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## Beyond the Digital Divide: Re-assessing Knowledge Gaps

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*Research into social exclusion is exploring how the Internet influences citizens' access to resources, and whether a digital divide (DD) now exists that creates social and economic haves and have-nots. If so, will new information and communication technologies (ICT) exacerbate or ameliorate the problem? Two New Zealand studies of information poverty suggest that dualistic constructs such as the DD, which owes its origins to studies of information richness versus information poverty, are not sufficiently robust to bear the weight of analysis of ICT's effects on society. In this paper, we propose that binary views of information impoverishment are misleading, and we describe how more in-depth ways of seeing the topic are needed to reconfigure its rhetoric. A continuum of relative information deprivation is seen as more realistic than a binary model and we offer a perspective on information poverty based on the diverse life-worlds inherent in pluralistic societies.*

An increasing amount of attention is currently being paid to issues of exclusion and inclusion in society. Over the past 30 or so years, communication scholars have been addressing in literatures such as the knowledge gap hypothesis (e.g., Dervin, 1980; Gaziano, 1997; Tichenor, Donohue & Olien, 1970) the relative state of information rich and information poor individuals in society. One aim of this scholarship has been to map communication-related manifestations of systematic exclusion of underprivileged persons from learning, economic and career opportunities.

What is information poverty? Childers and Post (1975) stated that the information poor lack knowledge of the information channels that may

be open to them, often view television but seldom read newspapers or books, do not see information as a means of solving their problems, lack the habits of active information seeking, and exist within deficient information networks.

Chatman (1996) builds on this by seeing the information poor in the context of their relationship to the privileged of society or information rich. She describes the information poor as lacking in sources of support, as missing out on the supply of information that would benefit them, as practising deception as a means of self-protection from unsupportive or threatening others, and as experiencing an on-going distrust of others.

Problems associated with systemic deprivation have recently been exacerbated by problems of access to and use of new information and communication technology (ICT). There is increasing societal awareness of the power of the Internet and the WWW to shape society and influence access to resources. In particular, is there now a digital divide (DD) that excludes some groups from social and economic opportunities, and will new information and communication technologies (ICT) exacerbate or ameliorate the problem?

Overseas there has been a burgeoning of literature on the DD, (e.g., Bolt & Crawford, 2000; Norris, 2001; Schön, Sanyal & Mitchell, 1999; United States Department of Commerce, 1999; Wresch, 1996). In New Zealand attention is now being paid to whether the advent of the PC and the Internet has created a new disadvantaged sub-class (e.g., 20/20 Communications, 2002; Computers in homes (n.d.); Residents of Newtown (2001); Taking our opportunities (n.d.). Terminology such as knowledge gaps, social polarisation, social

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disengagement, technological haves and have-nots, and bridging the digital divide is being freely used in the literature. Many of these terms are binary in nature, as though the community has created for itself a predominant metaphor expressing its anxieties about the negative impact of ICT, but very largely in dualistic terms. In this paper, we indicate our concerns about the implications of this way of seeing, and offer some alternative perspectives.

### **The two studies of information poverty to date**

#### **The Profile of Information Poverty (PIP) study**

In the PIP study we set out to profile the dimensions of information poverty in extended interviews with 20 low socio-economic status persons in Auckland, New Zealand, in a test of Chatman's (1996) six-proposition model. Briefly, Chatman's model makes six predictions: that information poor people perceive they are devoid of sources of help perceived class distinction reduces their access to information, they engage in self-protective behaviours, they employ secrecy and deception as self-protecting mechanisms, they avoid exposing their true problems, and they selectively introduce new knowledge.

Our research supported the Chatman findings that information poor people engaged in self-protective behaviour and that they avoided revealing their true problems. Others of our findings provided a contrary view in that the New Zealand respondents did not perceive themselves as devoid of social support; class distinction and privileged access to information were less salient; and there was little evidence for selective introduction of new knowledge. There was fairly equal evidence with respect to whether respondents' behaviour featured secrecy and deception.

Our overall conclusion was that information richness is an easier concept to define than information poverty. Definitions of the former usually focus on characteristics of the individual rather than take into account the characteristics of community. In contrast, information poverty

seems more a description of an "individual in community" than of an individual alone, and so we infer that the dimensions of information poverty are likely to take different shapes depending on the community in which they appear.

This study also drew attention to the distinction to be drawn between access to information and communication technology (ICT) and ability to make meaningful use of it. The manifestations of social exclusion go well beyond possession of technology, and even though quite impoverished households might well possess technology such as televisions, VCRs and even a computer, no assumptions could be made that mere possession of ICT guaranteed successful use of it for social or economic purposes.

Because of this "shape-shifting" quality of information poverty, we considered that binary conceptions were inappropriate, for the reason that a binary division tends to be founded on one of two principles, either quantity or kind. If quantity, then those with "more" at a certain point become evidently different from those with "less." This is not a useful metaphor when assessing our subject, for information (although undoubtedly a resource) is different to other resources. This is because more information will not necessarily solve a person's problems in the same way as more food will save a hungry person from starvation or money will pay your bills.

If, on the other hand, there is a binary division based on kind, then there is a tendency to focus on differences between groups rather than similarities. In turn, this lends itself to conceptualisation of the information poor as "the other," "those who are different," and so on, which is also unhelpful in describing information poverty for a different set of reasons.

#### **The New Zealand Parents as First Teachers (PAFT) study**

The second information poor study explored the New Zealand Parents as First Teachers (PAFT) programme with the purpose of discovering the communication and parenting

outcomes that accrued from intensive, one to one support of information poor parents in their own homes by trained educators. At the heart of the PAFT programme is the monthly home visit in which the educator spends an hour a month working with parents, helping them to understand and facilitate their children's development (Williams, Sligo & Comrie, 2001).

Findings relevant to information poverty from the PAFT study were that most parents stated a preference for self-reliance rather than a wish to seek support from outside their own immediate circle. Despite the need to appear self-sufficient, most of the sample (N = 16) showed a need to interact with others by means such as interacting with parents like themselves, as in playgroups. Nearly half of the sample had difficulties with transport to needed services.

Perhaps through their membership of the PAFT programme, parents were becoming tuned in to the importance of information-seeking and positively inclined to learn about parenting skills, often, they said, to break learned dysfunctional patterns of child rearing. The PAFT educators were valued highly with parents noting the support in the form of affirmation and validation that they received from this source. In our assessment of the programme, we noted the normative pressures on young parents that tended to put the onus on them to find their own solutions to parenting difficulties, despite problems of social and intellectual isolation.

In the PAFT study we saw that the parents' display of the need to be seen as self-sufficient, combined with their isolation, made it easy for educational, medical and social service authorities to categorise them as outsiders, under the information poor – information rich rubric. We identified that a more helpful approach to understanding the parents' world and assisting them to change it, was to build on their strengths. The strengths of the parents included their ability to:

- ? define their own need to change old patterns to which they had been exposed
- ? help the educator to act supportively within the parents' own circumstances

? come to see themselves (rather than the visiting educational expert) as the change agent in control.

### **What did we learn?**

Based on our two studies of information poverty, we propose that concepts such as the DD, and even information richness versus information poverty, are not sufficiently robust to analyse much further ICT's effects on society. At the heart of the problem is the dualistic character of DD and its inherited theoretical base. Binary ways of seeing information deprivation such as rich-poor, insiders-outsiders, upper class-lower class, are limiting in that they set up dichotomies that are likely to mislead.

We acknowledge some tradition in the sociological and communication literatures of binary conceptions of underprivilege, such as Merton's (1968) insider – outsider views. No doubt such an approach lends itself well to what may be a general preference for forms of explanation that state the problem in readily graspable ways, and that offer possible solutions for practitioners to implement.

We also note the mass media's liking for catchy slogans, and their preference for reporting information in ways that fit standard preconceptions. Media news reporting practices tend to reshape complex problems into predictable moulds for the benefit of readers with a small attention span. Media news values also favour conflict, celebrity, scandal and winners versus losers, into which frame, binary constructs such as rich versus poor may readily be fitted.

Even communication researchers may be attracted by dualistic conceptualisations if such a framing of the problem looks researchable or likely to attract research funders. The problem of over-simplifying evokes a long-standing issue in scholarship dating back at least to William of Occam's law of parsimony (Occam's razor), which holds that the fewer assumptions an explanation of a phenomenon depends on, the better it is. We fundamentally agree with this proposition and do not postulate that a more complex explanation is necessarily better than a simple one. Rather, we think that in the case of

the DD, simple has turned into simplistic. The essential problem with a binary conception of a research problem is that it tends to be exclusionary and lends itself to stereotyping the subjects of that research, categorising them into what may be convenient but ultimately invalid and unhelpful groupings.

The dangers of stereotyping of course increase when the topic under debate is politically contested, fraught with controversy, or representative of social divisions, as tends to be the case with the DD. We note something of a history of this problem in precursor studies to the DD, such as information-poor individuals being stigmatised by researchers as “the chronic know-nothings” (Hyman & Sheatsley, 1947).

### **Alternatives to a binary model**

Our two studies of information poverty suggest that dualistic views are misleading, and that different ways of seeing the topic are needed to reconfigure its rhetoric. We propose two complementary alternatives to a binary model. First, we argue that a continuum of relative information deprivation is more realistic than binary thinking, because it opens up more possibilities than either-or. Second, we believe that although a continuum of information poverty is better than its simpler alternative, it is also limited in that it is similarly based on polarities, albeit in a more sophisticated way. Once researchers have grasped that a continuum is better than an either-or, we next need to move on from it into the second and complementary way of seeing information poverty, which is within the frame of “different worlds.”

It may be argued, if the different worlds perspective is really better than a continuum, then why retain the latter? In fact, we propose

its retention because while only a partial explanation of a phenomenon, it probably offers a more straightforward approach to researching information poverty than the different worlds model. Each approach offers its own way of obtaining insight into a complex reality.

Thus, our second perspective is based on the assumption of different worlds and different world-views. Researchers such as Chatman (2001) have been moving in this direction, but the “small worlds” to which she alludes should not be thought of as applying just to “the other,” the world of the information poor, but instead refer additionally to the worlds that any and all of us inhabit.

### **How best to research?**

One difficulty in investigating the topic of information poverty is the question of appropriate epistemologies. We rank the object of enquiry along a scale from *metaphor* to *variable* (Table 1), ranging from most to least complex and least to most precise. Most social science and communication research has in the past favoured research done at the level of the variable as, generally speaking, this is the kind of research that finds publication. Precise results are sought, but often simplicity and precision have been obtained at the expense of meaning and social significance. In recent times a trend has started to develop across the social sciences featuring exploration at the more macro level of complexity such as metaphor, an approach that requires methods closer aligned to human intuition or insight and artistic endeavour. Different ontological, epistemological and methodological assumptions operate in research at respectively metaphor or variable ends of the continuum.

**Table 1. Ontological, epistemological and methodological assumptions of the metaphor – construct continuum**

	<b>Is normally best investigated by empirical means?</b>	<b>Is normally best investigated by intuitive or artistic means?</b>	<b>Level of complexity</b>	<b>Level of Precision</b>
<b>Metaphor</b>	Probably not	Probably	High	Low
<b>Concept</b>	Probably not	Possibly	Relatively high	Relatively low
<b>Construct</b>	Possibly	Possibly	Relatively low	Relatively high
<b>Variable</b>	Yes	Probably not	Low	High

One of the challenges we have encountered in researching information poverty is that characterisations of it such as the DD are essentially metaphors, and so are likely to evoke complex rather than simple mental connotations. A metaphor is a way of apprehending something, a new means, perhaps, of seeing some phenomenon in a new light. Often it is an aid to understanding or a way of arriving at some inference or new knowledge. While it is true that an individual may also use a metaphor to help communicate an idea to someone else, we see its especial value as its capacity to trigger an insight, perhaps an “ah-ha” response in the human mind. Since every person’s reaction to a given metaphor, (especially when thinking about a complex phenomenon such as information poverty) is likely to be unique, no two interpretations of a metaphor are going to be the same.

In contrast, a variable is a “concept that can have two or more values” (Frey, Botan & Kreps, 2000, p.442) and thus is usually (or should be) low in complexity and high in precision. Its qualities of preciseness and therefore communicability in exact terms enable us to regard it as a means of sharing information and, potentially, generating understanding.

For these kinds of reasons, research into information poverty that confuses metaphorical and variable levels of investigation and analyses is likely to come up with confused outcomes. While metaphor is a powerful means to help people think about an issue, for replicable progress it is necessary to identify research

problems that are based on reasonably precise constructs.

### **Information and inference, not knowledge**

Not a knowledge gap, an information gap

One of the difficulties in studying so-called knowledge gaps is the imprecise nature of the English language. Up until recent times it has seemed generally acceptable to use the terms information and knowledge as reasonably synonymous words. However, with increasing interest in a variety of fields in the precise nature of knowledge and information, there currently appears to be a developing acceptance that the two words have sufficiently distinct connotations as to require different terminology. In this paper our suggested definitions of key terms are: Information: data that are processed directly via the human senses; and knowledge: a personal understanding or interpretation of some information.

Following these definitions, the key distinction between data and information is that information is essentially a human preserve and may be collective, while knowledge is also the preserve of the human but is individual and cannot be collective. If the knowledge possessed by an individual is unique and so in important ways is distinct from other people’s knowledge, then there cannot be a knowledge gap as such. This is because the notion of a gap implies contrast between entities that can be compared on the same scale or measured by similar means. Notwithstanding this point, it

should also be acknowledged that knowledge is always derived within a particular cultural context, and is always understood within that cultural context.

If each individual understands things in their own special way, though that knowledge is mediated via culture, then each of us lives in a "small world," which we partly inherit and partly create by both intentional and osmotic means. We find it easier to defend the concept of information gaps (whereby people can be realistically categorised into information rich and information poor) than knowledge gaps, which implies the comparison of apples, oranges, grapefruit, pears, bananas, etc.

This paper contends, though, that we can usefully understand information and knowledge as being on a continuum of increasing complexity, with information simpler and knowledge more complex. This way of stating the differentiation between information and knowledge suggests that knowledge may be distinguished from information in two ways: by its characteristics of being more personal than collective, and more complex than simple in nature.

Therefore the nature of gaps is better suited to information (potentially more collective than individual, and more simple than complex), in comparison to knowledge. We do not argue, though, that information and knowledge should be seen as wholly discrete entities and there is probably some overlap between them. But certainly in respect of knowledge of a more complex and personal nature, gaps seem to be an unhelpful means of conceptualising differences.

Not a knowledge gap, an inferential gap

If the concept of gaps in complex and personal knowledge is not especially helpful, then how do we characterise the differing abilities of people to comprehend and use the information they receive? That is, even if two people do receive the same information, what they can infer from that information, and what use they can make of it, may differ according to their ability to see the utility or value of that information, or to build on it.

An early study that helped to define the knowledge gap research programme was Tichenor, Donohue and Olien's (1970) account of research that explored the estimates by respondents educated to college, high school and grade school levels as to when there was likely to be a live landing on the moon. The researchers found that over a 16-year period college educated respondents were significantly better able to identify the probability that a moon landing would occur, in comparison to high school graduates, and the latter were more accurate than grade school persons, and this they characterised as a knowledge gap. Respondents' success therefore seemed to stem from a better command of information in the media, plus what they were able to derive from it.

However, we find it difficult to see this as a knowledge gap as such. The better educated people could not "know" the date of the first manned landing better than the less educated, because no one could give a valid statement of just when the moon landing would occur. Where the better-educated people won out was on their ability to infer a probability based on information in the media. In this way, we distinguish between knowledge and inference. An inference refers to a capacity or willingness to reason or surmise based on information. Inference is commonly understood as a form of reasoning based on either deduction or induction, and it may overlap with noticing (Starbuck & Milliken, 1988), interpretation (Isabella, 1990) and may be close to sensemaking (Weick, 1995) (except that sensemaking seems to be retrospective, while inference may have more to do with the present or future).

What people can reasonably infer from what they already know depends on what they understood in the first place. Possible inferences from known facts could include, for example, what might a person learn from this data, what use might a person make of it, why is it important, what might lead from it, what does the participant think that the researcher is looking for in this situation, etc. We also surmise that the ability to infer from known data might be similar to the ability to be entrepreneurial, if entrepreneurial ability is

something to do with seeing possibilities that others may not (then acting on them).

### Future research

The nature of how people infer from existing known facts is complex, but could offer some prospects for exploring the boundaries between information richness and poverty. Research may even go beyond the ability to infer, and start to consider people's ability to think creatively or entrepreneurially on the basis of their existing data, while at the same time assessing the barriers to that process inherent in the condition of information poverty. If, as already suggested, entrepreneurial ability is something to do with seeing possibilities that others may not, then acting on them, then research may find its future in the study of creativity and innovativeness.

We also believe it is essential to craft research in such a way that it builds on the strengths of individuals and communities. Diversity offers a challenge in its inevitable questioning of the assumptions of the status quo, but it is also an opportunity to reveal new ways of seeing and a richer form of community.

Instead of the digital divide, we need to think in terms of "digital enablement," but such enablement needs to be first on the terms of the users. A command of PC functions and the Internet will enable different subcultures to foster their own priorities, to build their own sense of self-efficacy in computing and elsewhere, and in this way to break down a sense of separateness from society. Once former non-users are confident in their new use of computing systems then they are much more likely to participate in the mainstream digital economy.

### References

- 20/20 Communications Trust (2002). Retrieved April 4, 2002, from <http://www.2020.org.nz/>
- Bolt, D., & Crawford, R. (2000). *Digital divide: computers and our children's future*, New York: TV Books.
- Chatman, E.A. (1996). The impoverished life-world of outsiders. *Journal of the American Society for Information Science*, 47, 193 – 206.
- Chatman, E.A. (2001). *Quincy Slim, travellers, nickel hoppers and me: Discovering theoretical understanding of information worlds*. Keynote paper presented at the Annual Conference of the Australian and New Zealand Communication Association, July 2001, Edith Cowan University, Western Australia.
- Childers, T., & Post, J. (1975). *The information poor in America*. Metuchen, NJ: Scarecrow Press.
- Computers in homes: Beyond the digital divide (n.d.). Retrieved April 4, 2002, from <http://www.computersinhomes.org.nz/ddivide.htm>
- Dervin, B. (1980). Communication gaps and inequities: Moving toward a reconceptualization. In B. Dervin & M.J. Voight (Eds.), *Progress in Communication Science*, 2, Norwood, NJ: Ablex.
- Frey, L.R., Botan, C.H., & Kreps, G.L. (2000). *Investigating communication: An introduction to research methods*. Boston, MA: Allyn & Bacon.
- Gaziano, C. (1997). Forecast 2000: Widening knowledge gaps. *Journalism and Mass Communication Quarterly*, 74(2), 237-264.
- Hyman, H.H., & Sheatsley, P.B. (1947). Some reasons why information campaigns fail. *Public Opinion Quarterly*, 11, 412 – 423.
- Isabella, L.A. (1990). Evolving interpretations as a change unfolds: How managers construe key organizational events. *Academy of Management Journal*, 33, 7-41.
- Merton, R.K. (1968). *Social theory and social structure*. New York: Free Press.

Norris, P. (2001). *Digital divide? Civic engagement, information poverty and the Internet worldwide*. New York: Cambridge University Press.

Residents of Newtown set to get smart (2001). Retrieved April 4, 2002, from [www.wcc.govt.nz/news/press/2001/mayor/nr000493.htm](http://www.wcc.govt.nz/news/press/2001/mayor/nr000493.htm)

Schön, D., Sanyal, B., & Mitchell, W. (1999). *High technology and low-income communities: prospects for the positive use of advanced information technology*, Boston, MA: MIT Press.

Starbuck, W.H., & Milliken, F.J. (1988). Executives' perceptual filters: What they notice and how they make sense. In D.C. Hambrick (Ed.), *The executive effect: Concepts and methods for studying top managers* (pp.35-65). Greenwich, CT: JAI.

Taking our opportunities (n.d.). Retrieved April 4, 2002, from <http://www.knowledgewave.org.nz/document/s/Social%20Cohesion2.pdf>

Tichenor, P., Donohue, G., & Olien, C. (1970). Mass media flow and differential growth in knowledge. *Public Opinion Quarterly*, 34, 159-170.

United States Department of Commerce. (1999 July, revised November.). *Falling through the Net: defining the digital divide: a report on the telecommunications and information technology gap in America*. Washington, DC: United States Department of Commerce.

Weick, K.E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA.: Sage.

Williams, J., Sligo, F.X. & Comrie, M. (2001). Walking the path with new parents: Information provider interaction with families to foster change. Paper presented at National Social Policy Conference 2001, University of New South Wales, Sydney,

<http://www.sprc.unsw.edu.au/nspc2001/ContributedPapers.asp>

Wresch, W. (1996). *Disconnected: haves and have-nots in the information age*. New Brunswick, NJ: Rutgers University Press.

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