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Citizens' acquisition of mass media information has long been a concern of social scientists and policy makers. The conventional wisdom that increasing the flow of information will ensure its widespread acquisition has been criticized based on studies showing inequitable information acquisition between groups of higher and lower socioeconomic status. The knowledge gap hypothesis, formalized in 1970, posits increasing differences in knowledge due to social structure-based inequities. Because of its important theoretical and policy implications, this hypothesis has generated considerable research and continues to concern social scientists and policy makers worldwide. This chapter reviews and critiques the development of the knowledge gap hypothesis over the past 25 years. Based on a comprehensive examination of studies, critiques, and dissertations, the authors identify the variables that potentially influence the gap phenomenon, the conditions under which gaps expand and contract, and areas that require further research. Finally, the authors evaluate the knowledge gap hypothesis as a scientific research program, using a sophisticated falsificationist perspective.

213

POLITICAL theorists have long contended that power is based in the spread and possession of knowledge and information. They have argued that the republican form of government is about making conscious choices and therefore have asserted the indispensability of an informed citizenry. In modern times, the mass media have developed as powerful

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*Communication Yearbook 19*, pp. 187-227

187

instruments of information and knowledge propelling social and political influence. In the second half of the twentieth century, their pivotal role has continued to unfold, especially in light of national preferences for strategies of planned, rational change to manage political, social, and economic issues and problems.

Following the emergence of empirical social science, however, researchers have frequently observed that information and knowledge seldom spread equitably to all groups within social systems. "Gaps" in knowledge or information have been consistently found between social groups, whether involving information of a general nature or communication campaigns seeking some intended effect. Early such evidence was found by Hyman and Sheatsley (1947), who first observed the difficulty of reaching some groups—which they labeled "chronic know-nothings"—with any information. A few years later, Star and Hughes (1950) reported that a campaign to inform Cincinnati citizens about the United Nations resulted in the inequitable distribution of information. People with more formal education gained information from the campaign, but their less educated counterparts benefited little. Many subsequent studies, such as the "Coleman report" on the equality of educational opportunity (Coleman et al., 1966; Mosteller & Moynihan, 1972) and evaluations of public television's *Sesame Street* (Ball & Bogatz, 1970; Cook et al., 1975; Katzman, 1974) and other purposive communication projects (Hornik, 1989; Rogers, 1976; Roling, Ascroft, & Wa Chege, 1976), have found similar unintended outcomes favoring information "haves" over "have-nots." These studies have raised serious questions about the nature of such gaps, whether and how they might be bridged, and whether and how the phenomenon constrains the capacity of democratic social systems to manage change and conflict and to make informed decisions.

Tichenor, Donohue, and Olien in 1970 formalized this research finding as the *knowledge gap hypothesis*: "As the infusion of mass media information into a social system increases, segments of the population with higher socio-economic status tend to acquire the information at a faster rate than the lower status segments, so that the gap between these segments tends to increase rather than decrease" (pp. 159-160). This was an important formalization and expansion of previous findings because it proposed that media-generated publicity flowing into a community potentially increased knowledge disparities between social groups rather than reduced them. It ran counter to the general expectation of information campaign effects by proposing that purposive communication would most often benefit the "information rich" and disadvantage the "information poor" (Price & Zaller, 1993).

Since its formal articulation 25 years ago, the knowledge gap hypothesis has generated strong interest among social scientists and policy makers in the United States and worldwide. This interest in knowledge gap research has been steadily increasing in the past quarter century. For example, our data show that there have been *at least* 70 pieces published on the knowledge gap

hypothesis recently. In second dec 1990-1994 continuing as the basi gested, kn systems. T capacity o (Donohue,

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hypothesis over the past 25 years, and the number of studies has increased recently. In fact, in the first decade, 1970-1979, there were 13 studies; in the second decade, 1980-1989, there were 32 studies; and in the last half decade, 1990-1994, there have already been 26 studies, including dissertations.<sup>1</sup> The continuing concern of this line of research is about knowledge and its control as the basis of social power and social action. As theorists have long suggested, knowledge inequities are a profound concern in democratic social systems. They may lead to serious power differentials and reflect on the capacity of such systems to serve the needs of all their members equitably (Donohue, Olien, & Tichenor, 1987; Olien, Donohue, & Tichenor, 1983).

Dozens of studies have examined the knowledge gap phenomenon, seeking to test the hypothesis at least implicitly and to refine, modify, and even expand it.<sup>2</sup> In this chapter, we review the important issues raised by knowledge gap research. Specifically, we review empirical studies, commentaries, and critiques of this research generated since 1970. Finally, we evaluate the scientific integrity of the research program, using the "sophisticated falsificationist" perspective described by Lakatos (1968). Issues reviewed here include the following:

1. contingent conditions that affect knowledge gaps, including differences in topics and content domains, their functionality and geographic scope, complexity of knowledge, channel influence differences, and the role of media publicity in campaign and noncampaign communication;
2. macrosocial contrasted with individual-level explanations for knowledge gaps;
3. conceptual and methodological issues in study design, operational definitions, and measurement;
4. ideological considerations, including the meaning of gaps and how they occur; and
5. the development of the knowledge gap hypothesis as a formal research program in mass communication studies.

## METHODS

In reviewing each study, we took the following key characteristics (Gaziano, 1983) into account: (a) the author(s), (b) date or year of the study, (c) topic or content domain (local, national, or international; science, health, or public affairs), (d) whether the study dealt with a campaign or a secular topic, (e) study design, (f) measurement of knowledge, (g) type of knowledge measured, (h) type of the community, (i) place or location of the study, and (j) medium. For this review we located as much of the published work as possible through *Social Science Citations Index*, *Sociological Abstracts*, *Psychological Abstracts*, and the Education Resources Information Clearinghouse. We also used the reference lists in the articles we found to locate fugitive materials. Gaziano's (1983) review was especially helpful in this regard. We located three kinds of articles: (a) those that examined knowledge

gap explicitly; (b) those that looked at correlations between education and knowledge, and social class and knowledge; and (c) critical reviews of and commentaries on the hypothesis itself.

### EARLY REFINEMENTS AND REVISIONS

Using formal schooling as a socioeconomic status (SES) indicator, early studies supported the knowledge gap hypothesis in certain topical areas, including public affairs, science, space research, and health. Some studies examining news diffusion also showed that education was related to current-events knowledge (DeFleur, 1987). Soon, however, studies emerged that did not appear to support the hypothesis as originally formulated. Some studies in the United States and in India did not find widening gaps (Ettema & Kline, 1977; Shinghi & Mody, 1976), and a rare few even found reverse gaps, in which those with less formal education demonstrated greater knowledge than those with more education (Douglas, Westley, & Chaffee, 1970; Fathi, 1973). These developments led researchers to consider contingent conditions constraining the intractability of knowledge gaps. This work raised new issues with somewhat more optimistic implications, especially for communication campaigns (Clarke & Kline, 1974; Dervin, 1980; Ettema & Kline, 1977; Friemuth, 1989).

Revising the original hypothesis, Donohue, Tichenor, and Olien (1975) drew attention to several relevant conditions affecting knowledge gaps: the geographic scope of a topic or issue, its local community impact, the conflict level surrounding a topic or issue, social structure, and information flow (amount and repetition of topical information in a social system). Ettema and Kline (1977) sought further refinements in individual-level conditions. They proposed that knowledge gaps are due to social group differences in motivation to acquire information and the lack of relevance and utility of much media-generated information for individuals in lower-SES groups. They also argued that "ceiling effects" on knowledge among higher-SES groups could produce conditions permitting lower-SES groups to catch up and thereby close gaps in social group differences in knowledge.

In an extensive review, Gaziano (1983) examined the role of variables such as topic type and geographic scope, operational definitions of knowledge, types of communication channels studied, and research design and data collection methods.

### CONTENT DOMAIN AND INFORMATION UTILITY

Supporting Ettema and Kline (1977), a number of studies have reported gaps in public affairs knowledge between lower- and higher-SES groups.

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among those differing in topical interest (Delli-Carpini, Keeter, & Kennamer, 1994; Fredin, Monnett, & Kosicki, 1994; Fry, 1979; Gaziano, 1983; Genova & Greenberg, 1979; Horstmann, 1991; Kanervo, 1979; Kleinnijenhuis, 1991; McLeod & Perse, 1994; Moore, 1987; Pan, 1990; Robinson, 1972; Robinson & Levy, 1986; Rucinski & Ryu, 1991; Simmons & Garda, 1982; Tichenor, Donohue, & Olien, 1980; Wade & Schramm, 1969). Some studies also have shown differences in learning from news between those reporting previous knowledge of a topic and those reporting little or no previous knowledge (Price & Zaller, 1993; Robinson & Levy, 1986).

Donohue et al. (1975) studied knowledge about the environment and found gaps between different education groups. At least two other studies also found large gaps on environmental topic knowledge (Griffin, 1990; Lovrich & Pierce, 1984). In these three studies (Donohue et al., 1975; Griffin, 1990; Lovrich & Pierce, 1984), the researchers also found that knowledge gaps narrowed over time. These studies suggest that narrowing gaps may be due to heightened salience caused by increased community conflict over the issues examined. Such conflict may activate public discussion, leading to a more equitable distribution of information (Donohue et al., 1975; Lovrich & Pierce, 1984). In the study by Griffin (1990), declining media publicity may also have resulted in narrowing gaps.

Health knowledge, a topic of nearly universal interest, has received considerable study. The very first article on the knowledge gap reported SES-based knowledge differences about the link between smoking and cancer (Tichenor et al., 1970). Other studies have also reported SES- or motivation-based knowledge differences (Butler, 1990; Chew & Palmer, 1994; Douglas & Stacey, 1972; Erskine, 1963; Gallup Omnibus, 1977; Horowitz, 1992; Nazzaro, 1989; Snyder, 1990; Yows, Salmon, Hawkins, & Love, 1991; Zandpour & Fellow, 1992), although gaps have narrowed in some cases as a result of community campaigns in both developed (Ettema, Brown, & Luepker, 1983) and developing nations (Galloway, 1977).

Longitudinal studies of health knowledge have reported that gaps usually expand initially but close over time. These studies suggest that gaps are less likely if a topic involves communities, if an issue is defined by powerful groups as a significant problem, if communities are sufficiently pluralistic to provide specialized information (Donohue, Olien, & Tichenor, 1990; Finnegan, Viswanath, Kahn, & Hannan, 1993; Viswanath, 1990; Viswanath, Finnegan, Hertog, Pirie, & Murray, 1994; Viswanath, Finnegan, & Kahn, 1993), or if special promotional efforts have encouraged widespread exposure (Chew & Palmer, 1994). One study found that over time there were no SES-based differences in the acquisition of information, but also found differences in information retention (Snyder, 1990).

Studies have also examined other topical areas. In a study of knowledge gaps in a developing country, Galloway (1977) found narrowing gaps in knowledge of 10 agricultural innovations. Genova and Greenberg (1979)

found SES-based knowledge differences on a sports-related topic (an NFL players' strike).

In summary, the evidence suggests that knowledge gaps may be found in both public affairs and non-public affairs topics (Table 5.1). Although content domain is important, research suggests there are other factors that influence knowledge gaps, including social conflict, media access, knowledge complexity, and community social structure.

### COMMUNITY BOUNDEDNESS

Researchers have observed that the more an issue or topic is defined as important to a local community, the fewer knowledge gaps will exist between SES groups in that community. This idea of *community boundedness* may also affect knowledge gaps in communities not defined geographically but by some other common characteristic, such as ethnicity or association—"communities without propinquity" (Webber, 1963). Delli-Carpini et al. (1994), for example, found that although residents of northern Virginia knew less about their state than did residents of Richmond, the state capital, they were better informed about national issues. These results undoubtedly were due to the influence of Washington, D.C., media in northern Virginia and the fact that many residents of that part of the state work in Washington.

Several studies of issues important to local communities have reported a "slight tendency" for fewer SES-based knowledge gaps (Becker & Whitney, 1980; Donohue et al., 1975; Palmgreen, 1979; Viswanath, Kosicki, Park, & Fredin, 1993). On the other hand, Gaziano (1984) found knowledge of local interest topics to vary between groups of differing education. A Swedish study by Brantgarde (1983) reports more modest gaps on local issues.

On the other hand, several studies of nonlocal issues have reported enduring SES-based gaps (Clarke & Kline, 1974; Donohue et al., 1975; Genova & Greenberg, 1979; Gunaratne, 1976; Moore, 1987; Robinson, 1972). Gandy and El Waylly (1985) and other investigators have reported SES-based gaps in knowledge on international topics both in the United States and abroad (Gunaratne, 1976; McNelly & Molina, 1972; McNelly, Rush, & Bishop, 1968; Robinson, 1967, 1972; Star & Hughes, 1950). Along these lines, Brantgarde (1983) found that better-educated persons reporting greater exposure to national issues were also likely to demonstrate greater knowledge of local issues.

A recent study examined knowledge gaps between African Americans and the majority population on an issue involving civil rights and crime. The authors report that gaps were less likely among African Americans, compared with the majority population, because the issue was of greater immediate relevance to their community (Viswanath, Kosicki, et al., 1993).

TABLE 5.1  
Summary of Studies Reporting Impact  
of Major Explanatory Variables on Knowledge Gaps

| <i>Contingent Variable</i>     | <i>Studies Demonstrating<br/>Presence or Enduring Gaps</i>   | <i>Studies Demonstrating<br/>Absence or Narrowing Gaps</i>   |
|--------------------------------|--|--|
| <b>Nature of the topic</b>     |  |  |
| Content domain                 |  |  |
| public affairs                 | Fredin et al., 1994; Price & Zaller, 1993; Robinson & Levy, 1986; see also diffusion studies cited in DeFleur (1987)   |  |
| environment <sup>a</sup>       | Donohue et al., 1975; Griffin, 1990; Lovrich & Pierce, 1984  | Donohue et al., 1975; Griffin, 1990; Lovrich & Pierce, 1984  |
| health                         | Butler, 1990; Chew & Palmer, 1994; Douglas & Stacey, 1972; Erskine, 1963; Gallup Omnibus, 1977; Horowitz, 1992; McDivitt, 1985; Nazzaro, 1989; Snyder, 1990; Tichenor et al., 1970; Yows et al., 1991; Zandpour & Fellow, 1992 | Chew & Palmer, 1994; Donohue et al., 1975; Ettema et al., 1983; Galloway, 1977; Snyder, 1990; Viswanath, 1990; Viswanath, Finnegan, & Kahn, 1993 |
| agriculture                    | Hornik, 1989   | Galloway, 1977   |
| sports                         | Genova & Greenberg, 1979   |  |
| Community boundedness          |  |  |
| local issues                   | Brantgarde, 1983; Gaziano, 1984  | Becker & Whitney, 1980; Donohue et al., 1975; Palmgreen, 1979; Viswanath, Kosicki, et al., 1993b   |
| nonlocal or statewide issues   | Delli-Carpini et al., 1994; Donohue et al., 1975; Moore, 1987  |  |
| international issues           | Brantgarde, 1983; Gandy & El Waylly, 1985  |  |
| <b>Complexity of knowledge</b> |  |  |
| Awareness or simple knowledge  |  | Galloway, 1977; Viswanath et al., 1994   |
| Complex knowledge              | Gaziano, 1984; Genova & Greenberg, 1979; Moore, 1987; Price & Zaller, 1993; Snyder, 1990; Spitzer & Denzin, 1965; Viswanath et al., 1994   |  |

(continued)

TABLE 5.1  
Continued

| <i>Contingent Variable</i>   | <i>Studies Demonstrating Presence or Enduring Gaps</i>   | <i>Studies Demonstrating Absence or Narrowing Gaps</i>  |
|--|--|---|
| <b>Role of publicity</b>   |  |   |
| Increasing flow of information into a system, either because of campaigns or for "secular" (noncampaign) reasons | Cook et al., 1975; Donohue et al., 1990; Hornik, 1988; Moore, 1987; Mosteller & Moynihan, 1972; Nazzaro, 1989; Rogers, 1983; Snyder, 1990; Star & Hughes, 1950; Viswanath, Finnegan, & Kahn, 1993 <sup>b</sup> | Chew & Palmer, 1994; Donohue et al., 1975; Ettema et al., 1983; Greenberg, 1964; Griffin, 1990; Spitzer & Denzin, 1965; Viswanath, 1990; Viswanath et al., 1994; Viswanath, Finnegan, & Kahn, 1993                                    |
| <b>Channel influence</b>   |  |   |
| Print media (exposure) <sup>c</sup>  | Gaziano, 1984; <sup>d</sup> Griffin, 1990; Kleinnijenhuis, 1991; McLeod & Perse, 1994; Price & Zaller, 1993; <sup>e</sup> Robinson, 1972; Simmons & Garda, 1982  | Gandy & El Waylly, 1985; Gaziano, 1984  |
| Television   | Gandy & El Waylly, 1985; Griffin, 1990; Gunter, 1987; Horstmann, 1991; McLeod & Perse, 1994; Shinghi et al., 1982; Simmons & Garda, 1982   | Brantgarde, 1983; Chew & Palmer, 1994; Galloway, 1977; Gantz, 1978; Kleinnijenhuis, 1991; Miller & MacKeun, 1979; Mulugetta, 1986; Neuman, 1976; Sharp, 1984; Shinghi et al., 1982; Shinghi & Mody, 1976; Tomita, 1989; Torsvik, 1972 |
| Newspapers versus television <sup>f</sup>  | Clarke & Fredin, 1978; Lang & Lang, 1984; McLeod & Perse, 1994; Price & Zaller, 1993; Simmons & Garda, 1982  |   |
| Interpersonal discussion <sup>g</sup>  |  | Donohue et al., 1975; Galloway, 1977; Genova & Greenberg, 1979; Griffin, 1990; Hornik, 1989; Horstmann, 1991; Price & Zaller, 1993; Robinson & Levy, 1986; Roy et al., 1969   |
| <b>Individual-level variables<sup>h</sup></b>  |  |   |
| Interest   | Genova & Greenberg, 1979; Horstmann, 1991; McLeod & Perse, 1994; Neuman, 1976; Pan, 1990   |   |
| Importance and threat  | Ettema et al., 1983  |   |
| Involvement  | Salmon, 1985   |   |

(continued)

TABLE 5.1  
Continued

| <i>Contingent Variable</i>  | <i>Studies Demonstrating Presence or Enduring Gaps</i>  | <i>Studies Demonstrating Absence or Narrowing Gaps</i>  |
|---|---|---|
| Concern and salience  | Chew & Palmer, 1994;<br>Ettema et al., 1983;<br>Nazzaro, 1989; Zandpour & Fellow, 1992  |   |
| Cognitive schemata  | Fredin et al., 1994   |   |
| Individual participation  | Horstmann, 1991; Lovrich & Pierce, 1984   |   |
| Individual-level variables versus SES with greater association between knowledge and SES compared with interest and knowledge | Gandy & El Waylly, 1985;<br>Gaziano, 1984; Griffin, 1990; McLeod & Perse, 1994; Price & Zaller, 1993; Rucinski & Ryu, 1991; Simmons & Garda, 1982; Snyder, 1990; Viswanath, Kahn, et al., 1993; Yows et al., 1991 |   |
| <b>Macro-level variables</b>  |   |   |
| Homogeneous communities   | Pearson, 1990; Viswanath et al., 1994; Viswanath, Finnegan, & Kahn, 1994  | Donohue et al., 1975; Douglas et al., 1970; Ettema et al., 1983; Galloway, 1977; Olien et al., 1983; Shinghi & Mody, 1976; Tichenor, Donohue, & Olien, 1973, 1980 |
| Heterogeneous communities   | Donohue et al., 1975; Gandy & El Waylly, 1985; Olien et al., 1983; Tichenor et al., 1973, 1980  | Melwani et al., 1994; Viswanath et al., 1994; Viswanath, Finnegan, & Kahn, 1993   |
| Social conflict and mobilization  | Frazier, 1986; Gaziano, 1984; Lovrich & Pierce, 1984  | Donohue et al., 1975; Frazier, 1986; Genova & Greenberg, 1979; Tichenor et al., 1980  |
| Participation and involvement with groups   |   | Brantgarde, 1983; Galloway, 1977; Gaziano, 1984   |
| Degree of control <sup>i</sup>  |   | Ettema et al., 1983; Galloway, 1977; Olien et al., 1983; Shinghi et al., 1982; Shinghi & Mody, 1976   |
| <b>Conceptual and methodological influences</b>   |   |   |
| Ceiling effects   |   |   |
| simple measures   |   | Donohue et al., 1990; Ettema & Kline, 1977; Galloway, 1977; Greenberg, 1964; Spitzer & Denzin, 1965; Viswanath et al., 1994                                       |

(continued)

TABLE 5.1  
Continued

| <i>Contingent Variable</i>                    | <i>Studies Demonstrating Presence or Enduring Gaps</i>  | <i>Studies Demonstrating Absence or Narrowing Gaps</i>   |
|---|---|--|
| complex measures                              | Donohue et al., 1990;<br>Moore, 1987  |  |
| Operational measure of knowledge <sup>j</sup> |   |  |
| closed-ended                                  | gaps usually reported; e.g.,<br>Chew & Palmer, 1994;<br>Ettema et al., 1983;<br>Galloway, 1977; Genova<br>& Greenberg, 1979   |  |
| open-ended                                    | Benton & Frazier, 1976;<br>Clarke & Kline, 1974;<br>Donohue et al., 1975;<br>Edelstein, 1973; Finnegan<br>et al., 1990; Gandy &<br>El Waylly, 1985; Gaziano,<br>1983, 1984; Lovrich &<br>Pierce, 1984; McLeod et al.,<br>1988; Viswanath, Finnegan,<br>& Kahn, 1993 | Palmgreen, 1979; <sup>k</sup> Viswanath,<br>Finnegan, & Kahn, 1993   |
| Study design                                  |   |  |
| one-shot studies                              | most diffusion studies; see<br>also Donohue et al., 1975;<br>Finnegan et al., 1988, 1990;<br>Gandy & El Waylly, 1985;<br>Gaziano, 1984; Tichenor<br>et al., 1980  |  |
| longitudinal                                  | Cook et al., 1975; Moore,<br>1987; Pan, 1990; Price &<br>Zaller, 1993; Snyder, 1990;<br>Viswanath, 1990; <sup>l</sup> Viswanath<br>et al., 1994; Viswanath,<br>Finnegan, & Kahn, 1993   | Abbott, 1978; Bailey, 1971; Bogart,<br>1957-1958; Chew & Palmer,<br>1994; Donohue et al., 1975;<br>Douglas et al., 1970; Ettema<br>et al., 1983; Galloway, 1977;<br>Gaziano, 1983, 1984; Genova &<br>Greenberg, 1979; Griffin, 1990;<br>Horstmann, 1991; Mulugetta,<br>1986; Shinghi & Mody, 1976;<br>Star & Hughes, 1950; Viswanath,<br>1990; Viswanath et al., 1994;<br>Viswanath, Finnegan, & Kahn,<br>1993 |

NOTE: Caution is advised in interpreting this table. The findings in the studies cited have been simplified for ease of reporting and are intended only to indicate and summarize findings in the broadest sense. The complexity of the findings is discussed in greater detail in the text. Although most of the relevant studies are cited here, the entries are not exhaustive.

a. Gaps were found initially, but they narrowed over time, as reported in the third column.

b. Gaps narrowed on campaign-emphasized knowledge initially, whereas they widened in the topics not emphasized in the campaigns.

c. These studies found positive association between knowledge and print media exposure and reported knowledge gaps between readers and nonreaders.

d. Gaziano (1984) also reports gaps between high and low educational groups among the readers.

TABLE 5.1  
Continued

- 
- e. Reduced to nonsignificance in a multivariate model.
  - f. These studies reported stronger association between newspaper exposure and knowledge and widening gaps between those exposed to newspapers compared with those exposed to television.
  - g. Few studies in knowledge gap actually used interpersonal communication as a variable. Among those that did examine the variable, a narrowing of gaps as a result of interpersonal discussion was reported.
  - h. Most studies reported greater gaps between those who were interested or motivated and those who were not interested or not motivated. Some compared the predictive power of a micro-level variable, such as interest or salience, with education, as shown below.
  - i. This variable was not the explicit focus in any study. It has been offered as an *ex post facto* explanation by some for the success of campaigns that reduced knowledge gaps (Viswanath et al., 1991).
  - j. In general, whether it is an open-ended or closed-ended measure of knowledge does not appear to matter.
  - k. For local affairs knowledge only.
  - l. Viswanath and his colleagues reported the effects of campaigns on knowledge gaps in three community pairs over time and, in general, reported that gaps closed initially on most issues, whereas they widened on certain other issues.
- 

To summarize, the research clarifies that knowledge gaps are less likely to be found on issues defined as important to communities whether communities are defined geographically or by some other nongeographic common characteristic (see Table 5.1). On community ties and knowledge gaps, Pearson (1993) found that length of residence and political activity were related to knowledge among rural Alaskans, whereas organizational membership was related to knowledge among urban Alaskans. Local political activity was related to knowledge in all three samples: rural Alaskans, urban Alaskans, and Anchorage residents. Although Viswanath, Kosicki, et al. (1993) did not find support for the proposition that community ties are related to knowledge gaps, they note that community boundedness of the issue, which is related to community orientation, may provide a basis for understanding differences on certain issues. The relationship between community ties and orientation to media use is, of course, well documented in the literature (Stamm, 1985; Stamm & Fortini-Campbell, 1983; Stamm & Weiss, 1983; Viswanath, Finnegan, Rooney, & Potter, 1990).

#### DEPTH OF KNOWLEDGE

Knowledge gaps frequently differ based on type of knowledge measured. SES-based gaps are usually observed when knowledge is measured as more than simple familiarity with an issue. Research suggests that gaps rarely narrow due to increased publicity. However, research also suggests that serious SES-based differences are less likely to be found when knowledge is defined simply, for instance as awareness of an event or program (Galloway, 1977; Viswanath et al., 1994).

Evidence from many studies points to gaps based on education and interest for in-depth knowledge, that is, respondents' deeper understanding of an event's relationships, causes, or larger context. The study by Genova and

Greenberg (1979) on knowledge of the National Football League strike and the charges against President Richard Nixon and Gaziano's (1984) study of in-depth knowledge of crime, housing, economic development, and schools report both education-based and interest-based gaps. Sustained media attention because of information campaigns or an event's inherently high news value has been found to lead to narrowing gaps, but wider education-based differences in depth knowledge have also been observed (Snyder, 1990; Spitzer & Denzin, 1965; Viswanath et al., 1994). Some studies have also reported larger education-based gaps on more complex topics, including taxation policies, nuclear power plant user fees, and health insurance, whereas smaller gaps were apparent on less complex issues, such as "broad-based taxes" and an airline disaster (Moore, 1987; Price & Zaller, 1993).

Knowledge complexity thus appears to influence SES-based gaps. Although increasing conflict and salience may equalize general knowledge of an issue or topic, gaps appear to continue or even to widen for in-depth issue knowledge. The research suggests some reasons for this. Higher formal education provides a "trained capacity" to follow certain issues, to relate these to other similar events and causes, and to comprehend their significance. In addition, members of higher-SES groups are more likely to have extensive contact networks and access to information through organizational memberships and other sources (Gaziano, 1984; Hyman, Wright, & Reed, 1975; Price & Zaller, 1993), which may reinforce their interest and knowledge (Dorohue et al., 1975). They are thus in a better position to supplement mass media information with organizational and interpersonal sources to gain more in-depth understanding of issues. In short, the advantage of the "information rich" would seem to derive from greater resources, both personal (as a function of the capacity-building effect of education) and external (as a function of greater access to information sources).

### THE ROLE OF PUBLICITY

The role of publicity is a key concept in knowledge gap research. A widely shared proposition is that increased publicity, and the consequent information repetition, is sufficient stimulus for people to develop knowledge and to use it purposively. A central issue, therefore, is whether planned efforts such as campaigns are capable of equalizing the distribution of information throughout populations. Some propose that traditional knowledge gaps may abate if publicity or campaigns are intense enough or long enough (Moore, 1987).

The evidence supporting this proposition is mixed (see Table 5.1). Lending support to the proposition, heart disease prevention campaigns have reduced education-based knowledge gaps and resulted in respondents' learning about a heart health program (Ettema et al., 1983; Viswanath et al., 1994). Earlier studies also found that concentrated media attention tended to equalize

knowledge of a news event (Greenberg, 1964; Spitzer & Denzin, 1965). A study of a campaign that encouraged participation in a program aimed at changes in diet and cancer prevention found that initial SES-based gaps narrowed modestly over time (Chew & Palmer, 1994). Paradoxically, declines in media publicity may also sometimes be associated with reductions in knowledge gaps (Donohue et al., 1975; Griffin, 1990).

In contrast, the literature is also replete with studies that echo early evidence that media publicity often has few such effects on knowledge (Moore, 1987). Some studies from the perspectives of innovation diffusion, social interventions, and campaign research have shown limited effects (Cook et al., 1975; Hornik, 1988; Mosteller & Moynihan, 1972; Nazzaro, 1989; Rogers, 1976, 1983; Snyder, 1990; Star & Hughes, 1950; Viswanath, Finnegan, & Kahn, 1993).

To help clarify these mixed results, a couple of tentative generalizations may be drawn from these and other studies. First, media publicity, when accompanied by increased salience, is usually at least partially successful in equalizing knowledge levels. Salience often increases due to conflict or controversy surrounding an issue, especially involving struggles over power of some kind. This kind of increased salience may activate interpersonal and community group contacts to intensify discussion of an issue.

Second, media publicity may also at least partially contribute to equalizing knowledge on topics that are generally accepted as important national issues and are therefore covered continuously by the media. These issues have enjoyed long, widespread acceptance as meriting public attention even though they may pose conditions of little immediate conflict or struggle to communities or to the nation as a whole. Some broad health issues, such as heart disease and cancer prevention, appear to fall into this category (Viswanath, Finnegan, Hannan, & Luepker, 1991). These issues attract attention initially from social elites, including scientists, policy makers, and other opinion leaders. For example, although there were SES-based knowledge differences on the health effects of smoking beginning with the U.S. surgeon general's report in 1964, decades of increased research, activism, policy making, and media coverage have resulted in broad awareness of the issue (Donohue et al., 1990). Although this has not in itself eliminated class-based behavioral differences (members of lower-SES groups are more likely to smoke today than are members of higher-SES groups), differences in knowledge and behavior have narrowed substantially over 30 years. The implication for the knowledge gap hypothesis is that when issues transform from particular to general and communal interest, the tendency is for SES-based knowledge gaps to decrease (see Hilgartner & Bosk, 1988).

These generalizations add a couple of refinements to our understanding of knowledge gaps. First, the transformation of issues in their acceptance by the population as of constant and general import may occur over long periods. Therefore, the equalization of knowledge among SES groups may often be a

long-term rather than a short-term phenomenon. Second, knowledge is not static. New knowledge is created and disseminated perpetually, especially through science, and SES-based knowledge gaps will continue to be observed even on issues long accepted as important.

### CHANNEL INFLUENCE AND KNOWLEDGE GAPS

Research has also suggested that media reliance or dependence and the characteristics of individual media and other communication channels can affect knowledge gaps. Evidence about channel influence has emphasized mainly the role of print media, the comparative effectiveness of print and broadcast media, and the potential of television as a knowledge equalizer (see Table 5.1).

Some have argued that print mass media (newspapers, magazines, books) can significantly increase knowledge gaps. Reasons include their middle-class orientation (Robinson, 1972; Tichenor et al., 1970) and the fact that higher-SES groups are more dependent on them, whereas lower-SES groups depend more on television (Bogart, 1981; Robinson, 1972; Tichenor et al., 1970). Further, print media permit much more in-depth coverage than do electronic media, and those who depend on print spend more time with print media than do others (Kleinnijenhuis, 1991). Support for the association between knowledge and print media exposure comes from many studies (Gandy & El Wayly, 1985; Gaziano, 1984; Griffin, 1990; Kleinnijenhuis, 1991; McLeod & Perse, 1994; Mulugetta, 1986; Pan, 1990; Price & Zaller, 1993; Robinson, 1972; Simmons & Garda, 1982). Gaziano (1984) found that education-based knowledge gaps were greater among newspaper nonreaders than among readers.

In contrast, some studies have focused on the role of television in reducing knowledge gaps. Two issues are important in this research. First, does television reduce gaps? Second, if so, are the effects the same for simple and in-depth information (Miyo, 1983; Mulugetta, 1986)? Neuman (1976) offers several reasons television may bridge knowledge gaps. First, television viewing—unlike other media use—is not well correlated with education. Second, members of lower-SES groups tend to prefer to get their news from television rather than from other sources. Third, the motivations people have for viewing television are different from their motivations for using other media. Fourth, the nature of viewing television is analogic rather than random access. That is, television viewers are less able than other media users to be selective about viewing some news stories and not others.<sup>3</sup>

In a study of story recall of network news, Neuman (1976) found no significant education-based differences either in content or story type recall. The only difference he found was related to interest in news. Those seeking to stay informed recalled more stories than did casual viewers. However, this

study was limited by some important omissions. It did not analyze knowledge of specific subjects, whether respondents supplemented their television viewing with other sources, or differences between those who watched and those who did not. This last point is key, because people who did not view network news on the day of the interview were excluded from the sample. However, this study still makes an insightful point: When television viewing occurs, education-based gaps are less likely. Other studies in the United States and in developing nations have supported this finding (Brantgarde, 1983; Chew & Palmer, 1994; Galloway, 1977; Gantz, 1978; Kleinnijenhuis, 1991; Miller & MacKeun, 1979; Miyo, 1983; Sharp, 1984; Shinghi & Mody, 1976; Tomita, 1989; Torsvik, 1972).<sup>4</sup>

In contrast, some studies have found television use to be negatively related to knowledge (Gandy & El Wayllly, 1985; Griffin, 1990; Gunter, 1987; Horstmann, 1991; McLeod & Perse, 1994; Simmons & Garda, 1982). Gandy and El Wayllly (1985) report that African Americans in their study reported watching more TV yet scored lower on knowledge. One study from India reports mixed results: Although television viewing was associated with narrowing gaps in a "backward" village, it was associated with larger gaps in a "progressive" village (Shinghi, Kaur, & Rai, 1982).

Studies that have compared newspaper use with television use usually have shown that print is more strongly associated with both simple and in-depth knowledge (Clarke & Fredin, 1978; Lang & Lang, 1984; McLeod & Perse, 1994; Price & Zaller, 1993; Simmons & Garda, 1982). In an election study, less educated people who preferred newspapers appeared to gain more than did more highly educated respondents (Mulugetta, 1986). The caveat here is that education level is generally associated with newspaper reading. The few studies that have not found an association between education and local newspaper use have reported that metro or regional newspaper use is associated with education (Donohue, Tichenor, & Olien, 1986). This implies that gaps may open on certain issues between "cosmopolites" who read regional papers and those who do not (Merton, 1968).

The more common finding in the literature, however, is that although television has the potential to increase knowledge among lower-SES groups, its record as an information provider has been poor because it has emphasized entertainment rather than learning (Gunter, 1987; Robinson & Levy, 1986), especially compared with other media (see also Becker & Whitney, 1980; Clarke & Fredin, 1978; and Kennamer, 1983, and Robinson, 1976, both cited in Robinson & Levy, 1986).

Research has also suggested the importance of interpersonal discussion in affecting knowledge gaps, although its precise impact is unclear despite calls for research in this area (Chaffee, 1972). The general proposition is that interpersonal discussion may be activated as a function of increased issue salience caused by social conflict and/or heavy media publicity. The result is that information about the issue will diffuse more rapidly among all social

groups, helping to equalize knowledge. Interpersonal discussion thus plays a role in propelling, if not accelerating, this process through reinforcement of media-generated information (Childers, 1975; Donohue et al., 1975; Hornik, 1989). It appears that media exposure supplemented by interpersonal discussion is highly effective in equalizing knowledge in both developed and developing nations (Galloway, 1977; Genova & Greenberg, 1979; Griffin, 1990; Horstmann, 1991; Price & Zaller, 1993; Robinson & Levy, 1986; Roy, Waisanen, & Rogers, 1969). Participation in organizations (Brantgarde, 1983; Gaziano, 1984) and other community attachments (Finnegan et al., 1990) are also perhaps associated with increased knowledge. Considerable evidence from research on the diffusion of innovations also points to the importance of interpersonal communication (Rogers, 1983).

The evidence about interpersonal communication thus far suggests the need for more systematic study. Two directions offer promising avenues for refining the hypothesis. First, how are knowledge gaps affected by interpersonal communication between similar and dissimilar audiences? Second, does the role played by interpersonal communication differ between heterogeneous and homogeneous communities? A recent study provides some initial groundwork to address these questions. Melwani, Viswanath, Becker, and Kosicki (1994) argue that weaker social ties in heterogeneous communities may be advantageous because they allow interaction among people with "diverse interests and knowledge enabling learning on specialized topics." This is the idea of the strength of "weak ties" (Granovetter, 1973). On the other hand, closer ties and homogeneity of interests in less pluralistic systems could be disadvantageous to learning new information.<sup>5</sup> If investigators find empirical evidence for these ideas, it will certainly help to refine major axioms of the knowledge gap hypothesis.

In summary, findings on channel influence and the knowledge gap are inconclusive and suggest needed areas of study. It is possible that when exposure is equal, information gains are comparable (Robinson, 1972). But exposure itself is usually related to other factors, including SES and arousal as a function of social conflict or organized activity. More important, however, are reasons for use of specific media in the first place. If media use is purposive and equal across social groups, knowledge differences are much less evident (Chaffee, Ward, & Tipton, 1970; see also Pearson, 1993). However, there are differences in media attention, use, and information processing, especially in the case of print media. Loges and Ball-Rokeach (1993) found that in their sample, the affluent and the less affluent read newspapers for different reasons. Subjects in the higher-income group were more likely to read newspapers for status-related reasons, such as "staying on top of the community," making voting decisions, and understanding community events. Similarly, Griffin (1990) found that more educated respondents were more likely to pay attention to print media public affairs content and that the relationship between newspaper use and knowledge was significant for the

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more educated but not for the less educated. Kleinnijenhuis's (1991) study in the Netherlands also indicates that newspaper exposure is more advantageous to those with more formal education.

This suggests that gaps in knowledge are likely as the result of differences in media attention, processing, and dependency relations between the lower- and higher-SES groups (Gunter, 1987; Robinson & Levy, 1986). SES will likely remain a dominant factor in knowledge gaps unless some major structural adjustments improve media access for the less educated (Donohue et al., 1987). Some have argued that new technologies such as cable television, videotext, and computers could alleviate gaps (Compaine, 1986; Parker & Dunn, 1972), but this is questionable, because higher-SES groups are more likely to adopt and to benefit from such innovations (Berg, 1984; Ettema, 1984; Finnegan, Viswanath, & Loken, 1988; Rogers, 1976; Scherer, 1989; Tomita, 1989).

### THE KNOWLEDGE GAP AS A MULTILEVEL PHENOMENON

Mass communication research, like many other social and behavioral sciences, has experienced a continuing debate about the levels at which phenomena should be measured (Berger & Chaffee, 1987; Huber, 1991; Paisley, 1984; Pan & McLeod, 1991). This is certainly true of the knowledge gap hypothesis. The original hypothesis was proposed as a social structural phenomenon (Donohue et al., 1975; Olien et al., 1983; Tichenor et al., 1970; Tichenor, Donohue, & Olien, 1973; Tichenor, Rodenkirchen, Olien, & Donohue, 1973), though some of the reasons given for gaps were social psychological. As research expanded, however, individual-level explanations such as motivation and information functionality have been offered (Ettema & Kline, 1977; Gaziano & Gaziano, 1994; Tichenor et al., 1970). The measurement of gaps at both levels sometimes leads to a lack of explanatory clarity, but the debate over which level is better is less fruitful and often less informative. The social structural and individual-difference approaches examine the gap phenomenon at distinctly different levels of reality. The emphasis ought to be on finding distinctive links between the two levels (Alexander, Giesen, Munch, & Smelser, 1987; Pan & McLeod, 1991). In this sense, the knowledge gap offers a chance for the development of such a multilevel perspective and the identification and illumination of "cross-level linkages" (Pan & McLeod, 1991).

#### Individual-Level Explanations

Ettema and his colleagues (Ettema & Kline, 1977; Ettema et al., 1983) have proposed an alternative hypothesis, suggesting that motivational and situational variables may be more important than SES:

As infusion of mass media information into a social system increases, segments of the population motivated to acquire that information and/or for which the information is functional tend to acquire the information at a faster rate than those not motivated or for which it is not functional, so that the gap in knowledge between these segments tends to increase rather than decrease. (Ettema & Kline, 1977, p. 188)

The assumption behind this argument is that the effect of SES can be overridden by individual-level factors (Clarke & Kline, 1974, Dervin, 1980; Robinson, 1972; Sears & Freedman, 1967). A number of such variables have been studied, including interest (Genova & Greenberg, 1979; Horstmann, 1991; Neuman, 1976; Pan, 1990), importance and threat (Ettema et al., 1983), involvement (Salmon, 1985), concern and salience (Chew & Palmer, 1994; Ettema et al., 1983; Nazzaro, 1989; Zandpour & Fellow, 1992), cognitive schemata (i.e., "packets" of facts and beliefs; Fredin et al., 1994), and individual participation (Horstmann, 1991; Lovrich & Pierce, 1984). Each has been found to be associated with knowledge, and some more strongly than SES and its surrogate, education (see Table 5.1).

However, other studies have raised doubts about the strength of such factors of individual difference in overriding SES as a knowledge gap determinant (Gandy & El Wayly, 1985; Gaziano, 1984; Griffin, 1990; McLeod & Perse, 1994; Price & Zaller, 1993; Rucinski & Ryu, 1991; Simmons & Garda, 1982; Snyder, 1990; Viswanath, 1990; Yows et al., 1991), even gender and age (Butler, 1990). Lovrich and Pierce (1984) found that motivational variables were stronger predictors of knowledge than SES, but that education was a stronger predictor of "problem articulation" (a measure of information-processing skills) than were motivational variables. Income was also a predictor, although participation in the issue was a stronger predictor of familiarity with technical terms. Only in self-assessed knowledge were motivation variables (use and participation) significant predictors compared with SES variables. Recent research has compared knowledge between groups more and less motivated and found education-based gaps in both groups, although the size of the gap was smaller in the motivated group (Viswanath, Kahn, Finnegan, Hertog, & Potter, 1993).

Several generalizations emerge from this work. First, a number of individual motivational factors are surely related to knowledge and may occasionally mitigate the impact of SES and its surrogate, education. Second, it is conceivable that motivational factors themselves could gain strength as a result of gains in knowledge. This suggests that the causal link between knowledge and motivation is not so clear in the research that directionality may be assumed. It may require reassessment (Horstmann, 1991). A third issue has to do with who is more motivated to acquire information and why they are motivated. Some studies have noted that motivation to acquire information is itself associated with greater education (Viswanath, Kahn, et al., 1993), although there have also been contrary findings (Chew & Palmer, 1994).<sup>6</sup> In any case, the suggestion is that motivation

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to acquire information may itself have an underlying social structural cause. For example, community leaders and people deeply involved in their communities may be motivated to acquire information on a broad variety of subjects that have little individual concern or immediate personal interest attached (Price & Zaller, 1993; Viswanath, 1988). Keeping up with national and international news may be perceived by these individuals as critical for their performance of their elite roles. The diversity of interests held by those with more formal education and their ability to capitalize on their prior knowledge are well documented (McLeod & Perse, 1994; Price & Zaller, 1993). That is, a structural factor such as SES (education) could account for greater attention, interest, motivation, and knowledge (Fredin et al., 1994).

### Structural Explanations

The knowledge gap hypothesis was originally formulated in the context of the sociology of development and has therefore focused on the important role of the social environments of communities in mediating communication effects. Thus, factors playing a crucial role in knowledge gaps include social conflict, community social structure, and information control, such as mobilization functions exercised by campaign planners, policy makers, and other advocates and actors.

### *Community Structure and Environment*

Complex and pluralistic community environments affect knowledge gaps through their structural diversity, specialized expertise, and multiple sources of power (Aiken & Mott, 1970; Tichenor et al., 1980; Vidich & Bensman, 1958; Vidich, Bensman, & Stein, 1964; Warren, 1973, 1978; Williams, Herman, Liebman, & Dye, 1965). Because of these factors, decisions affecting the community are necessarily discussed more broadly in the public arena, of which the news media constitute a key gatekeeper. In pluralistic communities there is competition among groups and other actors for power and influence, and thus the likelihood of overt conflict is greater than in more homogeneous communities (Coleman, 1957).

In such a heterogeneous system, members rely on the mass media and other secondary communication channels to keep track of various groups' actions and other relevant information. Mass media may be further supplemented by other formal and informal information sources. Exposure patterns are selective and may vary by interests. Because of the relatively specialized environment, much information about specific issues may appeal only narrowly to those segments with well-defined interests who have access to it and who already may have some information about it.

In relatively small, homogeneous communities, the primary mode of communication is interpersonal. Single individuals may fulfill multiple power and leadership roles. One leader in such a setting may be simultaneously a

member of the city council, an officer of a local club, and a member of the planning board. Power is therefore relatively narrowly distributed, and decisions are likely to be made by fewer individuals than in heterogeneous communities, and often with less public scrutiny (Vidich & Bensman, 1958). News media (especially newspapers) may be accountable to the local power base, which often includes the local editor or publisher (Edelstein & Schulz, 1963). News media are more likely to avoid reporting conflict than they would be in larger communities, and therefore are more likely to reflect the consensus style of small towns (Tichenor et al., 1980). Because of the informal nature of the information environment and interpersonal interaction, it is possible that some kinds of information may flow faster and perhaps more equally to all social groups than in other environments.

A majority of studies using this perspective have found that knowledge gaps were greater in large, heterogeneous communities compared with smaller, homogeneous communities (see discussion by Gaziano, 1988; Tichenor et al., 1980) (Table 5.1). Gandy and El Wayly (1985), for instance, found education-based knowledge gaps based in a study of a foreign affairs issue in Washington, D.C. As a corollary to these findings, gaps were not found as a result of a heart disease prevention campaign in a small, homogeneous community (Ettema et al., 1983). Other campaign studies in homogeneous communities in India have reported no gaps or narrowing gaps (Galloway, 1977; Shinghi & Mody, 1976), and, in the case of a study in the United States, even reverse gaps have been found, in which less educated groups learned more than their more educated counterparts (Douglas et al., 1970).

Nevertheless, some recent studies have identified conditions under which this proposition may not hold. Expected SES-based gaps in heart disease prevention knowledge did not appear in more complex compared to less complex communities. There has also been the suggestion that temporarily appearing SES-based gaps may have closed more rapidly in pluralistic communities, in contrast to the findings reviewed above (Viswanath et al., 1994; Viswanath, Finnegan, & Kahn, 1993). And in a study of one community, the magnitude of expected SES-based gaps actually decreased over 16 years as the community became more pluralistic (Melwani et al., 1994).

There are several possible ways to account for these rare but contrasting findings about pluralism and its effects on knowledge. First, specialization may actually work to the advantage of information flow on certain topics. That is, urban communities are likely to have more diverse channels, and specialized information on such topics as science and health may be more readily available. In fact, Finnegan et al. (1993) studied exposure to sources of information on heart disease prevention in different community types and concluded that respondents in the most complex community reported exposure to a greater number as well as a greater variety of sources, compared with less complex communities (though this exposure difference narrowed over 10 years). Pearson (1990, 1993) in a study comparing rural and urban

Alaskan media environments, found larger gaps in rural areas. This suggests the limiting effect of media-poor environments on "information redundancy," that is, the repetition of the same information in multiple media channels. McDivitt (1985) and Hornik (1989) also found that knowledge gaps narrowed in a prodevelopment community in Gambia, Africa.

Second, an analysis of metropolitan daily newspaper circulation "pullback" in Minnesota by Donohue et al. (1986) showed decreasing penetration of metro dailies in nonmetropolitan areas, increasing association between education and metro daily reading in regional cities, and an association between metro daily reading and education in rural areas. These changes, the authors warn, may potentially increase knowledge gaps between metropolitan communities and regional and outlying areas, because metro daily news coverage is more comprehensive. In further analyses, Tichenor, Olien, and Donohue (1987) confirmed that metro daily newspaper use in small towns is also related to education, suggesting further potential of widening knowledge gaps. Among readers of a metro paper, however, the usual association between knowledge and education disappeared (Horstmann, 1991). These three studies suggest important limitations on the capacity of rural communities to compensate for a lack of channels, including specialized ones prevalent in urban areas (Donohue et al., 1986; Pearson, 1990; Tichenor et al., 1987).

Third, the potential for conflict is greater in heterogeneous communities compared with homogeneous communities (as discussed further below) (Donohue, Olien, & Tichenor, 1985).

The foregoing discussion raises some important theoretical and policy issues about the knowledge gap hypothesis. It appears that when information is of a specialized nature, pluralistic communities may have an advantage due to the information-rich diverse environment. Under such conditions, knowledge gaps may be more likely in less pluralistic communities (Abrahamsson, 1982). If information is of a more general, less specialized nature, smaller, homogeneous communities may have the advantage and experience fewer knowledge gaps due to structural considerations. The problem, however, is an increasing sense among researchers and policy makers that full participation in public decision making involves access to specialized information sources, thus, rural communities are at a decided disadvantage. It is these differences in access to information channels between rural and urban areas and their consequences that warrant further study.

### *Social Conflict and Mobilization*

Conflict is a crucial process influencing social change. As Coser (1956, 1967) has argued, conflict may be both functional and dysfunctional in a social system. Conflict within a social system may increase concern and salience and thus increase media coverage on specific conflictual issues. Donohue et al. (1975) argue that community tensions "stimulate communicative

activity," including the flow of information via interpersonal channels. As discussed earlier, research has suggested an inverse relationship between the level of community conflict over an issue and SES-based knowledge gaps. Because overt conflict is more likely in more pluralistic communities, the potential for narrowing gaps may be higher in such communities. The association between decreased knowledge gaps and conflict has been supported in some studies in the United States and India (Donohue et al., 1975; Frazier, 1986; Galloway, 1977; Genova & Greenberg, 1979), although Frazier (1986) also reports gaps in inaccurate knowledge. However, in at least one study education-based knowledge differentials were evident despite increased social conflict (Lovrich & Pierce, 1984).

Social conflict, however, is often accompanied by and sometimes propelled by community groups, organizations, and institutions that seek to mobilize their members and the general public to affect public issues. This activity may take the form of efforts to redress a perceived injustice or to take purposive action to ameliorate a social problem. Such activity also has the potential to equalize knowledge across population subgroups (Viswanath, 1990).

Mobilized community groups may help further propel information diffusion to population subgroups, because they are dependable and early sources of information and provide opportunities for informal discussion. Such a tendency toward equalization has been confirmed in some studies in the United States and abroad (Brantgarde, 1983; Galloway, 1977; Gaziano, 1984).

Like social conflict, mobilization may also be dysfunctional to communities. Organizations may stratify their activities between more and less influential members and constituencies. Because less educated groups are less likely to be active, organizations may contribute to knowledge inequities between active and less active members (Galloway, 1977; Gaziano, 1984; Lovrich & Pierce, 1984). Gaziano (1984) found, for example, that even on issues involving high levels of visible organizational action, better-educated readers of a neighborhood newspaper learned more about the issues than did readers with less education.

### *Information Control*

Lazarsfeld and Merton (1948/1960) identify three conditions under which mass media may be effective in influencing social change: monopolization, canalization, and supplementation. *Monopolization* is the extent to which one can control information about a topic or issue in a communication channel with a dominant message. *Canalization* refers to the use of mass media to promote and direct preexisting attitudes and behavior patterns. *Source supplementation* refers to interpersonal interaction as an addition to mass media exposure.

Research suggests that effective social change campaigns have succeeded in narrowing or eliminating knowledge gaps because they have been able to achieve some level of monopolization and supplementation (e.g., following

media campaigns with face-to-face interaction and community mobilization). However, an important question is whether guided social change through research and demonstration projects may achieve such results in highly pluralistic communities in which resources may be insufficient to achieve the level of control necessary. The evidence here is thin but suggests a positive direction. For example, demonstration projects such as the "green revolution" in developing countries have had qualified success. This has likely been due to interventions mounted at multiple social levels over a sustained period and with consensus that a particular issue is a national priority. This may provide a plausible explanation why some directed social change programs in developing and developed countries have not experienced SES-based knowledge differences (Ettema et al., 1983; Galloway, 1977; Olien et al., 1983; Shinghi et al., 1982; Shinghi & Mody, 1976).

In summary, the degree of control over information exercised by communicators over the message environment appears to be an important variable affecting knowledge gaps.<sup>7</sup>

### Levels of Analysis: A Summary

The foregoing review of individual- and structural-level explanations for the knowledge gap suggests that variables at each level interact to affect knowledge outcomes. Less is understood about their precise relationship, however. The knowledge gap hypothesis offers a fruitful avenue for linking these levels of analysis (Pan & McLeod, 1991). The problem is to identify relationships that link levels of analysis—the so-called situational and trans-situational variables. Studies drawing these links do succeed in improving our understanding of the role of individual-level variables under varying structural conditions (Gaziano, 1984; Viswanath et al., 1991; Viswanath, Kahn, et al., 1993). Such studies can also identify and explicate the mediating factors between structure and knowledge (Fredin et al., 1994).<sup>8</sup>

The implications of these different levels of explanation applied to social change are profound. The unintended consequence of explaining gaps due to a lack of motivation shifts the focus from social structure to individuals, perhaps unintentionally engaging in "victim blaming." This kind of interpretation is unlikely to encourage powerful community groups to consider systemic adjustments to reduce inequities. Nevertheless, the debate over individual difference and social structure as the source of knowledge gaps has been productive in advancing development of the hypothesis.

## CONCEPTUAL AND METHODOLOGICAL CONSIDERATIONS

The conceptual meaning of the knowledge gap has varied somewhat in the literature. As originally conceptualized, the knowledge gap was the difference

in knowledge between members of higher and lower SES, with education often used as an SES indicator. Many studies and textbooks have used the term in this sense but have been careful to elaborate on the empirical evidence (Severin & Tankard, 1992; Tan, 1985). Other terms have also been used: "information gaps" (Brantgarde, 1983; Compaine, 1986; Nowak, 1977), "communication gaps" (Dervin, 1980), information or communication "inequities" (Dervin, 1980, 1989), "information redistribution" (McNelly, 1973), "information differentials" (Tan, 1985), and "information holding" (Clarke & Kline, 1974). Rogers (1976, 1983) has proposed the terms "communication effects gap" and "socioeconomic benefits gap" to indicate whether innovations have increased gaps in socioeconomic status and/or knowledge of information (Galloway, 1977; Shinghi & Mody, 1976).

One group of researchers has sought to widen the concept to include political participation—"equivalence in informed political participation," with knowledge equivalence as one part of participation (McLeod, Bybee, & Durall, 1981). Others have studied "influence gaps" as the ability of higher-SES groups to influence decision making (Brantgarde, 1983; Severin & Tankard, 1992). Although knowledge gap research has conventionally emphasized SES differences as the distinguishing effect, some critiques have sought to distinguish "education-based" from "interest-based" gaps, that is, gaps due to differences in education and gaps due to differences in motivation or interest (Chew & Palmer, 1994; Ettema et al., 1983; Viswanath, Kahn, et al., 1993). Others have used sociodemographic rather than SES comparisons per se. These have included differences between the young and the old (McLeod et al., 1981), men compared with women (Finnegan et al., 1988), and those more and less involved in their communities (Viswanath, Kosicki, et al., 1993).

We next turn to some important methodology issues, including ceiling effects, operational measures, and study design.

### Ceiling Effects

Ettema and Kline (1977) have offered ceiling effects as a possible explanation for narrowing knowledge gaps among SES groups. The idea of a ceiling effect is that knowledge diffuses rapidly among higher-SES groups but completes its diffusion at an asymptote signifying that most members of the group know the information—little further diffusion can therefore take place. Because lower-SES groups experience slower information diffusion, they will be in a position of perpetually "catching up" to higher-SES groups, where diffusion has plateaued. The ceiling effect thus may lead to a conclusion that knowledge gaps narrow over time between groups. This has often been shown to be the case with less complex information (Galloway, 1977; Greenberg, 1964; Spitzer & Denzin, 1965; Viswanath et al., 1994), but other studies have shown that gaps remain on more complex knowledge measures (Moore, 1987).

Ceiling effects, however, raise some important conceptual issues. The assumption here is that once higher-SES groups learn a particular bit of information, they do not continue to learn it, and lower-SES groups eventually "catch up." This idea of catching up has a corollary version widely shared in the literature: the "trickle-down effect." That is, information, like innovations, technology, and wealth, is often expected to trickle down to lower-SES groups (Compaine, 1986).<sup>9</sup>

This assumption that knowledge on specific issues will remain stationary among higher-SES groups while lower-SES groups catch up is questionable for three reasons. First, there is evidence that although simple familiarity may increase over time with publicity, gaps in complex information may endure (Moore, 1987; Viswanath et al., 1994). For example, although knowledge about the link between smoking and lung disease is widespread, other ill effects of smoking are not as well known (Donohue et al., 1990; U.S. Department of Health and Human Services, 1989). This suggests that ceiling effects may be a measurement artifact of the kind of knowledge studied.

Second, knowledge and information are seldom stationary. New information born of science, politics, health, and other fields is discovered and reported every day. Learning new information—particularly specialized information—often requires some prior knowledge base from which to interpret and convert it to some use. Higher-SES group members are more likely to possess prior knowledge in a variety of areas and are therefore more likely to acquire new information than are lower-SES group members (Price & Zaller, 1993; Scherer, 1989). This has serious determinist implications, as proposed recently by Donohue et al. (1990). That is, gaps may close in certain knowledge domains, but they will continue and even expand in other domains. As Tichenor et al. (1970) argue, media have limited resources, suggesting the possibility that although some information is widely distributed, most other information may not be, and gaps may continue.

Third, as Price and Zaller (1993) report, those who know more will continue to know more. Prior knowledge in many cases is the strongest predictor of subsequent knowledge. Ceiling effects, however, merit further study; perhaps they can be best approached through longitudinal research designs.

### Operational Measures of Knowledge

Clarke and Kline (1974) assert that operationalizing knowledge through structured, closed-ended items may disadvantage lower-SES respondents. They argue that such measures reflect researchers' biases about what information people ought to know, irrespective of the information's relevance or utility to respondents. They propose that a "respondent-centered and open-ended" measure would tap information holding by including the dimension of salience or value to respondents. An open-ended measure, Clarke and Kline

argue, should give respondents a chance to articulate knowledge in their own terms and to elaborate on topics of personal concern.<sup>10</sup>

However, use of open-ended knowledge measures has not demonstrated that SES-based gaps disappear (Benton & Frazier, 1976; Clarke & Kline, 1974; Donohue et al., 1975; Edelstein, 1973; Finnegan et al., 1990; Gandy & El Waylly, 1985; Gaziano, 1984; Lovrich & Pierce, 1984; Viswanath, 1990), although gaps have been reported to be lower in magnitude (Gaziano, 1983). Other studies in the United States and India that have used closed-ended measures have found significant associations between knowledge and education or knowledge and interest (Chew & Palmer, 1994; Ettema et al., 1983; Galloway, 1977; Genova & Greenberg, 1979). Thus, the operationalizing of knowledge through open or closed approaches does not seem to affect gaps as much as other variables, but it is possible that their magnitude is somewhat reduced (see Table 5.1).

Two studies evaluating the open-ended approach are germane here. Finnegan, Viswanath, Hannan, Weisbrod, and Jacobs (1989) found that message discrimination (an open-ended measure of information holding) did not necessarily work to the advantage of less educated respondents. Their data showed that younger respondents with more formal education were likely to discriminate more messages than were less educated, older respondents. McLeod, Pan, Rucinski, and Kosicki (1988) found knowledge differentials in both open-ended and closed-ended measures. They also reported that open and closed items did not necessarily measure the same dimensions of knowledge, suggesting one cannot substitute for the other.

### Study Design as a Factor

The knowledge gap hypothesis would seem to require longitudinal study designs, but substantial evidence for the hypothesis has been developed from cross-sectional studies (Donohue et al., 1975; Finnegan et al., 1988, 1990; Gandy & El Waylly, 1985; Tichenor et al., 1980). Reviews by Gaziano (1983) as well as our own work indicate mixed findings in both types of designs. Some longitudinal studies in both developing and developed countries have shown declining gaps (Bailey, 1971; Chew & Palmer, 1994; Donohue et al., 1975; Douglas et al., 1970; Ettema et al., 1983; Galloway, 1977; Gaziano, 1983, 1984; Genova & Greenberg, 1979; Griffin, 1990; Miyo, 1983; Viswanath, Finnegan, & Kahn, 1993), whereas others have shown no change (Abbott, 1978; Bogart, 1957-1958; Horstmann, 1991; Shinghi & Mody, 1976; Star & Hughes, 1950) or increasing gaps (Cook et al., 1975; Moore, 1987; Pan, 1990; Price & Zaller, 1993; Snyder, 1990; Viswanath, Finnegan, & Kahn, 1993).

Longitudinal studies suggest considerable promise for helping us to understand the role of contingent conditions affecting gaps. More such studies will provide useful information on long-term trends as well as changes in knowledge over time as a result of changes in community conditions.

## THE FUTURE OF KNOWLEDGE GAP RESEARCH: TENTATIVE DIRECTIONS

In light of the values underlying knowledge gap research and its extensive development as a research program, what is our current understanding of the hypothesis? Optimistic scenarios lead to the conclusion that knowledge gaps are not inevitable or intractable, but may be bridged with careful planning and structural adjustments. On the other hand, the potential for gaps is an ever-present danger in future guided social change efforts and in efforts to influence social problems using media publicity. There are at least three areas that could prove fruitful for future research: the role of community structure, the role of interpersonal communication, and media dependency and orientations.

### The Role of Community Structure

Although early studies led to the conclusion that knowledge gaps are most likely to be found in relatively pluralistic systems, recent evidence suggests that this proposition may be wrong. Phenomena that deserve further study in this connection include the continued development in cities of diverse media channels; the reduction of information and channel availability in rural areas, and the consequent marginalization of rural residents as participants in the flow of information; the increasing complexity of information surrounding public policy and decision making, and how rural communities compensate in light of their having less access to information; and finally, how these changes may affect community conflict.

### The Role of Interpersonal Communication

Despite calls for research into the role of interpersonal communication, few studies have examined its role explicitly in studying knowledge gaps. The literature suggests at least two avenues of research. First, what role does interpersonal communication between similar and dissimilar groups play in knowledge gaps? Second, does the role of interpersonal communication vary by community structure? Answers to both questions could also help to build linkages between structural- and individual-level explanations for the knowledge gap.

### Media Dependency, Orientations, and Knowledge Gaps

Many studies have examined the roles that different media play in knowledge gaps. Some have argued that gaps are likely because of the middle- and upper-class orientation of print media. Others have suggested that television could be a knowledge leveler. Studies suggest that audiences' reasons for media use vary, and that these have a differential impact on knowledge acquisition. More research on variable media attention, processing, and

dependency relationships could add considerably to our understanding of the knowledge gap. In fact, studies in this area could provide fruitful connections with studies in the uses and gratifications and media dependency traditions.

### IDEOLOGICAL CONSIDERATIONS: WHAT DO GAPS MEAN?

As we suggested at the outset of this chapter, the knowledge gap hypothesis arises out of a particular understanding of the role of information and control in social systems (Donohue, Tichenor, & Olien, 1973). As such, knowledge gap research is driven by values and insights related to power and its growth and distribution in society. For example, in a seminal 1949 article, Moore and Tumin identified the consequences of ignorance (the "counterpoint of knowledge") for different SES groups. They examined the consequences of the increasing division of labor and suggested that differential access to knowledge tends to perpetuate the power of the privileged few. Ignorance among lower-SES groups tends to hide preferential treatment and to mask unjust reward structures in a social system. This is particularly relevant to public policy making, in which higher-SES groups often take advantage of their superior access to knowledge. Moore and Tumin also suggest that a class system is open only to the extent that the capacity to move up the social ladder is based on equal access to knowledge. SES-based knowledge differentials constrain the social mobility of lower-SES groups. The idea that knowledge is an essential element of citizens' full participation in a republican democracy and mobility into higher social classes has long been a concern of U.S. society (Watkinson, 1990), and knowledge gap research continues this tradition.

We next turn to a discussion of the evolution of the hypothesis and how it relates to other hypotheses in media studies.

#### Ideological Critique of the Knowledge Gap

Some scholars have raised paradigmatic and ideological considerations about knowledge gap research (e.g., Dervin, 1980; Friemuth, 1989). Dervin (1980), for example, has used the knowledge gap to critique logical positivism and the "source-receiver" communication model. She reaches the following conclusions:

- Knowledge gap research, like other "traditional" models of communication, adopts the source-receiver model, where a source is "seen" to be sending a message to the audience and then evaluating whether the audience received the message or not.
- The idea of the knowledge gap was introduced as an explanation of "why limited effects were available" at a time when researchers were disenchanted with the concepts of the "obstinate audience" and "limited media effects."

- One of the challenges to the knowledge gap hypothesis comes from the literature that points to the social system as the problem, rather than the individual.
- The knowledge gap approach, along with diffusion of innovations research, "blames the victims"—that is, the audience—for a lack of media-generated outcomes, especially through campaigns.

The bases of Dervin's criticisms are in part ideological and in part theoretical. First, although there are some commonalities, there are also crucial differences among the assumptions of the limited effects and diffusion of innovations models and knowledge gap research. Second, the differences in implications derived from these different assumptions are masked and unfairly group the knowledge gap approach with diffusion of innovations research in Dervin's critique. Third, her view that proponents of the knowledge gap "hang on" to the hypothesis in the face of contradictory evidence is certainly arguable if one looks at the knowledge gap as a coherent scientific research program from a philosophy of science point of view (Lakatos, 1968).

It is important to put knowledge gap research in perspective while addressing this critique. We will do this by looking at the intellectual roots of the knowledge gap and of the so-called traditional model of communication, and by addressing whether the knowledge gap is really a "scientific research program" (Lakatos, 1968, 1970).

## THE KNOWLEDGE GAP AND LIMITED EFFECTS

Dervin's critique of the knowledge gap places the hypothesis in the same category as the "limited effects" model of mass communication research. We argue that the differences between these approaches outweigh their similarities. Much of the limited effects model evolved from two sets of studies: political communication research by the Columbia group, including Lazarsfeld and his colleagues (Katz & Lazarsfeld, 1955; Lazarsfeld, Berelson, & Gaudet, 1944; Lazarsfeld & Stanton, 1941, 1944, 1949), and attitude change studies by the Yale group represented in the work of Hovland and his colleagues (Hovland, 1954; Hovland, Janis, & Kelley, 1953; Hovland & Rosenberg, 1960; Sherif & Hovland, 1960). Neither group, nor researchers such as Klapper (1960), suggested that media have limited effects; rather, they argued that media effects are "limited" by certain contingent conditions.<sup>11</sup> This is a careful assessment by careful researchers. However, for a variety of reasons this careful interpretation has often been overinterpreted by researchers and policy makers who assumed that these early communication researchers were urging that the mass media be viewed as of negligible power and influence. Recent reevaluations of their work have raised four points. First, media effects were actually larger in their studies than stated in their published work (Becker, McCombs, & McLeod, 1975; Chaffee & Hoheimer, 1985; Delia, 1987; Gitlin, 1978). Second, media effects may be

even more pronounced if research were to emphasize cognitive rather than affective changes resulting from media exposure (Becker et al., 1975; Clarke & Kline, 1974; Noelle-Neumann, 1993; Roberts & Bachen, 1985). Third, media effects are not uniform, but vary for different population subgroups (Tichenor et al., 1970). Fourth, new media technologies have emerged since the completion of this early work.<sup>12</sup>

Unlike the limited effects model, knowledge gap studies have dealt with the impact of mass media on cognitive rather than affective variables. Additionally, unlike the Columbia studies, knowledge gap research has hypothesized differential impacts on population subgroups.

Another major difference is that the limited effects model implied a trickle-down impact of mass media through which there could be eventual equalization of benefits. Knowledge gap research, however, posits the potential of enduring gaps between information "haves" and "have-nots."

Similarly, the intellectual assumptions of knowledge gap research, although sharing some commonalities, also differ from the assumptions of diffusion of innovations research. The latter is largely informed by the "modernization" paradigm, in which communication has been viewed as the "magic multiplier" of modern qualities among "traditionals." Modernization scholars have assumed that if the people of a nation develop certain psychological attributes, such as "empathy" or "psychological mobility," there could be an aggregate movement toward development. As Portes (1976) and Lee (1980) have pointed out, this research is flawed in the sense that it has applied a uniquely European experience to nation making, development, and social change in the developing world. It has also been criticized for using the social psychological variables of empathy, need achievement, fatalism, and modernity, among others, to explain macrosocial transformations. Both have their roots in the classical functionalism of Parsons and others.

In contrast, knowledge gap research draws its intellectual inspiration from functional conflict theories that raise the issue of resource and power inequities in social systems (Coser, 1956, 1967; Dahrendorf, 1959). This brings us to Dervin's (1980) point about "blaming the victim."<sup>13</sup> Dervin argues that the knowledge gap approach passes moral judgment on individuals for not knowing about a topic. We argue that because of the concern with resource and power inequities, the knowledge gap actually focuses on social structure and its constraints rather than on individuals. In fact, this was one of the first approaches in mass communication research to draw attention to structural and institutional factors regarding mass media effects. For many scholars from the developing world, the knowledge gap approach has offered a useful framework for addressing the weaknesses of the diffusion research paradigm by providing an explanatory framework for campaign effects.

Dervin's final point—that knowledge gap researchers "hang on" to the hypothesis despite contradictory evidence—can be addressed only from a

## IS THE KNOWLEDGE GAP HYPOTHESIS A PROGRAM OF RESEARCH?

Sir Karl Popper, in his work *The Logic of Scientific Discovery* (1968) and his other writings (e.g., Popper, 1970), argues that scientific enterprise is essentially "critical," consisting of "bold conjectures, controlled by criticism," where the theory is logically deduced. To Popper, scientific enterprise is the systematic testing of theories and statements to solve problems. Experiments and observation attempt to validate prior theories and hypotheses. The failure to validate is the failure of the theory itself. Therefore, for Popper, a theory is acceptable only when it can specify in advance the conditions under which it could be falsified.

In a debate with Popper, Kuhn (1970) has argued that Popper's description of scientific enterprise as a systematic testing of theories is not an accurate description of most scientific enterprise. In fact, according to Kuhn, it applies only to "extraordinary science"—it usually occurs in moments of crisis. In contrast, Kuhn focuses on the psychology of science and on individual scientists, rather than on science itself.<sup>14</sup>

Kuhn (1970) argues that scientists are interested in solving puzzles. For Kuhn, falsification is not enough, nor should it be the criterion for scientific progress. He asserts that it is not always possible to identify in advance all the conditions under which a theory could be rejected. Kuhn argues that science can move forward only on the basis of knowledge existing at the moment. As Tichenor and McLeod (1989) suggest, investigators seek partial explanations and provide only partial knowledge. According to Kuhn, scientists accept a new theory only when it solves all numerical puzzles that have been treated by the predecessor theory, and this occurs only during periods of "extraordinary science." Kuhn's point is that scientists work under one dominant set of assumptions, "a paradigm." Popper posits that Kuhn's description of scientific progress from normal science under one dominant framework interrupted by periods of revolution may not fit all types of science. Both Popper (1970) and Watkins (1970) take exception to Kuhn's suggestion and argue that any given time there can be more than one dominant theoretical framework. Popper's (1970) preferred term is "research program"—"a mode of explanation which is considered so satisfactory by some scientists that they demand its general acceptance" (p. 55).

In comparison with Popper and Kuhn, Lakatos (1970) has proposed an even bolder approach to understanding the scientific enterprise. Lakatos agrees with Popper that "descriptive units of science are not isolated hypotheses but a coherent program of research."<sup>15</sup> Such a program is characterized by a solid theoretical core with a "vast protective belt of auxiliary hypotheses," unexplained anomalies, and unsolved problems. Differing from Popper, Lakatos offers a "sophisticated methodological falsificationist" approach outlining a set of rules of acceptance and demarcation of science from pseudoscience and progressive science from degenerative science.

Lakatos (1970) suggests that a sophisticated falsificationist view would look at a series of theories (a research program) and not at one hypothesis. Such a series can be falsified only when a new theory can "corroborate excess empirical content over the previous theories." This occurs in the form of discovery of novel facts that the "rival" theory could not predict or might even "forbid" prediction. The newer theory should also be able to explain all of the success of the older theory, as well as whatever the older theory could not explain.

In this view, science is not a series of "refutations and conjectures," which is more suited to Kuhn's description of paradigmatic crisis, but is a program of research leading to the discovery of new facts, explanations of anomalies, and improvements on previous theory. Only when we have a better one can the original theory be "falsified." Lakatos terms this a "progressive problem-shift." For a sophisticated falsificationist, then, a proliferation of theories is vital and essential. A sophisticated falsificationist is also a theoretical pluralist.

The evolution of knowledge gap research can be evaluated in such sophisticated falsificationist terms. The original hypothesis (Tichenor et al., 1970) was an improvement over previous explanations and comes close to meeting the Lakatosian criteria in these aspects:

- It explains the lack of "success" of information campaigns in social systems. Previous theorists argued that certain population segments were unreachable through any public communication efforts. In contrast, knowledge gap research explains that a lack of success in information campaigns occurs as the result of structural limitations rather than individual faults, and that such campaigns often have the unintended consequence of widening gaps between SES groups.
- The knowledge gap hypothesis predicts the impact of information flow on knowledge equalization. Based on its structural understanding, it predicts in advance the consequences of information flow into social systems: Effects are differential, with some segments gaining more than others.
- Over time, as a result of continuing research and inconsistent results, the knowledge gap hypothesis has been refined and has identified the conditions under which gaps may or may not occur. That is, the hypothesis meets the Popperian and Lakatosian criteria that require the conditions under which the hypothesis could be falsified. However, according to the sophisticated falsificationist approach, offering refinements and alternative hypotheses does not necessarily refute the original knowledge gap hypothesis (if we accept the Lakatosian criteria instead of "naïve" falsificationism), but evolves into a series of hypotheses identifying conditions and limitations of the original.

Thus, in Lakatosian terms, this continuity "welds" knowledge gap work into a "methodology of research programs" instead of "pseudoscientific" explanations. The hallmark of any such program, then, is a contribution to the understanding and explanation of society, which ought to be the basis of any social action.

## NOTES

1. These numbers include only those studies, critiques, and dissertations in which the explicit focus is the knowledge gap hypothesis or knowledge gap and other communication hypotheses. The numbers would be much higher if we were to include all the studies that have constituted implicit tests of the knowledge gap hypothesis. It is possible that we might have missed some conference papers and some other publications, despite our best efforts to secure all of them.
2. Although the "gap" phenomenon has engaged the attention of many scholars since the 1970 publication, not all use the term *knowledge gap* or cite the original article by Tichenor et al. (1970).
3. Neuman's article was written before the advent of large cable television systems and widespread diffusion of VCRs. Both technologies may facilitate greater viewing selectivity through "channel surfing" and "time shifting."
4. Sharp (1984) presents only indirect evidence for the knowledge gap hypothesis, as her measure of knowledge is the respondent's ability to name an "important problem in the community."
5. This could also apply to different SES groups. As Childers (1975) argues, the "poor" are often locked into an "information ghetto" that cuts them off from the information flow in the larger society.
6. Chew and Palmer (1994) evaluated the impact of a television program on nutrition and compared the roles played by interest and education in affecting knowledge gaps. The difference between education-based and interest-based knowledge gaps, however, were too small to generalize and in any case measurements were difficult because viewers were invited to watch the program.
7. A clear question for future research concerns how to operationalize and measure "degree of control."
8. Fredin et al. (1994) used a somewhat different measure of knowledge: a summary of respondents' opinions on issues, approval or disapproval of local officials, and suggestions to resolve the problem under discussion. These authors argue that even though these are not strictly knowledge items, answering them required "some basis in knowledge."
9. This was accepted in some early political communication studies by the Columbia group in their formulation of the "two-step" flow hypothesis (Katz & Lazarsfeld, 1955).
10. Of course, even an open-ended knowledge measure may impose an artificial ceiling if the number of responses to be recorded is limited. Given an opportunity, more educated respondents are likely to give more responses to open-ended questions. However, researchers usually decide to record no more than a certain number (Finnegan et al., 1989).
11. This is a subtle but important difference and was their response to the widely held idea of powerful mass media. They did not say that media effects do not occur, but rather that effects were not all-encompassing, as many believed. It is also important to note that what they saw as "limited effects"—that is, "mere reinforcement"—were in fact quite powerful insofar as media supported the status quo (Gitlin, 1978).
12. TV was in its early stages of growth, and social control through media was not yet a major factor in the research perspectives of the 1940s through the 1960s when the "limited effects" model emerged. As Galbraith (1983) implies, "conditioning power," before the advent of major changes in media technologies, was perhaps more strongly exercised by other institutions: the church, family, and school.
13. This phrase was first used by Ryan (1971), who examined the social conditions of African Americans.
14. See also Watkins (1970) on this point.
15. See the version of Lakatos's Open University lecture published in 1968 and his 1970 article, which was part of the continuing debate with Popper and Kuhn and was published as part of a collection of papers from a conference on Kuhn.

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