate measure of actual behavior. Surely such reports are a reflection not only of what the innovation-decision process was like but of the demands associated with the research context. Respondents are not used to reproducing an influence history which requires them to recognize discrete stages in a process and articulate often single sources of influence at each stage. If the influence of mass media took a subtle form it might not be reported readily. Perhaps a particularly credible media spokesman provided the first awareness of a new seed variety but at the same time led the farmer to be quite favorably disposed to the variety -- nonetheless the media might be reported as the source of awareness without being clearly perceived as persuasive as well. Similarly, if multiple sources were all around an individual, the tendency to report a single source might bias results towards a conventional source (e.g. an extension agent, the nurse in the clinic, a neighbor) rather than a source which is an unconventional way to be persuaded about a change -- radio or other mass medium.

A second research paradigm concern is that many of these studies investigate mass media as sources of information without first establishing that a medium could have been a source. People may not report relying on mass media, but that may reflect a lack of adoption-relevant persuasive content on mass media, not an intrinsic channel failing. Studies reviewed elsewhere (Hornik, 1988) suggest that neither most agriculture nor most health broadcasting provides content consistently useful for their intended audiences. In many countries there is little development broadcasting altogether. Where there is

broadcasting it often is done without detailed knowledge of the problems audiences are trying to solve and it may only incorporate generalized 'good' messages rather than messages which are meant to persuade listeners to adopt specific behaviors:

- a) use fertilizer,
- b) choose to have children you are able to clothe and feed,
- c) breast milk is best

versus

- a) use this fertilizer on that crop in this amount on that schedule,
- b) go to the local clinic on Wednesday to obtain an IUD,
- c) exclusively breast-fed for four to six months

If the persuasive content simply isn't available on the mass media then respondents would report, as they do in the studies Rogers summarizes, that media are not influential.

However that would not justify any blanket rejection of mass media as a persuasive mechanism. The question would still remain: if the organizational failings which lead to irrelevant content were remedied, might not mass media be persuasive without the necessity for incorporating field agents?

However suggesting that existing evidence doesn't justify the conventional wisdom isn't the same as saying it justifies the reverse conclusion. An inference that mass media alone *can* affect behavior awaits positive evidence.

What would be positive evidence? Formally, any evidence that a campaign using mass media exclusively achieved some behavior change would be sufficient. Yet, as a practical matter, one would want stronger, comparative evidence. While commentators have declared that mass media alone can't achieve behavior change, few really mean it in an absolute sense, one supposes. The argument is about comparative power -- the real hypothesis is that media alone would be much less effective than an interpersonal channel in achieving change. Then persuasive evidence would be comparative; ideally it would

show both relative power to achieve effects and relative ability (given available resources) to reach a mass audience.

Evidence would need to be drawn from communication programs that attempt to use both mass media and interpersonal channels. The programs would have to use channels well, that is, provide useful and actionable messages understandably and frequently. The programs should operate under realistic and large scale conditions, allowing some estimate of the operational reach of alternative channels. Ideally channels would be experimentally assigned in an elegant two-factor design; in practice, if some members of the audience were exclusively exposed to each channel and others to both channels, it might be sufficient.

Alternative Views of Channel Effects

Thus far the presentation has referred only imprecisely to the alternative views of the effects of mass media and interpersonal communication channels. It is time to be more explicit about those views. It appears that there are at least five viable alternative hypotheses about these relationships. Two hypotheses fall within the conventional wisdom: they do not admit to any effect of mass media in the absence of a complementary field agent. The other three are challenges to the conventional wisdom in that they allow such an effect. These five alternative formulations are presented in the following paragraphs and in Figure I. The dependent variable of concern is behavior. The independent variables are exposure to messages advocating the adoption of a new behavior, either through mass media or through a field agent.

The conventional wisdom hypothesis says that if there is no outside agent present then exposure to mass media will have little consequence. One formulation of the hypothesis would also suggest that if an agent is present there will tend to be an effect, but that the

presence or absence of mass media would be irrelevant. This version of the conventional wisdom, the Agent Effects Only hypothesis is presented in Figure IA.

An alternative version of the conventional wisdom would allow mass media to have an effect, but only when there is an active field agent. This Agent Necessary for Media Effects hypothesis is presented in Figure IB.

A separate formulation hypothesizes that both mass media and field agents are effective in realizing change but there is no interaction between them. This Additive hypothesis is shown in Figure IC.

The fourth formulation assumes that both channels are effective but are functional substitutes for one another. A member of the audience will change maximally in the presence of either one channel or the other. The Substitution hypothesis is shown in Figure ID.

Finally, it is possible that both channels have independent effects, but if both are present there is a positive interaction. This Reinforcement hypothesis is shown in Figure IE

Figure 1A: Hyp. I
Conventional Wisdom
Agent Effects Only

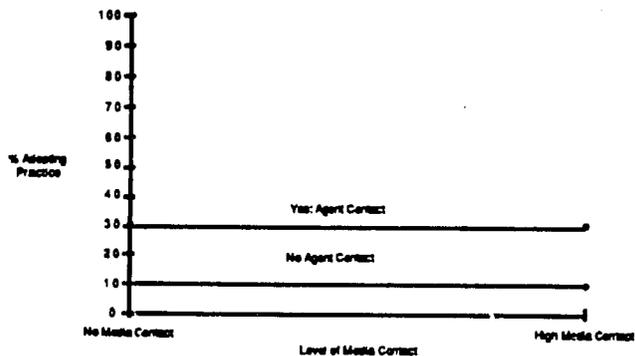


Figure 1B: Hyp. II
Conventional Wisdom
Agent Necessary for Media Effects

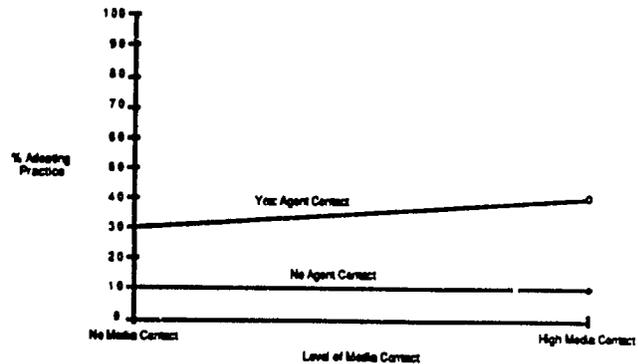


Figure 1C: Hyp. III
Additive Hypothesis

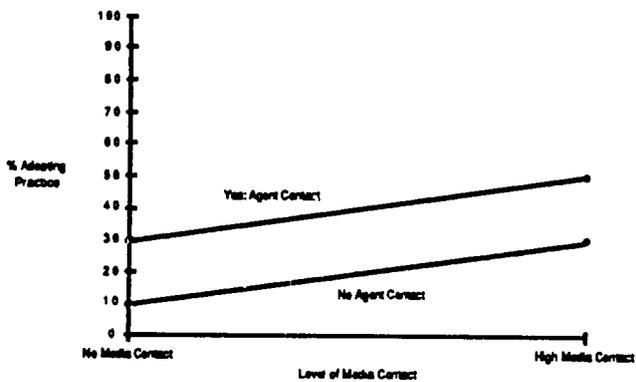


Figure 1D: Hyp. IV
Substitution Hypothesis

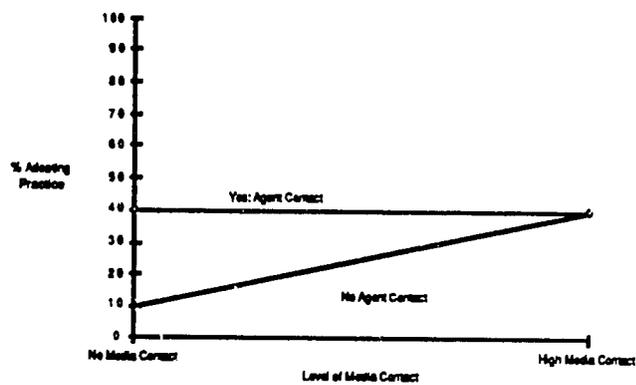
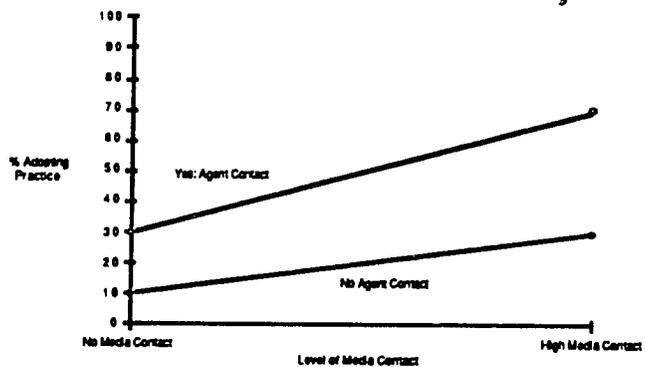


Figure 1E: Hyp. V
Reinforcement Hypothesis



Some Intermediate Summing Up

Some skepticism is justified, then, about the consensus concerning the relative roles of mass media and interpersonal communication in the persuasion stages of the adoption process, and about the resulting inference that field agents must complement mass media if the latter are to be useful. The essential points are these:

- 1) Adoption may indeed be a social process, but that is not equivalent to requiring that outsiders organize a field agent system to stimulate that process.
- 2) Field agents, if there were enough of them and they practiced as textbooks say they should, would likely be an excellent communication channel; however there are few countries and few development sectors within countries which can organize and pay for such an agent network on a large scale and over the long term.
- 3) Evidence that people rely on mass media only in the awareness stage and aren't affected in later stages of the adoption process is open to challenge, both on methodological grounds (studies depend on respondent recall) and on substantive grounds (persuasive content is often unavailable on mass media).
- 4) Studies in this field should recognize that there are five alternative hypotheses which relate mass media and interpersonal channels to behavioral outcomes. Additive, Substitution and Reinforcement effects hypotheses challenge the two hypotheses that fit within the conventional framework, namely Agent Effects Only, and Agent Necessary for Mass Media Effects.

The next section presents a recent study from Swaziland. The study permits an examination of many of the issues raised in these pages, including reach of channels, relative effectiveness of channels in producing practice change, and the fit of observed data to alternative effects models.

CHANNEL EFFECTS IN THE SWAZILAND HEALTH COMMUNICATION PROGRAM

Description of the Campaign

The Government of Swaziland implemented an intense public health communication campaign directed towards the treatment of diarrheal disease in children, beginning in September of 1984 and continuing through March of 1985.¹ Oral rehydration therapy (ORT) holds the promise of substantially ameliorating one of the chief causes of infant mortality in the developing world -- dehydration from diarrheal disease. Many current deaths from this disease are avoidable, but realization of this goal faces substantial obstacles. While some of these obstacles are technical or economic, there is also a substantial educational component: among other things, parents must learn when and how to use rehydration solutions.

The preparatory phase of the campaign began in April, 1984, and led to the launch of a three-pronged activity: radio programs developed in an intensive radio workshop and broadcast on established development programs on the national radio system, printed materials including a flyer with mixing instructions and posters for display at health clinics and at other points, and workshops to train much of the health staff of the country as well as various other extension personnel and local volunteers in treatment of diarrheal disease. Local volunteers and other information distribution personnel were given yellow flags to

¹The Public Health Unit and other components of the Ministry of Health carried out the campaign with technical assistance from the Academy for Educational Development under contract with the U.S. Agency for International Development. Significant financial support for the implementation came through the CCCD (Combatting Childhood Communicable Disease) program of the Centers for Disease Control, also under USAID funding. These implementing groups asked the Annenberg School of Communications at the University of Pennsylvania to design and supervise the implementation of a small scale evaluation of the campaign. The full evaluation is reported in Hornik, Sankar, Huntington, Matsebula, Mndzebele, and Magongo (1986).

display outside of their homes to indicate that they could help with diarrheal disease treatment.

By the start of the campaign, the radio workshop had produced 20 15-minute radio programs, 46 5-minute radio inserts and 22 spot announcements. Throughout the campaign five or six programs were broadcast each week on the national radio station in addition to several daily spot announcements. Eighteen training workshops had been held for health personnel, covering about one-third of the professional staff of public health facilities. Secondary training activities reached additional outreach workers. Also, 260,000 flyers and 7500 posters were printed and distributed.

The campaign focused on a number of objectives but for this chapter the most interesting is the acceptance of the use of home-mixed water-sugar-salt solution as a treatment for diarrheal disease. The overall evaluation of the program relied on data from a number of sources; here the relevant data is derived from interviews with randomly selected national samples of about 430 caretakers (largely mothers) of children less than five years old. Surveys were done both before and after the campaign, but the data reported here is almost entirely from the post-campaign survey.

The Study

The research task here is to estimate the effects of various channels of communication on acceptance of the water-sugar-salt solution for treatment of diarrheal disease. The variables used in the study are presented next and then the observed relationships are described.

Channel Exposure Variables

This was a short campaign: six months from initiation of the technical assistance to the first campaign broadcast, and then seven months of information diffusion activity. Nonetheless it reached a large proportion of the Swazi nation; nearly 85% of all homesteads were substantially exposed to at least one of the campaign's channels. Variables representing each of these channels are described below.

1. Radio Listening. This 0-5 point scale (called LISTEN) summarized variation in likely exposure to diarrheal disease messages over the radio. An individual received one point if 1) her family owned a working radio, 2) she listened to the radio, 3) she reported listening to at least two of the three programs on which the messages were inserted, 4) she reported listening to at least two of the three programs in the previous week, and 5) she reported remembering the content of the broadcast for at least two of the programs. About 20% of the sample achieved scores of 4 or 5 (intense exposure), another 40% were substantially exposed (3), 12% somewhat exposed (2), and the rest either minimally exposed (1) or not exposed at all (0).

This scale does not depend on self-reported exposure to the campaign (ie. 'Did you hear any messages about ORT?') but on exposure to the channels on which the messages were known to have been broadcast. The indirectness may have increased the noise in the measure; it also avoided major problems in making inferences about causal direction. Typically, when the outcome is a behavior and the measure of exposure is recall of messages about the behavior, one is never sure whether an observed correlation between exposure and behavior reflects the effects of exposure on behavior or the effects of behavior on the tendency to recall exposure. By using exposure to channels (rather than messages) this particular threat to inference is reduced.

2. Interpersonal Channels. Three personal sources were expected to be carriers of diarrheal disease control messages: 1) health care professionals at the clinics and hospitals, 2) rural health motivators and other health extension agents who were likely to visit individual homesteads, and 3) individuals in communities who were given some SSS training and who displayed yellow flags to indicate that they could provide assistance. This last group may sometimes overlap with the second group.

Estimating exposure to such personal sources of information is, like exposure to radio, largely a matter of seeing what opportunities individuals have had for such exposures. The most common opportunity was at the clinic when caretakers brought their children under five years old for treatment of diarrhea. Caretakers are said to have had exposure if their contact with the clinic included all of the following elements: 1) contact with a clinic nurse, 2) during the previous six months, 3) for the treatment of the last case of diarrheal disease for a child under 5, and 4) treatment with rehydration solution for this case. Using that criterion, about 22% of the sample had high probability of contact with a nurse about campaign messages (called CLINIC).

In addition to the contact with clinic nurses, there were individual health extension workers who visited homes. It appears that such contact was frequent. Forty-two percent of the sample reported visits either by the Rural Health Motivator and/or by another health worker. However, diarrheal treatment was reported only rarely by 16% of the visited homesteads and 7% of the entire sample as the topic of such visits. Only the 7% were assumed to be exposed to diarrheal disease messages through this channel.

The last personal source checked was the one explicitly developed by the campaign: the yellow flag volunteer. Productive educational contact with these people was not common. While half the sample reported knowing that a yellow flag volunteer has something to do with health, and one-third reported that someone "around here" has such a flag, only one

respondent in eight reported personal contact with a volunteer. Virtually all of those people who had personal contact with a volunteer said that they learned about SSS from them. The infrequent contact with yellow flag volunteers reflects the limited reach of the training components of the campaign.

There was some overlap between the two types of outreach contact, thus a total of 16% of the sample reported out-of-clinic contact (called OUTREACH). Then, in total, 35% of the sample appeared to have had some sort of face-to-face contact about campaign messages. In contrast more than 60% of the sample were substantially exposed to the messages over radio.

3. Water-sugar-salt use. For this analysis, the dependent variable combines self-reported prior use of a rehydration solution with evidence about knowledge of how to mix it. Caretakers were asked "Have you ever used water-sugar-salt to treat your child's diarrhea?" Separately they had been asked (if they claimed that they knew) to describe the formula for mixing the solution. The correct answer was 8 bottle caps of sugar, 1/2 bottle cap of salt and 1 liter of water. If they said they had ever used the solution and knew the correct amounts of two of the three ingredients, they were considered knowledgeable ever users and were coded 1; otherwise they were coded as 0. About 42% of the sample satisfied this criterion after the campaign. (This can be compared with only 15% who did so before the campaign, clear evidence of its overall power.)¹

4. Control variables. In addition the analysis makes use of two sets of control variables. The first are dummy variables representing interviewers. There are statistically significant

¹ This choice for a dependent variable is appropriate for the points to be made in this chapter about channel effects. Without further discussion it should not be considered an appropriate criterion for project success since someone who was considered successful under this criterion could make inappropriate use of the solution, if the third ingredient was incorrect, or if the quantity used was too little.

differences among interviewers in the responses they obtained about diarrheal disease treatment. Also, to lessen some of the differences in treatment associated with socioeconomic status which also might be associated with access to channels, respondent's education (coded in years) was also controlled.

Estimation of Channel Effects

The relationships between control variables, channel variables and the rehydration use criterion is best summarized through a regression equation whose results are presented in Table 1. In that table, the control variables account for less than 3% of the variance accounted for; the channel variables as a set account for an additional 5%.

Table 1: Predicting "Ever Use" of SSS and Two or Three Ingredients Correct, Multiple Regression Results (N=431)

Predictors	Mean	S.D.	Add'l R ²	Cum. R ²	B	Beta	F
Interviewer Dummy Variables			2.2%	2.2%			
Education			.5	2.7	.118	.069	2.08
Exposure Variables			5.2	7.9			
OUTREACH	.17	.37			.201	.149	9.85
LISTEN	2.49	1.51			.034	.102	4.47
CLINIC	.22	.41			.181	.150	9.54
Constant					.298		

For the issues of this chapter the most interesting results are the unstandardized coefficients (B's) of the three channel variables. A convenient interpretation of the unstandardized coefficients is that they represent the number of units of change on the dependent variable associated with each unit of change on the particular independent variable. Respondents who were one unit apart on the OUTREACH variable would be, on the average, .201 units apart on the practice (EVER USE) variable. Concretely, since both the OUTREACH variable and the EVER USE variable are either 0 or 1, those who had contact with an outreach worker were about 20% more likely to have ever used the solution than those who had no contact, while knowing at least two ingredients.¹

Contact with a clinic nurse (CLINIC) appears to have had an effect of similar magnitude: those with contact were about 18% more likely to have used the solution than those without contact. At first glance radio use (LISTEN) appears to have had a lesser effect (its unstandardized coefficient is .034). However while both OUTREACH and CLINIC are 0-1 variables, LISTEN varies from 0 to 5. For each point respondents go up on the LISTEN scale they are likely to go up 3.4% in EVER USE. Thus contrasting respondents at the lowest and highest level of the LISTEN scale, the expected difference in EVER USE is 5×3.4 , or 17%. Again this is of a similar magnitude to the effects of each of the face-to-face channels.

Taken at face value, this would suggest that exposure to any of three channels more or less equally affected the probability of use of the rehydration solution. This result needs to be

¹ The unstandardized coefficients are unbiased when a dichotomous dependent variable is used in ordinary least squares regression (OLS), but hypothesis tests tend to be conservative. Their sampling error tends to be larger than it ought to be (Aldrich and Nelson, 1984). Since the magnitude of the channel coefficients are of major interest, since they are all significantly different from zero even with the inflated sampling error, and since readers may be more accustomed to reading the results of ordinary least squares regression rather than technically appropriate logistic regression the results are reported in OLS format.

combined with the earlier information about relative exposure to each of the channels: 16% were exposed to a yellow flag volunteer; 22% to a clinic nurse, but more than 60% were substantially exposed to radio. Considering the comparable effectiveness among channels but great disparity in reach, it appears that radio is the channel of the greatest power. This result stands in sharp contradiction to the conventional wisdom.

Interestingly, the effects of one channel are largely independent of the effects of the other channels: there are no significant interactions among the channels. The hypothesis that best fits the data is the Additive Hypothesis pictured in Figure 1C. Of course, given that this is only one project in one country, there is nothing conclusive to be said about the general dominance of one or another of the hypotheses.

These data about relative exposure also come from one country and project. Nonetheless they may well reflect more generally the contrasting reach to be achieved by a mass medium versus an interpersonal channel. Swaziland, with only 800,000 people, great ethnic homogeneity and a relatively small land mass, may have found it easier to rely on interpersonal channels than would many other countries with larger populations and greater diversity.

CONCLUSIONS

This chapter questioned the assumption that organized field agent networks must complement mass media broadcasts if a substantial effect on behavior is the target. It pointed to some doubts about real-life feasibility of organizing a field agent network as well as about the conceptual underpinnings and the empirical support for that proposition; then a study whose results challenge the assumption directly was presented. As part of the process there was an explicit statement of five alternative formulations of media competition hypotheses.

Most of the conceptual doubts and methodological questions have appeared elsewhere (cf. Schramm, 1977; Chaffee, 1972, 1982). However, the empirical study is fresh and addresses the research question more directly than much prior work. Nonetheless it is but one study in what will need to be a longer sequence if its conclusions are to be applied more broadly.

One additional issue worth some attention may be whether the channel competition framework is useful altogether. The crude version pitting channel versus channel which appears here has largely disappeared from the instructional design literature. When some educational scholars consider these issues they focus on issues of micro-instructional design: matching learning of particular conceptual elements with particular within or across-medium instructional strategies (cf. Schramm, 1977; Salomon, 1979). Nonetheless, crude as these comparisons have been, they bear on the explicit practices associated with public communication campaigns.

So long as the truism -- media for awareness, field agents for practice change -- is accepted, and so long as communication program planners fail to admit the improbability of organizing such agent networks, communication programs are unlikely to succeed as motivators of behavior change. Under this logic, broadcasters set themselves limited tasks of awareness improvement and leave the responsibility for practice change to field agents.

This limited perspective frees the mass media producers from the responsibility for developing specific messages which their audiences might use to solve real problems. It reduces their need to know in detail about their audiences, permitting them to emphasize the production values of their programs rather than those programs' efficacy in achieving worthwhile practice change. If there is no practice change achieved the response can be, "well, what can you do, that is the fault of someone else's failure to make the field agent structure work."

In fact, it appears that mass media channels, without field agents, can affect behavior. However they must be used by producers with detailed knowledge of audiences, with objectives reflecting the material possibilities for change among audiences, with enough resources to reach audiences frequently and clearly, and who are able to coordinate with the actions of other institutions.

A reader ought not leave this chapter with the sense that all public communication programs operate, in fact, under the awareness-only from mass media assumption, even though the literature so often declares it to be truth. Though I have not counted, I suspect that few public communication programs actually organize complementary field agent channels. Yet, for both field-agentless commercial advertising and much of the social advertising that is considered in this book, behavior change is expected. Perhaps it is time that the explicit models of change reflect both what we do and admit to the possibility that it might work, and figure out just how to realize the potential. If field agent structures can be organized in a particular context, that is well and good. Otherwise, the limits of what can be done through mass media alone are worth exploration.

In development communication, also, there has been a move away from the refusal to give broadcasts a practice-change role. There are a number of programs (sometimes called social marketing programs, although other labels would be as appropriate) which combine, for example, product distribution with multiple channel education. They expect each channel to affect behavior and the messages on them are designed accordingly, with heavy emphasis on making use of knowledge of audiences in strategy and materials development (cf. Academy for Educational Development, 1988).

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