

INTERNET AND KNOWLEDGE GAP HYPOTHESES

BY

OKAFOR, AMUCHE .C.

Department Of Mass Communication, School Of Postgraduate Studies

Nnamdi Azikiwe University, Awka

Abstract

Although the knowledge gap hypothesis is often mentioned in connection with the social consequences of the Information Society, there is little discussion of its theoretical background or specific empirical evidence. Therefore, this article explores the theoretical potential of the knowledge gap perspective for Internet research and presents data based on two recent Internet surveys, which demonstrate a double digital divide. Access to the Internet in Nigeria is still dominated by well-educated, affluent, young males and between 1997 and 2000 the gap between those who do and those who do not have access widened not narrowed. Furthermore, there are gaps in the use of the Internet too. More educated people use the Internet more actively and their use is more information oriented, whereas the less educated seem to be interested particularly in the entertainment functions of the Internet.

Key Words digital divide, Information Society, Internet use, knowledge gap, political knowledge, Switzerland

Introduction

The knowledge gap hypothesis is often mentioned in the public debate on the social consequences of the Information Society. Thereby optimistic scenarios of the future, like those, for example, of Bill Gates (1995) or Esther Dyson (1997), which is based on the assumption that the information society necessarily means an informed society for everybody, are called into question. But *pessimists* (e.g. Tapscott, 1996; Golding, 1998; Glotz, 1999; Kubicek and Welling, 2000) are worried for quite opposite reasons. They are afraid of an increasing digital divide, meaning a social gap between the information rich and the information poor – those without access to the computer and the Internet (Negroponte, 1995) – or between ‘users’ and ‘losers’ (Eichmann, 2000). It is predicted that the Internet threatens to divide society into two classes: the information elite on the one hand and those not linked to the Net on the other (Rosenthal, 1999). These concerns seem to be politically important because the underlying assumption is that information and knowledge translate into social power; inequalities in knowledge thus lead to exclusion from social resources and inequalities in social power (McLeod and Perse, 1994). Nevertheless, in the policy context (NTIA, 2000) or in media debates (O’Malley, 2000), there is hardly ever reference made either to the theoretical background of the much cited knowledge gap perspective (Bonfadelli, 1994; Viswanath and Finnegan, 1996; Gaziano and Gaziano, 1996; Kwak, 1999)

or to specific empirical evidence supporting the knowledge gap hypothesis. Not only is there a lack of solid empirical data that could demonstrate, for example, the advantages of Internet access over the use of the traditional mass media, but even from a theoretical perspective it is also rather unclear if the policy postulate of Internet access for everybody will be the necessary factor for success in the future – or if access to media or Internet information will be relevant at all.

On the contrary, it could be suggested that, above all, growing access and thereby increased availability of information will result in the creation of an information elite and new knowledge gaps due to the Internet (Rosenthal, 1999:), as was formulated by the knowledge gap hypothesis for the old mass media.

Therefore, this article has a twofold objective: the background and development of the knowledge gap perspective as well as its implications for online communication are outlined in the first, theoretical part of the article. Then the second part discusses some still controversial questions concerning differential access and use of the Internet on the basis of two new empirical Swiss surveys.

The knowledge Gap Perspective

Basic Hypothesis and Scope

In 1970, the knowledge gap hypothesis was explicitly formulated for the first time by Phillip Tichenor, George Donohue and Clarice Olien from the Minnesota University, in their article ‘Mass Media Flow and Differential Growth in Knowledge’. The basic hypothesis reads as follows: As the infusion of mass media information into a social system increases, segments of the population with higher socioeconomic status tend to acquire this information at a faster rate than the lower status segments, so that the gap in knowledge between these segments tends to increase rather than decrease. (Tichenor et al., 1970)

The hypothesis is based on more than 20 years of mass communication effects research, demonstrating implicitly the ‘apparent failure of mass publicity to inform the public at large’ (Tichenor et al., 1970), because media campaigns generally reach precisely those least in need of it, namely the already motivated and informed segments. So it runs against the widely held belief that the diffusion of information by the mass media will reach everybody and will thus result in an overall better informed public. The authors do not state that the segments of the population with lower socioeconomic status (SES) and/or low education remain completely ignorant or even that their knowledge will decrease in an absolute sense; rather the knowledge gap hypothesis posits a *relative* association insofar as the segments of the population with high SES and/ or education will access, use and acquire the information supplied by the mass media at a *faster* rate and in a *more effective* way, and this will result in a knowledge lead. But this process is not irreversible, since knowledge gaps tend to decrease if mass media information on a given topic discontinues.

Besides the time factor, there are further contingent conditions concerning media topics: the knowledge gap hypothesis above all refers to political content or public affairs as topics of media reporting. Furthermore, Tichenor et al. always refer to *single* topics and do not mention knowledge in general. Therefore, to extend the knowledge gap hypothesis to *all* information available from the traditional media or the new Internet, or the total knowledge of the recipients – whatever that might mean – is misplaced or at least premature. Then there are ceiling effects to be considered too (Ettema and Kline, 1977). Even if media information about a certain topic is increasing, and despite the possibilities of the Internet, there is in most

cases only a *quantitative* increase in the amount and the sources of information, whereas the range or diversity of arguments or the *depth* of thematic aspects, for example as a consequence of consonant media gate keeping processes, often remains limited (Schulz, 1985). In such situations, it is to be expected that media users experience a ceiling effect as well. This means that even the well informed are not able to increase their knowledge any further. And as a consequence, the least informed segments will catch up more or less automatically and knowledge levels become equal over time. A good example is agenda knowledge, i.e. 'knowledge of' an event like presidential elections. This type of knowledge cannot be increased, there is a ceiling effect – once everyone knows about the event the knowledge gaps close. Another precondition is the societal setting. The original knowledge gap hypothesis refers to western industrial societies with fully developed media systems – press and television – that reach most of the population on a daily basis. In addition, more or less stable expectations concerning the principal information functions of the traditional media have been developed. However, the Internet is still more an infrastructure not a medium in the traditional sense: it reaches only small segments of the population and there is not yet a consensus about the information or entertainment functions of the Internet.

Theoretical Background

Knowledge gaps are not seen as the result of a poorly functioning media system. The knowledge gap perspective rests instead on the assumption that the information flow is not normally homogeneous as a consequence of the underlying social structure of society. The five underlying factors or processes responsible for the emergence of knowledge gaps are as follows:

1. ***Communication skills:*** Better educated people are better able to manage communication in general and to use and interpret specific media information than less educated people (Grabe, 2000).
2. ***Prior knowledge:*** Better educated people possess more general knowledge on a broader range of public affairs topics (Price and Zaller, 1993). Therefore, the underlying cognitive frames enhance the recognition and acquisition of new information (Graber, 2001).
3. ***Relevant social contacts:*** Better educated people are integrated in broader social and/or local (Viswanath et al., 2000) networks that function as additional interpersonal information resources.
4. ***Selective use, acceptance and storage of information:*** Education correlates strongly with a general pattern concerning the civil duty of active information seeking.
5. ***Structure of the media system:*** Modern media systems are differentiated insofar as most public affairs information is distributed by the print media. These information-rich media are used much more by the better educated media users, whereas the less well educated segment of the population is dependent more on television as its main information source (McLeod and Perse, 1994).

Deficits, Differences and Contingencies

Most of the aforementioned factors are not situation specific. Thus, the basic knowledge gap hypothesis rests on the assumption that education is strongly tied to a specific pattern of media usage that can be described as active, intensive, information oriented and print dependent. Authors like Ettema and Kline (1977), Dervin (1980) or Viswanath et al. (1993), however, have pointed to other, more *situation-specific* and *motivational* factors.

Empirical research has proved that knowledge inequalities based on educational deficits can be altered or reversed – at least partly – by factors like personal relevance or interest. Yet, interest and education are not always independent but correlated, as Wirth (1997) empirically demonstrated. As education increases there is in many cases an increase in topic-specific interest too. Education and personal interest thus often work as additive and mutually reinforcing factors.

Accordingly, two rival explanatory models have been discussed (see figure 1) Traditional proponents of the knowledge gap hypothesis regarded the motivational factors as secondary; it is not a factor independent of education because the higher the education the greater the motivation. Other researchers like Genova and Greenberg (1979) or Ettema and Kline (1977) instead treated education and motivation (e.g. issue interest or degree of concern) as independent factors in the process of acquiring media information and tried to prove that not education but unequal interest and motivation are crucial for the development of knowledge gaps. Consequently, some researchers (e.g. Horstmann, 1991) regarded the knowledge gap hypothesis as unsupported or even disproved by the empirical research.

Taken together, these two rival explanations suggest a third, a contingency model (Kwak, 1999), that rests on the assumption that the emergence of education-based knowledge gaps will be moderated in many situations by motivational factors. According to Viswanath et al. (1999): ‘In our view, the issue is not motivation or education; it is motivation and education as they operate jointly to affect knowledge.’ For example, only moderate knowledge gaps are to be expected with regard to controversial topics on the macro-level of society: controversy stimulates communication and information seeking, and more people acquire more knowledge. But political interest alone without a minimum of cognitive resources, e.g. in the form of pre-existing knowledge and schemata, does not seem enough to stimulate information seeking and knowledge gain in many situations. Therefore it is the task of empirical research to study how cognitive factors like education or pre-existing knowledge as well as motivational factors like personal interest work together in specific situations.

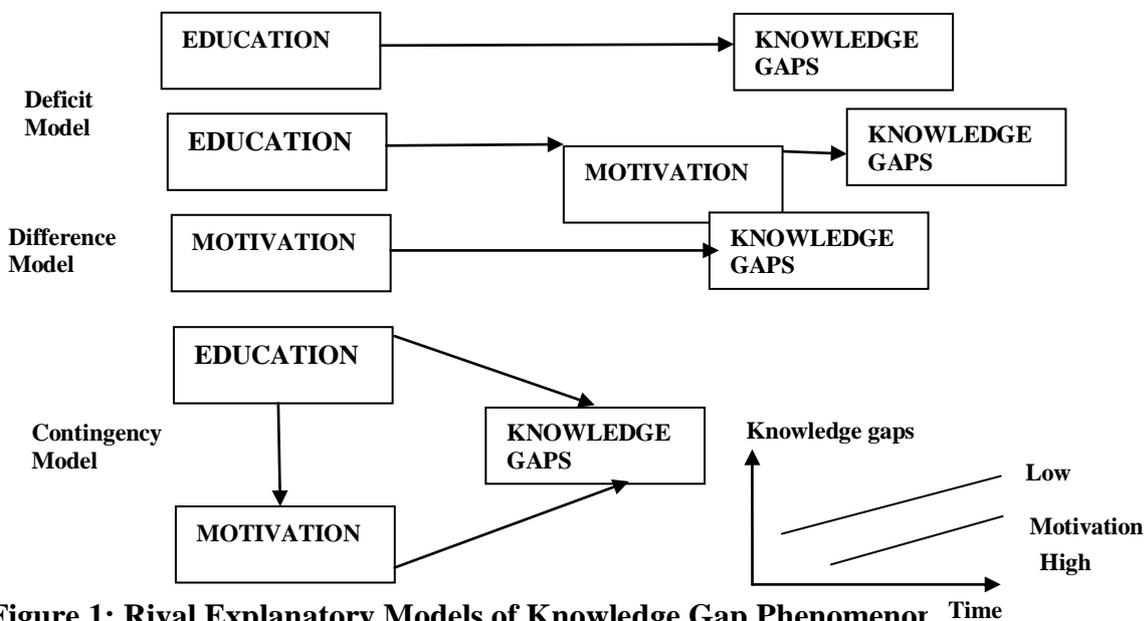


Figure 1: Rival Explanatory Models of Knowledge Gap Phenomenon

Different Types of Information and Knowledge

Advocates of the so-called difference model (Dervin, 1980) criticize how knowledge is conceptualized and measured in most of the empirical knowledge gap research. There is almost no differentiation made between different types of knowledge like topic or factual vs structural or background knowledge. In addition, many knowledge measures have been based on schoolbook-type questions with a middleclass bias. That is why there is a controversy among experts, whether the average citizen is not at all well informed or as knowledgeable as they should be (Graber 2001), or if this is largely a result of these widely used but seriously flawed factual knowledge indicators. It can be expected that knowledge gaps would be lower in empirical studies using not object-oriented but user-oriented knowledge indicators and open-ended knowledge questions and procedures that encourage respondents to think about issues from multiple perspectives instead of traditional tests of factual knowledge of the political system or public policy issues.

Different Types of Gaps in the Communication Process

A further refinement of the knowledge gap paradigm deals with the following question: at what point in the process of communication will gap phenomena occur? Surprisingly, no clear distinctions can be found in the early knowledge gap publications, either in theoretical considerations or in empirical studies, concerning

- (1) Gaps in the information supply.
- (2) Gaps in access to and use of information
- (3) Gaps in the processing of this information and finally
- (4) Gaps in the resulting knowledge.

Knowledge gaps will develop on a first level simply because different social segments belong to different media environments that enlarge or restrict the available information diet. This trend will be further strengthened by the tendency of most media to tailor their information more and more to specific target groups. Thus, relevant gaps in information supply will develop as a result of increasing topic-specific information namely in those media channels that are used predominantly by the better educated segments. Therefore there are significant supply gaps in the domain of political information, e.g. between public and commercial television channels or between quality and tabloid newspapers in most European countries. But even if media users belong to different media environments, the information supply is not totally different due to shared journalistic information values and practices. Information supply gaps will develop too as a result of the differential diffusion of new media like the Internet. Knowledge gaps can develop on a next level because of unequal use of media information even if the available information diet is the same for different social segments. Media users vary concerning their thematic interests and media information is attended to differently according to these preferences. Numerous empirical studies demonstrate correlations between content preferences specifically for political information and demographic variables like education. Gaps also occur as a result of different reception strategies. The same information used can be processed and stored differently as a result of the underlying expected media gratification – e.g. information vs entertainment– differences in the level of cognitive media attention, or unequal information-processing strategies.

Application of the knowledge Gap Perspective to the Internet

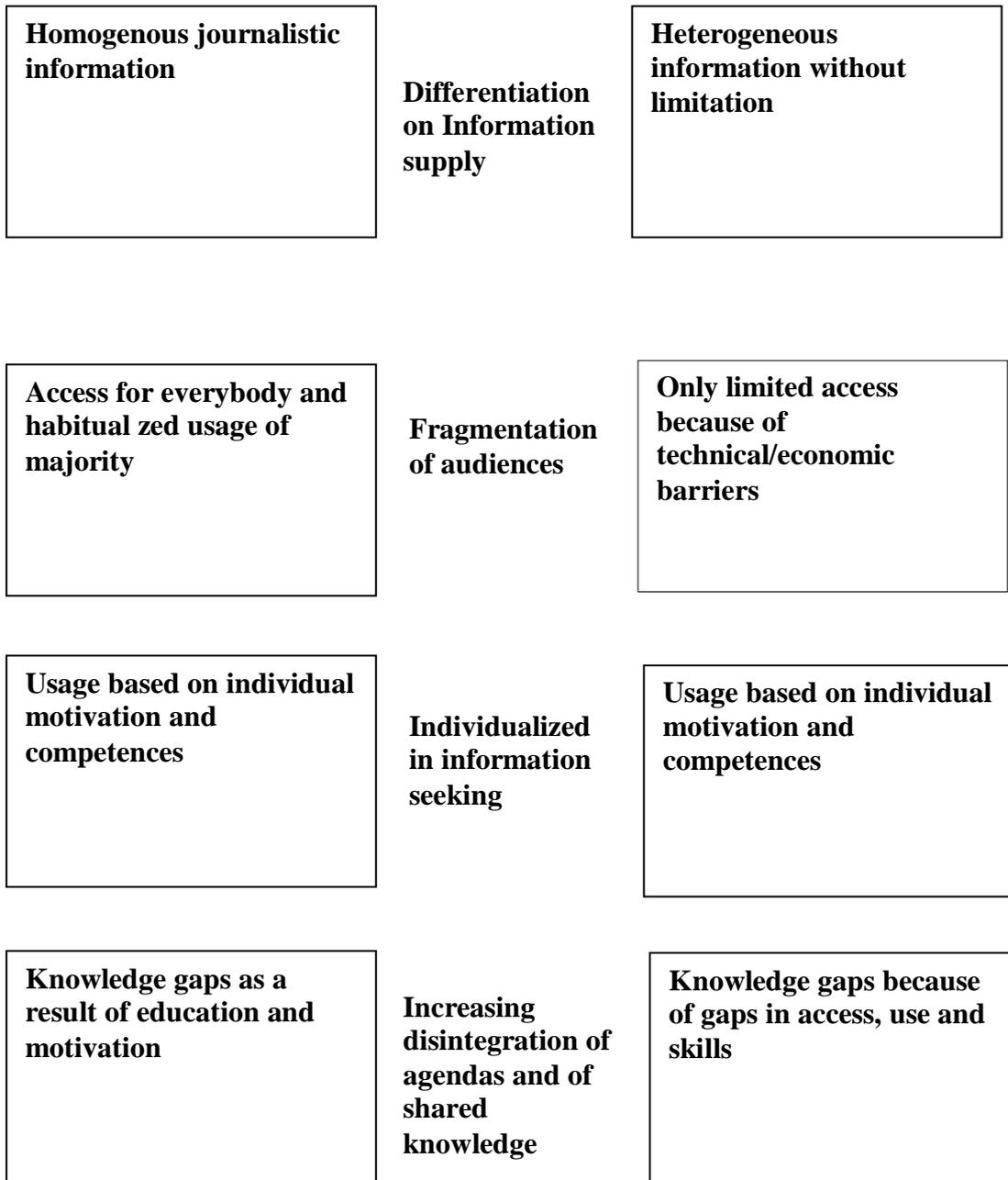
This differentiation in time concerning the origins of knowledge gaps enhances not only the conceptual clarity of the knowledge gap paradigm (Wirth, 1999: 8) but also makes it possible, for example, to optimize information campaigns directed towards specific target groups or to clarify the question whether the Internet will foster the knowledge gap or not.

A recent American survey, carried out at Stanford University by Nie and Erbring (2000), came to the conclusion that the Internet causes above all gaps in the phase of supply and access of information but not in the use of information; the question concerning gaps in the phase of reception is still open to discussion of course. In this regard it is often mentioned that meaningful use of the Internet has to be based on new skills like purposeful searching strategies, assessment of source credibility or construction of meaningful frames for interpretation. These functions are usually carried out for the audiences by journalists in the old media.

Figure 2 illustrates differences concerning the emergence of knowledge gaps between traditional media like television or the press and the Internet. Knowledge gaps in the old media seem to be mainly the result of differences in topic-related interest because overall levels of access to and use of mass media are high and there is a rather homogeneous supply of information from the mass media journalists. In comparison to the old media, new factors emerge in the case of Internet. On the one hand, the supply of information by the Internet is not structured by journalists and therefore heterogeneous and potentially unlimited, and on the other hand, access to the Internet is still restricted in most countries.

Furthermore, in comparison to the old media, use of the Internet requires a much more active and skilled user. To sum up, it can be hypothesized that in comparison to the traditional media the Internet fosters audience fragmentation and individualized information seeking; and this could result in an increasing disintegration of individual agendas and the amount of shared knowledge. That is why Doris Graber (2001) in her book *Processing Politics* asks the question: "If citizens do not drink from the same well of information, will they splinter into communication ghettos?"

Figure 2: Consequences of knowledge Gap Perspective from the Internet



Summary and Conclusions

Political slogans and claims like ‘Internet access for everybody’ should be taken seriously but considered carefully too. Internet access alone obviously does not automatically guarantee an informed and knowledgeable public. Besides gaps in access, further gaps in the content-specific use of the Internet are if one looks at the ways people connected to the Internet make use of its content. The higher the educational background, the more people use the Internet in an instrumental way, and the lower the educational background, the more people seem to use the Internet only for entertainment purposes (Shah et al., 2001). There are at least four barriers to people benefiting in a wider sense from today’s information society:

- (1) There is still a lack of basic computer skills and connected fears and negative attitudes especially among older and less educated people.

- (2) Even if people acquire basic computer skills, there can be barriers to access especially since these new media are expensive.
- (3) There are further barriers because of a lack of user friendliness.
- (4) The gaps in the way the Internet is used are mostly education based.

Taking a more theoretical perspective, not only the public debate on the digital divide but Internet research too is still based on a traditional technology-centered paradigm and therefore does not reflect the inherent complexities of the processes of diffusion, adoption and integration of the Internet as a new medium in society. As a consequence, we still do not have a deeper understanding of the so-called 'digital divide' phenomenon at the moment, since most research has presented access data only. What people really do when linked up to the Internet needs further and much more refined research.

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