What we know about information seeking and use and how research makes a difference in our knowing[1]

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Abstract. This paper summarizes what is known about everyday health information seeking and use, as supported by empirical research largely conducted during the 1980s and 1990's. It draws implications for research and system design applicable to the U.S. National Library of Medicine's (NLM) MedlinePlus web portal and data base of consumer health information. Its focus is on the two academic disciplines that bear most directly on information seeking and use, each with different perspectives. Communication (COMM) whose orientation is the study of messaging and the effective transmission of information, and Library and Information Science (LIS) whose focus is on meeting user information needs. Although there is very little overlapping literature, Dr. Dervin's career was spent working across these two research genres. She is known most prominently for her Sense-Making Methodology. Dr. Dervin supports the view that there are more commonalities than differences between the two disciplines, and that research focusing on the commonalities provides a better opportunity for accounting for more variance in human information seeking than the highly compartmentalized approaches that dominate the study of information seeking. Dr. Dervin's first-person review of these literatures was commissioned by NLM in 2001. It remains relevant today both for its critical insights, and as an historical resource. It is published posthumously in 2023 in tribute to Dr. Dervin on her recent passing.

Keywords: Health information seeking, communication research, library and information science, sense-making methodology, MedlinePlus, U.S. National Library of Medicine

Introduction and overview of purpose

My purpose in writing this paper is to summarize what I understand about everyday health information seeking and use as supported by empirical work; and to draw out the implications of this understanding for research and ultimately for information system design. My guiding focus is the National Library of Medicine's (NLM) desire to get a handle on how MedlinePlus can be maximally useful and used by its mandated users, and how to conduct research to create useful input for website design.

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[1]This paper was originally written in 2001 by Dr. Brenda Dervin when she was Professor of Communication at Ohio State University. It was submitted in partial fulfillment of a contract between Dr. Dervin and the U.S. National Library of Medicine, National Institutes of Health. The paper is in the public domain as a work product paid for by the U.S. Government. Dr. Dervin died on December 31, 2022. Dr. Elliot Siegel, Editor-in-Chief of *Information Services and Use* was the contract's Project Officer and arranged for this commissioned work to be published posthumously in tribute to Dr. Dervin.

I will implement my purpose with a propositional journey through my understanding of everyday citizen health information seeking and use in a way that allows me to illustrate why I approach research problems as I do. To this end, in this essay I focus extensively on two academic disciplines and the work they do that is relevant to health information seeking and use. It was not my intent to provide such an extensive background paper but as I dug into the literatures it became apparent that I had to in order to communicate well. The two literatures that pertain most directly to health information seeking and use include one from the communications field (COMM) focusing on information campaign design; the other from the library and information science field (LIS) focusing on information seeking and use. The difficulty is that there is very little overlap between these two literatures and, in fact, the portrait that one gets of information seeking and use from the two on the surface seem entirely unrelated to each other. Since my goal is to present a propositional overview of what I think we know with reasonable evidential support I had to come to grips with the seeming incommensurabilities of these two fields. In short, I had a nagging feeling that there was insight to be gained from the effort even though it took far more time than intended.

Throughout this paper I will refer to the members of the mandated publics of institutions by a variety of names – patrons, patients, users, publics, audiences, clients, customers, and so on, depending on the research literature I am drawing from. In all cases, my intended focus is the designated persons whom an institution or system is mandated to serve even if only a small percentage are actually served. In addition, I will draw on research from beyond the health information context when I think it helps flesh out the portrait. I do this because research shows, as I emphasize in my propositional presentation below, that the substantive focus of information seeking generally accounts for less variance in information seeking and use than other factors and that many important aspects of information seeking and use are generalizable across substantive contexts.

I proceed in five sections:
#1: A background commentary on two academic disciplines
#2: On health information seeking and use: the public communication campaign literature
#3: On information seeking and use in context: the library and information science literature
#4: On online communication: more of the same
#5: Implications for research

1. A background commentary on two academic disciplines

What seems like a simple task is in actuality not so because it requires that I share as briefly as possible my understanding of what these two disparate literatures have to say that is pertinent. The difficulty is that these literatures say different things. The problem is not so much in the evidence these literatures present which do not so much conflict as provide potential insights about this or that piece of what seems on the surface to be two different puzzles. The puzzle pieces rarely seem to even touch or in many cases to cohere around the same end. Further, it is highly contested whether the puzzle-making model of discovery is even an appropriate one for the social sciences. Bottom line, the problem is that the interpretive frames within which research is presented necessarily drives how evidence is collected and interpreted and it is here that these disparate research approaches seem at least on the surface to be incommensurate.

The problem requires attention because it is otherwise hard to understand why the portrait of citizen information seeking and use that one gets from viable but disparate literatures seems so entirely different. Does demography and personality predict information seeking and use as one research genre seems to suggest? Or not, as another contends? Does cultural context provide avenues for more effective health

provision, or not? Are quantitative surveys an effective way to learn about users? Or, are there efficient and effective alternatives? And, so on.

None of these questions has simple answers except when answered within narrow literature confines. If one looks broadly, little is straightforward because, in fact, the social sciences are in disarray [28,29,55,57]. There are a wide variety of competing "paradigms" which have very little communication with each other. In psychology, for example, there are sub-fields – clinical, social, ecological, and humanistic – which have very little overlap with each other and present increasingly disparate findings even about the same phenomena. In sociology, there is a marked divide between quantitative and qualitative approaches even when they focus similarly. The same is true of anthropology with its recently emerging thrusts into, for example, critical and dialogic anthropology in contest with traditional anthropology. And, the communication field for a variety of reasons is even more marked by polarities and disparate camps without communicative bridges between. Communication mirrors sociology in its division into qualitative and quantitative camps; and is further riddled by lack of robust dialogue between US scholars and communication scholars in the rest of the world This is an especial loss because in fact there is strong evidence that capacities to dialogue across competing paradigms are stronger in the academy outside the United States, particularly in Scandinavia, New Zealand and Australia, and Canada.

Traditionally we would think that these divides could be transcended with quality state-of-the-art-reviews and meta-analyses and indeed some useful ones do exist within genres. However, there are few that focus between genres because the fundamental difficulty is not lack of synthesis of evidence, but lack of tools for comparing seemingly disparate research approaches [28,29,55,57]. Bottom line, the ways in which these disparate research genres ask questions and answer them are so radically different that on the surface they do appear incommensurate.

It is too easy to say that the approaches differ methodologically because in fact there is very little explicit attention to methodology in any social science research today [48]. In quantitative studies methodology is reduced to method as if the mapping of random error is sufficient assessment. In qualitative studies it is usually reduced to philosophic critique. But little research attends explicitly to building bridges between theoretic assumptions and methods defined broadly – the methods of framing questions, as well as collecting and analyzing data and interpreting results. Comparison of why different research genres approach the same phenomena in such different ways with such different results requires methodological comparison. We are bereft of even a discourse which would allow such comparisons.

Our difficulty synthesizing across research perspectives is additionally compounded because we lack sophisticated tools for meta-analyses of research that are useful across different research approaches. While once (in the 70s) there was a trend emphasizing that all quantitative research should report variance accounted for, now we see such figures only in very constrained genres of attention (e.g. public communication campaign penetration and effect rates is a notable exception as exemplified by Snyder [206]). When, we move from more straightforward persuasion and impact studies to studies attempting to test complex theories, the problem of comparing results becomes more difficult. Finally, when we move from quantitative studies to qualitative, we see in some quarters a rejection of any kind of meta-analysis across contexts and more generally a lack of frameworks for doing so.

Despite these difficulties, my own research trajectory has traveled across these two research genres in good part because a central focus of its mission has been to build bridges between them Further, my work is anchored in a wide variety of fields which on the surface makes its trajectory look capricious. But, in fact, in all applications I have focused on how to conduct research to assist in the design of more useful and effective communication and information systems. This is an important point for understanding what I write below. I take it as a given – an assumption based on evidence – that there are more commonalities

in information seeking and use across substantive contexts than uniquenesses and that, in fact, research focusing on these commonalities – what I call the universals of human sense-making and sense-unmaking – provides us better avenues for accounting for more variance in human information seeking than the highly compartmentalized approaches that dominate the study of information seeking.

The Sense-Making Methodology which I have been developing since 1972 has been developed as a tool for this alternative way of thinking about information seeking and use. Its development has been pursued in many contexts with the primary mission in each context being to find better ways to think about and study users (i.e. audiences, mandated publics, patrons, patients, citizens, readers, and so on) permitting more effectiveness research which more usefully informs the design of communication/information systems and practices. A constant challenge in this work has been, for example, how to conceptualize needs so as to permit comparisons across applications contexts; or, how to conceptualize users so as to increase research capacity to account for variance in predicting use.

Even though this work represents multiple applications, the research has all had the same purpose as specified above and is brought to bear here as one cumulative body including studies by Dervin and some of those by others using Dervin's methodology in whole or part. The application contexts include studies of:

*health information seeking and use [12,20,37,73,74,77,79,80,102,163].

*environmental information seeking and use [144,160]

*users of libraries and information systems [47,48,51,56,68–70,78,255]

*everyday citizen information seeking and use and sense-making [5,39,48,51,60,85–87,164,168].

* information seeking and use of professionals [36,221]

*information use by targeted campaign audiences [51,52,58,63,72,83].

*communication/information gaps between "haves" and "have nots" [59,62,64]

*researching journalistic audiences and designing more communicative journalistic systems [71,75,92,122,213]

*the uses and perceptions of users of telecommunication systems [52,83,199]

*participant dialogues (in person and online)in multiple settings (e.g. informal, organizational, governmental, citizen participation) [54,66,76,81,82,198]

*organizational knowledge management [50]

*patrons and audiences of arts institutions, popular and elite [84,100]

Along with [27–29], [223–225] and [216–218], I share a belief that if the communication field can construct methodologies which focus on communication as communication we would be advancing toward approaches which would free the communication field from its reliance on other disciplines whose focus is truncated to particular levels of analysis (i.e. psychology for the individual; sociology for the collective; anthropology for the spatially bound collective) rather than to communication processes which serve as linkages between levels [51,53,55,57,66,67].

It is because of this background that I am bringing to bear on this position paper my understanding of what we know about everyday citizen health information seeking and use drawing on two primary literatures: the communication (COMM) field's study of health information seeking in the context of public communication campaigns; and the library and information science (LIS) field's study of information seeking and use.

Each of these literatures is, of course, served by other literatures. Health information seeking and public communication campaigns, for example, overlaps the extensive work in health communication generally, as well as work using personality predictors of health behaviors (e.g. locus of control as predictor

of responses to uncertainty in health situations), the persuasion literature (e.g. testing alternative ways of framing messages and attempting to map these alternatives to cognitive predispositions and other personality attributes of audience members); and a variety of literatures outside the COMM field which focus on physician-patient interactions. Information seeking and use research in LIS overlaps with related genres: e.g. work on information retrieval, data base searching, classification, indexing, and so on. In my judgment, the two literatures I have selected for primary focus here are most pertinent to the propositional narrative I want to present below and within themselves provide a sufficient portrait of relevant related literatures. Adding the related bodies of work will add detail but not change the direction of the narrative.

I do occasionally add ancillary literatures from what could best be termed the cutting edge of health studies – e.g. work from medical anthropology, ecological psychology, and contextual psychology, as well as qualitative approaches to health communication, nursing, and public health. An interesting aspect of the difficulty one faces trying to get a handle on what we know in these terrains is that in fact the ancillary literatures rarely inform the primary COMM and LIS literatures even when their general sensibilities are in agreement and when the ancillary literatures add important new understandings. Another interesting aspect is that these cutting edge literatures tend to rise from the human support systems of health care delivery rather than its core expertise systems. It is fair to say generally that knowledge experts (e.g. subject specialists) focus on transmission more than communication while their support systems (e.g. librarians, nurses) focus more on dialogue.

In building my portrait of what we understand about health information seeking and use, it is important to understand that although my own work has a significance presence in both COMM and LIS research genres it does not have a straightforward relationship to either. Sense-Making Methodology [48] draws primarily for its methodological viewpoints on the work of theorists and methodologians in the COMM field but not the part of the COMM field that informs most of those doing research focusing on information transmission and campaigns. While the subject is complex, briefly it could be said that my work is informed by interpretive and qualitative scholarship even though I apply the results to quantitative scholarship as well as qualitative. In the COMM field when it comes to compilations that focus on information seeking and use, you will see citations to my work and generally I am identified as in the top 5% of communication academics in terms of productivity and citations. But clearly, I am not a player in the COMM field's approach to campaign studies, which is also the primary terrain where the COMM field focuses on information seeking and use. More of this issue below.

On the other hand, in LIS many would label my work as *the* major force. It's impact has been measurably significant. [233, p. 457] noted that the [78] set new directions for studying information seeking and use in LIS and that "… Dervin has today the most marked metatheoretical influence on the studies of INS (information seeking). Williamson [245, p. 337] commented in the same volume that the theoretical contribution of Dervin "has been profound". Others in LIS have written review articles on Dervin's work [158,162] and there is currently a LIS doctoral dissertation in preparation in Australia focusing on the constructing of meaning and significance of Dervin's work in the LIS field. A citation analysis by McKechnie, Pettigrew, & Joyce [152] named Dervin along with Kuhlthau as the two most cited theorists in human information behavior research. The differences in the impacts of my work between COMM and LIS are another illustration of how disparate these two fields seem.

However, both the COMM and LIS literatures offer us some understanding of health information seeking and use. Both fields focus on non-expert information seeking and use. From the field of COMM with its focus on health communication and communication campaigns research, the traditional framework has focused on assuring that appropriate health care is delivered to citizens. The central theme of this work has been gaining compliance – organizing informational messages and health care delivery

in such a way that there is an increased probability that patients will comply with prescribed medical treatment or citizens will attend to their health in mandated ways. From the field of LIS with its emphases on information seeking and use, the traditional framework has focused on serving needs – assuring that a seeker goes away from the information system with informational help.

Despite the differences in their mandates, up until the mid 1980s at a foundational level there were marked similarities in the literatures of these two fields. For both, the task at hand was one of getting the right information to lay people. For the communication field this was conceptualized most often as a task of enticing attention, persuading viewpoint, and encouraging behavior, all by using appropriate information. For the library and information science field, this was conceptualized most often as a task of facilitating access and mediating system structures to link the user a need with appropriate information.

The societal challenges which became increasingly evident as we moved into the 1980s impacted both fields. Both faced growing recognition of the diversities of their mandated publics particularly in terms of gender, culture, and class identities. Both faced the exponentially growing information stockpile and the understanding that their "information" – the stuff they transmit to their publics – was but a tiny point in an increasingly chaotic, disorganized, uncontrolled, and rapidly growing information environment. And, both faced the cynicism and malaise increasingly associated with the idea of information (or knowledge) as having uncontested and neutral expert foundations.

For both fields what was formerly thought of as primarily a task of well-orchestrated information transmission became infinitely more complex Given the logics of their original mandates it is not surprising that the two fields responded by pursuing different paths.

The COMM field saw itself facing growing evidence of the limited effects possible from health communication campaigns, and low compliance rates with medical prescriptions. Researchers set themselves for the most part to the task of finding ways to get the best results they could but with lower expectations. The result of this journey is exemplified by the excellent compilation by Rice and Atkin [185] in which a wide variety of strategies are reviewed. In essence, the communication approach to health information remained one of focusing on persuasion and compliance but with more modest expectations and with greatly complexified roads for getting there. Research began to pursue, for example, multi-variate models for predicting campaign impact [149].

Many arguments could be advanced of why LIS traveled a much different road because in fact fundamentally both COMM and LIS as fields of practice rest for their ultimate measures of accountability on their communicative success with individual members of their mandated publics. But fact is that the COMM fields had never relied conceptually on an assumption of effective communication to each individual member of an audience. In contrast, LIS as a practice measures itself on such personalized and effective services. Hence, the forces of now apparent diversity and complexity in society hit LIS practitioners in ways that only became visible much later to the COMM fields. The result in the LIS field was a period of deep reflexive evaluation of purpose and some of the first robust calls for "user-oriented" approaches to research.

The result was a marked turn in how LIS studied its users. The turning point is usually punctuated with the Dervin and Nilan [78] review [158,233] focusing on information needs and uses in which they called for a turn from transmission theories of users to sense-making or interpretive theories. There are still transmission studies of information seeking and use in LIS but they co-exist side-by-side with interpretive studies and discussions in LIS engage the contests and disagreements between approaches. These debates inform LIS research and have allowed LIS research to move in deliberate albeit struggling steps toward a more holistic approach and to more heuristic theorizing. In my judgment this is why

in general LIS is producing more useful research for understanding information seeking and use in an electronic information environment than is COMM.

As background it is important to understand that the same kinds of calls for an interpretive turn were made in the communication field (e.g. [29,57,218,224]) but in communication for myriad reasons a bifurcation resulted with the transmission orientation to communication and the interpretative orientation to communication ending up for the most part in separate literatures with relatively little overlap between. Hence to this day one can readily identify in the field of communication those scholars who take transmission orientations to their studies and those who take interpretive orientations. The former are usually quantitative; the latter qualitative. The former most often rely on persuasion oriented theories to guide their research, focusing on what produces greater attention, attitude change, behavior change, and so on. The latter focus on understanding how information users make sense of the health related life situations or understanding the forces of society and culture which constrain such sense-making. Both poles argue methodological issues but usually only within their genres. For the most part even departments of communication in Class I research universities increasingly show the same bifurcation. And, for the most part, the literatures from the two poles do not inform each other. Hence the meaning-making thrust in health communication literature exists quite independently of the focus on introducing change in the health communication campaigns focus. In even a single journal devote to health studies (i.e. *Journal of Health Communication)*, one finds the same disparities.

Further, in actuality, explicit study of user information seeking and use has not been an explicit focus in COMM studies since the late 70s and early 80s. At the more quantitative end of the COMM field with its focus on transmission and persuasion, information seeking and use has been mostly hidden in studies of knowledge gain resulting from message transmission – i.e. do patients get the doctor's information; do campaign audiences learn the intended facts. At the more qualitative end of the COMM field with its focus on interpretation, studies have often marginalized the concept of information as outside its theoretic purview and focused instead of meaning-making. Or, they have examined how what society calls information is inscribed by and in societal forces.

The situation in LIS is entirely different. The same paradigmatic and methodological tensions exist but they are muted and remain in dialogue. The result has been the emergence of an identified literature genre now labeled "information seeking in context" established formally in 1997 with the publication of the first conference proceedings [235] and followed by, in turn: [119,120,247].

An interesting impact of the LIS versus COMM field difference is that the LIS field is not as constrained intellectually by the current emphasis on cultural differences as the answer to communication dilemmas. Both LIS and COMM moved from transmission theories of communication to cultural relativistic theories and then to constructivist theories (which can be conceptualized as a more detailed relativism, now applied at the individual rather than cultural level). Both tumbled from there into the postmodern crisis [53,54]. What happened next differs because the COMM field bifurcated into divisions that represent the different steps of the journey – transmission, cultural relativism, constructivism, and postmodernism. In contrast, LIS's studies of information seeking and use took all four perspectives onto one road. For this reason, in LIS studies of information seeking and use cultural differences have taken their place among a battery of alternative predictors. It is fair to say that for the COMM field the primary research work that is being applied to understanding information seeking and use and compliance still focuses on demographic, personality, and lifestyle differences as the primary means of differentiating users with cultural identification being a much emphasized current approach. In contrast, in LIS the primary means of differentiation has moved to descriptors of context, situation, and practices. In an important way, in the COMM field the unit of analysis remains the person; in LIS it has become the moment of intersection

between user and system. As Zweizig & Dervin [256] termed it, the focus has involved a move from looking at use to users to uses.

The discussion I have presented above rests, of course, on stereotypes. In between the cracks of the main thrusts of the portrait I present above we find ourselves in the best and the worst of times for social science scholarship. It is both exciting and confusing because the dust of the postmodernism crisis (e.g. objectivity versus subjectivity) has settled a bit so researchers are searching for viable mediating alternatives, and because the new technologies offer flexibilities in literature review as well as data collection and processing not before possible. Young scholars in particular are abrading their boundaries; and wherever one looks at the cutting edge one sees calls for genuine dialogue across fields and at the same time calls for approaches that break out of old restraints. The propositional review below absorbs these innovations to the extent that cumulative evidence warrants it.

Finally, before proceeding, it is important to distinguish between the rhetorical needs of a political climate and what evidence says about human behavior. Two examples will suffice.

One concerns expertise, particularly medical expertise. Despite considerable evidence about the elusiveness and changeability of medical knowledge and the struggle of patients as well as doctors coping with overwhelming contradictions in the medical information marketplace, medical knowledge systems still rest in practice on transmission assumptions. Any recommendations regarding system design and practice must be sensitive to this gap between evidence and normative practice.

The second concerns cultural differences, the by-word of the current moment for accounting for differences between people. Evidence shows that in fact class and education and geographic locale are usually far stronger predictors than ethnic identity per se; and further that when people who are culturally different see their worlds similarly they are more like each other in terms of sense-making and sense-unmaking than if they are culturally the same but see their worlds differently. Given this evidence – which I will present below – if we speak based on evidence alone we might suggest that there are more efficient ways to conceptualize differences than culture. In fact, cultural differences when reduced to ethnic and demographic attributes fast generate an astonishing number of different ways one must design and implement communication. Take, for example, only ten identity attributes with two values each. Intersecting them yields more than one thousand possible communication designs if the intent is to appeal to each identity sub-group (e.g. a group of older Hispanics, recently immigrated, living rurally, and so on). However, the more fundamental issue for our societal moment is not the impracticality of what I will call below a "noun" framework for understanding difference. The more fundamental issue is that it is simply not rhetorically appropriate to de-emphasize cultural categories even if they do not predict well. Further, it is also true that evidentially there are conditions when culture is highly predictive. So the more important goal is to identify the conditions under which cultural differences are important to communication design. I will speak to the issue of how to navigate these contradictions below.

In proceeding below, I generally focus on the COMM literature in the first section of the presentation; and the LIS literature in the second. Occasionally, I cite work from one area to support the other and vice versa. My format for the presentation of propositions is to present the propositions as a continuing coherent narrative illustrating under each proposition with relevant citations from the literature: studies, as well as theoretical essays and state-of-the-art-reviews. I do attempt to provide some degree of detail in reporting studies because I am attempting to find connections between work ordinarily thought of as disparate in focus so I want to make the connections I see more visible.

2. On health information seeking and use: the public communication campaign literature

2.1. Source-oriented

Traditionally, the COMM field has not focused on information seeking and use as a focal phenomena for study. Rather the phenomena of interest has been compliance gaining via message construction and campaign design. Traditionally, the approach has been source-oriented. The view is based on institutional maps of the world, not the maps of people-struggling-in-situations. The information presented is framed within a world view as defined by the expert institution, which has often focused on victim-blaming and been ignorant of the experiential conditions and societal constraints within which lay persons make sense of the world. This impact of this difference on possible effectiveness seems fundamental given our basic understandings of how communication works; yet this is still the major criticism to be launched against most public communication campaigns.

*Myrick [161] in his assessment of the effectiveness of a state-run HIV prevention campaign in Alabama targeted to African-Americans noted that the target audience saw the campaign as involving a white power structure targeting a minority audience as in need of repair.

*Tardy & Hale [220] reported from their participant observation study of mother's conversations relating to health and illness that the conversations served to "crack the code" of institutional messages and practices and at the same time allowed the women to bond to each other. Their data led these researchers to say that "what is labeled noncompliance in the institution could be labeled strength or survival outside the institution; not survival of the body, perhaps, but survival of identity and spirit". (p. 153)

*Baer [7] concluded from his study of perceptions of health – physical and mental – that the biomedical categories of health institutions may be inappropriate not only to ethnic minorities but also to the mainstream population. He said of his informants that "… their ideas and formulations of this domain of existence were so different from the ways these issues were categorized by the NCHS [National Center for Health Statistics] that the questions seemed irrelevant to their lives and very "distant" from their daily concerns. (p. 63)

*Brendlinger, Dervin & Foreman-Wernet [20] concluded that a traditional health department survey of knowledge resulting from an HIV/AIDS awareness campaign tapped how well audience members had memorized the institution's story but was missing altogether how respondents constructed their own pictures.

*Sobo, Zimet, Zimmerman & Cecil [207] came to the same conclusion in their review of AIDS campaigns. They suggested that in their study of adolescent runaways high AIDS "knowledge" scores reflected rote memorization rather than comprehension and application.

*Nelissen, van Eden & Maas [163] in their Sense-Making study of practitioners and patients in a comprehensive cancer center found that while health practitioners focused on medical information, patient question-asking focused more on non-medical questions.

*Dervin, Jacobson and Nilan [77] found much the same in their study of information seeking and use by blood donors – much of the question asking focused on issues which information systems traditionally term "subjective". In this context, many donor questions focused on blood donors' struggles with themselves.

*Dejong & Wallack [46] evaluated the drug czars antidrug media campaign as ignoring the best of campaigns research in its development. In particular, the campaign neglected issues of audience involvement and efficacy.

*Any number of campaign studies still take a blame-the-victim stance toward campaign failures. Often, these unwittingly take on racist and stereotyped stances. For example, Donnelly, Mowery, and McGarver [89] judged their inner-city African-American mothers as having inadequate knowledge about substance abuse. Yet knowledge levels were above average when compared across a large number of campaigns in a variety of communities [206]. Or, Stephenson & Witte [215] concluded that "… most people are incapable of accurately assessing their own vulnerabilities to risky health behaviors. Yet, Klingemann [128] challenged risk related research as being obsessively oriented toward defining risk taking as negative when in fact voluntary risk taking is part of both human life-facing and even human pleasure-seeking. And, Dervin, Harpring & Foreman-Wernet [74] emphasize on interviewing approaches can easily yield distorted, and shallow pictures of what is really going on in how people make sense of their health struggles.

*Hillier, Harrison & Warr [117] evaluated safe sex campaigns to adolescents and concluded that they neglected teenager social contexts and the realities of their lives and paid virtually no attention to assisting teens with the barriers they saw to implementing safe sex alternatives.

2.2. Bad guesses

Because of their focus on institutional frameworks, message and campaign designers often make wildly wrong guesses about what publics do and do not want. These guesses are usually erroneously confirmed by the usual approaches to survey research because of the ways in which researchers unwittingly constrain their data collection to yield the very answers they expect.

*Carlson, Siegel, Wang, Jichaun & Faick [26] in their ethnographic and survey studies found evidence that contradicted the common myth in public health literature suggesting that drug users find needle-sharing a desirable behavior.

*When the California Public Utilities Commission mandated informed consent for its citizenry prior to the introduction of caller id, a marketing firm proposed an education campaign based on the assumption that the public for the most part would not care. Dervin [52] noted in her assessment of the proposed campaign that research increasingly showed the general public to be very attentive to privacy issues.

*From qualitative audience and policy studies of health mandates have come insights on how health campaigns ignore social realities. Dievlar & Pappas [88], for example, noted how the common focus on race and ethnicity as a predictor of health behaviors and susceptibilities ignores the fact that social class and economic issues are as likely to offer better explanations. The problem is made even more difficult because popular media sometimes offer highly distorted views of medical realities as for example in television's treatment of HIV/AIDS as a deviant and stigmatizing disease [231].

*In a Sense-Making study of information seeking in leisure time situations, Spirek, Dervin, Nilan & Martin [213] compared information seeking as it occurred while reading newspaper leisure time coverage versus as it occurred in natural everyday settings. The questions asked were significantly different. Further, a comparison of question-asking in natural situations by college students versus those asked by a general population sample showed few significant differences.

2.3. Compliance is an institutional concept

Compliance as a construct is derived from an institutional map of the world. Human beings struggling with situations as they move through time-space do not refer to their actions as compliant, or non-compliant. They naturally refer to struggles, useful information, useless information, constraints, and so on.

*The struggle with "who is the blame" for the relative lack of success of compliance gaining activities has been, of course, a continuing theme for attention since Bauer's [14] germinal piece on "the obstinate audience". Dervin [58,63] summarized this work by suggesting the operating metaphor was one of conceptualizing audience members as if they were empty buckets. The obstinate audience includes buckets who are either leaky (with holes in the bottom), or stubborn (with lids put on tightly).

2.4. Decreasing trust

Decreasing public confidence in expert information and the institutions mandated to supply it has a major impact on communication effectiveness making both attention and impact harder to achieve. This phenomenon is generalizable across the US population.

*A recent Pew funded study documented that citizen evaluations of governmental institutions were as low as their evaluations of lobbyists – at the bottom of the institutional credibility grid. (www.pewtrust.org, 2000).

*Sobo, Zimet, Zimmerman & Cecil [207] cited a series of studies showing "considerable mistrust" of statements regarding HIV/AIDS made by experts. Some studies showed as many as 20% of African American men as seeing AIDS as a governmentally sponsored form of genocide. In one study, the figure was 65% for African American religious leaders. Other studies showed that as many as 40% of adolescents did not trust government information on AIDS.

*Siegel and Ravels [200] found their minority (African American & Puerto Rican) male informants both judged social service organizations as disinterested in them.

*Guttman, Boccher-Lattimore & Salmon [108] found a widespread mistrust in expert information regarding the probability of AIDS transmission.

*Tardy & Hale [220] found their informants – young mothers in a toddler's playgroup – distrustful of physicians.

2.5. Ignoring social forces and ethics

A recent trend in campaigns research – an important one in the context of this background paper – is the turning of attention to placing the campaign in a larger political, social, and economic context. It has been widely argued in recent work that this lack of attention has been a major weakness in both campaign research and design. Ignoring these larger contexts, some charge, is at best simply bad communication top-down transmission oriented communication. At worst, it treats target audiences as dupes without awareness of their larger environments.

*Proctor [178] warned that the prescriptive and eliminative aspirations of public communication campaigns can have an unfortunate similarity to the same kinds of aspirations manifested in the public education goals of the Nazi regime. He called for reflexive examination of purpose particularly vis-a-vis how goals may marginalize and stigmatize in ways parallel to negative forces in society. He has also called for attention to how politics shapes the information that is the focus of communication campaigns relating to cancer [177].

*Myrick [161] noted how important it was that the HIV/AIDS campaign in Alabama targeted at African Americans be aware of the adversarial history that had been established in the past when Tuskegee stigmatized and targeted blacks with their syphilis experiments.

*Guttman [107] in an important review article discussed the ethical dilemmas faced by health campaigns and often ignored in campaign design and research. Issues she raised included: the ethics of

persuasion and coercion; the possibility of infringing on individual rights; the problem of targeting certain sub-populations as particularly needy and the resulting stigmatization of population sub-groups; the potential exploitation of family, community, and cultural groups as vehicles for implementing campaigns; the de-emphasis on a broader vision of social values.

*DeJong & Wallack [46] criticized the drug czar's antidrug media campaign for its lack of attention to societal infrastructures (e.g. treatment programs) that could support the campaign's objectives.

*Dervin and Frenette [72] challenged that campaigns and campaign research as must focus on campaign and compliance efforts by attending to issues of social power and ethics, how social class is often implicated in expert knowledge, how audiences are increasingly weary of being judged wanting, and how audiences are increasingly savvy about contradictions in the information marketplace.

*In noting that there is in actuality little agreement about what constitutes an information campaign effect, Salmon & Murray-Johnson [194] noted that the conceptualization of effectiveness has been more an accident of different researcher's rhetoric than coherently adopted conceptualizations. They offered a six category conceptualization as a potential organizing tool for research: definitional (getting a phenomenon defined as a social problem); ideological (implementing a definition of the problem as either individual and/or social); political (using the campaign to garner political support); contextual (assessing the match and interaction of selected mechanisms for change – engineering versus enforcement versus education); cost (campaign costs not only in terms of penetration, but in terms of savings to society and population); and, programmatic (the specific goals as defined for a given information campaign). Their categories clearly made room for a specific focus on societal forces.

*This trend is supported by an increase in campaign studies focusing not on understanding audience members but on understanding the societal mechanisms that promote particular behaviors. Alcohol use is a prime example where attention has turned in good part to eliminating sources of media messages that promote alcohol [31,32].

*Another example of a discourse analytic approach to studying health communication is Jones [124] who analyzed the way in which media, government, public, and celebrity each brought their own theories of self and communication to bear on the construction of AIDS celebrity in Hong Kong.

*Another example comes from Harrison & Cantor [114] focusing on understanding how media presentations of thinness contribute to eating disorders.

*Others calling for campaign research and design to include emphasis on social contexts, societal power structures, and ethics include: Lupton [142], Lyons & Rittner [143], Rakow [181], Walleck [239], Weiss & Tschirhart [242].

*One frequent criticism is that campaigns in attempting to avoid controversy leave behind reality as living people know it. One often cited example is the reference in HIV/AIDS campaigns to bodily fluids instead of tears, sweat, salvia, vaginal fluids, and so on [184].

*Singer [203] provides an interesting counterpoint to the above arguments in his book on the political economy of AIDS. He argues that AIDS policy is implicated in societal racism, classism, homophobia, and so on but notes that changing entrenched societal conditions is not an easier challenge than changing individual behavior. The point the above authors make, however, is that ignoring societal conditions introduces a communication gap between institution and intended audience.

2.6. Low impact

Given everything we know about what makes communication work more effectively it is not surprising therefore that in general attention to mass mediated campaign messages ranges from usually dismal to

moderate; and compliance with medical expertise is rarely higher than 50% and often as low as 1–2%. A general caveat is that public communication campaigns work at best modestly well and do so at great cost. In general, the larger the campaign budget the greater the exposure and the redundancy of exposure and the greater the impacts. Other factors relating to higher impacts include legal sanctions, and a chance intersection with some issue that has independently captured public concern.

*A host of authors have commented on the limits of campaign potential: for example, [20,101,161,184].

*Atkin [4] summarized the relatively modest effects from campaigns, noting that effects varied depending on the behavior change mandated, the receptivity of the audience, and the quality and quantity of messages.

*In the campaigns he reviewed, Snyder's [206] meta-analysis of campaign effects found exposure rates ranged from a low of 13% to a high of 99% with an average of 40%; and behavior change ranged from a low of 1% to a high of 41%; with an average of 7–10%. Impacts on behavior were higher when the behavior involved legal sanctions (17%); when introducing new behaviors (12%) rather than changing old ones (5%) or preventing behaviors deemed negative (6%).

*Exposure to campaign messages is a necessary condition for behavior change, of course, and most frequently described as a linear positive relationship. Kane, Gueye, Pacdquemargolis & Baron [125], for example, found the impact of a family planning campaign in Mali was directly related to intensity of exposure.

*Occasionally a campaign has large impacts and usually this means the public had a readiness already established by other means. A recent example outside the health communication terrain illustrates the point: Givens [104] reported on the public education campaign on caller id mandated by the state of California. The essential design of the campaign was mandated by Dervin [52] in her evaluation of the initially proposed public education campaign which she deemed seriously inadequate. Dervin concluded that because of increases in privacy intrusions resulting from advances in telelecommunications technology, the public was already alert to privacy issues. When a campaign was built around the slogan "your phone, your privacy, your choice), in a 3-month period penetration rates were an exceptionally high: 74% general awareness; 69% knowledge of how to prevent exposure of phone numbers; and 50% planning to chose maximum security protection.

2.7. Ricochet effect

A phenomenon that is not uncommon in public communication campaigns is the ricochet effect where the campaign produces effects opposite to those intended.

*Hafstad & Aaro [109] in their study of a mass-mediated ant-smoking campaign campaign targeted at adolescents found that a relatively high proportion of smokers decided not to quit as a reaction to the campaign.

*Herrmann & McWhirter [116] in their review of efforts to impact young people's smoking, substance abuse, and sexual activity found that some interventions inspired the very behavior they were designed to prevent, and others inspired refusal and resistance not to the targeted negative behavior but to the desired campaign effect.

*McGuire [149] in reviewing the campaign literature specifically emphasized the ricochet effect as being possible depending on the particular confluence of mediating factors along any step in what he described as the multi-step campaign influence chain.

2.8. Multi-step campaign models

The dominant response to the above within the compliance-gaining and campaign literature has been to develop complex predictive models incorporating measures of audience members' prior experience, beliefs, prior knowledge, attitudes, and a host of other factors. While this has increased predictive capacity, it's important impact has been to change how planners focus on message and campaign design – moving slowly, and sometimes reluctantly, from more institutional oriented frameworks to more receiver-oriented frameworks.

*McGuire [149,150] has provided some of the best overviews of this body of work presenting what he terms a communication persuasion matrix composed of groups of factors in multiple domains: source, message, channel, receiver, and target goal. He also conceptualizes the persuasion process in a series of steps: tuning in, attending, liking, comprehending, acquiring relevant skills, agreeing, storing in memory, retrieving from memory, deciding to act, acting, cognitive integrating, persuading others. He describes the process as a very complex multi-step chain which can easily ricochet to opposite impacts depending on the intersections of mediating factors.

2.9. More like us effect

In general, studies show that those most impacted by compliance-gaining messages and campaigns are more likely to be more like the very persons designing those campaigns in terms of demography, personality, and life style. Those "more like us" were also more likely to use sources, and channels, and evaluate source credibility as we do.

*Guttman, Boccher-Lattimore & Salmon [108] found in their survey that those more likely to be informed about AIDS and expert sources of AIDS information were the more educated. They also saw the experts as more credible.

*Rimal, Flora & Schooler [187] concluded that in general education was positively associated with most behavioral impacts from campaigns.

*Dervin [59,63,64] reviews literature documenting the ways in which audience members most impacted by campaigns are more like system designers demograhically and otherwise. She documents the same phenomena for LIS systems as well. She terms the research genre that focuses on "knowledge gaps" as a institutionally-inscribed view of the world. Those least like the experts are most likely to be ignorant of expert knowledge. The difficulty with this conceptualization, however, is that it ignores context and life conditions. Most health experts, for example, would be ignorant of most aspects of migrant worker life and survival, or of inner-city life and survival. In this context, the experts would be in "knowledge gap". Dervin concludes the knowledge gap hypothesis while useful in some social planning contexts must be applied cautiously and must be examined reflexively so as to avoid insofar as possible cultural and economically insensitive stigmatizations. Further, she emphasized that designing systems based on knowledge gap hypotheses is doomed to failure.

*O'Keefe, Boyd & Brown [165] found in a large midwestern survey of exposure to health information that their more educated respondents were more likely to learn from print media.

*Trotter and his colleagues showed beliefs about AIDS in four culturally diverse Latino communities were actually better predicted by education and income. The higher these indicators were the more likely respondent's beliefs were closer to biomedical beliefs [230]. This work is an example of a medical anthropology project [7] which has concluded that the important gaps in communication in health care settings are not between ethnic groups but between experts and lay people.

2.10. Information is not enough

A general caveat of the campaign approach to understanding information seeking is that information is usually necessary but rarely sufficient. Across studies, the stability of this finding seems to hold. It is, however, confounded by usual survey study emphasis on highly detailed attributes of medical knowledge – the kind that average citizens deem unnecessary to their own health-facing approaches except for when their situations warrant it. Hence, there is some counter-evidence that when people come to information in a state of readiness information may be enough. This issue is discussed below.

*Bakker [13] reviewed literature documenting that knowledge about AIDS was not sufficient to cause behavioral risk reduction. Other mediating variables accounted for the change. Among others making the same point: [149,150,187].

*Davis, Noel, Chan & Wing [44] showed that while their large sample of Hong Kong adolescents had a lot of misinformation about HIV/AIDS as judged by expert standards in fact few reported that they engaged in at-risk behaviors.

*Brendlinger, Dervin and Foreman-Wernet [20] found that while the health department wanted assessments of the knowledge levels of respondents on a battery of detailed HIV/AIDS facts (e.g. can a baby get the virus from a nursing mom? does it take only a few days to test positive? can you get infected by a mosquito? and so on), their Sense-Making survey respondents focused on these items only if their situational conditions warranted it.

*Myrick [161] in his review of HIV/AIDS prevention campaigns directed at rural African Americans concluded that while most campaigns do successfully disseminate information about the presence and danger of HIV/AIDS they rarely provided contextualized information relating to specific behaviors and to skills for modifying behaviors. Mryick saw this emphasis on behavioral efficacy as vitally important for campaigns targeted at ethnic minorities.

2.11. Novelty is needed

There is some evidence that the information that is presented even if it does not directly impact change does need to be "new" in some way. For some, this involves linking information with societal approved stimulators such as entertainment, and celebrity endorsement. For others, it involves simply a need for new information because old information has already been processed.

*Donohew, Lorch & Palmgren [90] tested message strategies based on presenting information in novel and sensation-arousing ways and found that in general they got significant impacts but there results were stronger for those with compatible cognitive needs.

*Petty & Cacioppo [173] presented evidence lending some support to the idea that in fact depending on the audience involvement with the message the kind of novelty used may or may not have impact. They described what they called a "peripheral route" focusing on supplementary cues such as celebrity endorsement and a "central" route focusing on cognitive engagement and decision-making.

*Snyder [206] in his meta-review of campaign studies noted that campaigns offering new information had higher behavior change impacts (14% compared to the 7–10% on average).

2.12. Treat people as if they are human

In general research agrees that recipients of health information are more receptive when they feel respected and are treated as capable and able agents rather than as recipients of behavioral modification

theory. The most general form of this understanding is manifested in a call to turn from transmission approaches to communication approaches, focusing on audiences as active and not passive, focusing on process and not outcomes. In effect, it is fair to say that this call has become a general rhetorical stance in campaign and information seeking literature. Even those implementing top-down transmission campaigns still talk about them communicatively. But, bottom line, the call to being communicative has slowly meant changes in either campaign design and/or how campaign and information behavior research is approached. This is more true for LIS research than for COMM research, although here I focus primarily on the latter.

*Clatts [38] challenged in his conclusions after 10 years of AIDS ethnography that "… AIDS prevention has become an exercise in behavioral modification theory, an enterprise that seems to me to have more to do with social control than with the prevention of a disease". (pp. 94–95)

*In a review of health campaigns in general, Rimal, Ratzan, Arntson & Freimuth [188] called for involving target audiences in genuine dialogue and in changing public policy.

*Ruben [192] did a content analysis of critical incidents in health care focusing on what patients remembered and concluded, as others have, that more than anything else patients want to feel listened to, respected, and cared for.

*Tones [228] offered a deep critique of the social marketing approach to drug use education, prevention, an policy.

*Myrick [161] called for attention to modeling campaign and health information efforts as involving mutual responsibility.

*A variety of other authors warn about using this or that technique to approximate dialogic communication when in fact the intent is to ensure compliance [107,166,184].

2.13. Adding communication interventions

The most common version of the implementation of this call to focus on campaigns communicatively has been to actually add communication interventions to campaign design in the form of interpersonal, group, family, and/or community activities. The underlying assumption here is that it is not possible to package messages in such a way to promote this kind of communicative impact from within the message itself. So, communication activities must become carrier. This change has consistently been shown to increase campaign impacts, improving exposure, awareness and behavioral change, but within limits and with the possible ricochet effects identified above.

*Rimal, Flora & Schooler [187] documented that exposure-induced information seeking and discussion accounted for four times more variance in health behavior change than exposure alone.

*Rimal, Ratzan, Arnston & Freimuth [188] in their review of campaigns concluded that the difference between the usually low impacts from campaigns and those that had gained moderate successes were due primarily to explicit interventions focused on increasing involvement.

*When Valois, Adams, and Kammerman [236] combined interpersonal communication (live phone-in support sessions) with mass communication (televised program) on smoking cessation, results showed a success rate on behavior change at the end of one year of 17% compared to 5–15% for previously televised only efforts.

*Dervin [52] in her review of campaigns emphasized the importance of adding interpersonal, family, community interventions as a substantial part of campaign design.

*As part of the Stanford Five-City Project, Rimal & Flora [186] emphasized the need to focus on families, as opposed to individuals, to change dietary behaviors. Their campaigns were more successful when they conceptualized both children and adults as potential sources of influence. In another report,

Rimal, Flora & Schooler [187] emphasized the importance of interpersonal communication in campaign impacts.

2.14. The cultural route to communication interventions

It became clear, however, that top-down imposed communicating activities had real limits. In short, simply adding communication interventions did not work unless they were sensitive to people's circumstances. The most common mode for introducing this sensitivity became identified as cultural/community involvement. Culture and community, in effect, became the package that it was assumed could carry within it all the sensitivities that campaign and information dissemination need to be effective.

*Myrick [161] "… administrators and educators must listen to exactly what community members say they need and then use this perspective to set agendas for outreach efforts, privileging the particular and varied needs of marginalized populations (p. 80). Myrick listed culturally sensitive communication strategies as focusing on community connectivities and social networks – family, neighbors, friends, community, civic organizations, and so on.

*Siegel & Raveis [200] evaluated HIV-related information for minority men as ineffective in the Latino community because it emphasized individual decision making while the cultural focuses on family decision making. Others documented the effectiveness of community involvements as vehicles for information campaign design: Rudd, Goldberg & Dietz [193] (focusing on nutrition and exercise with young African American females as target audience); Singer & Marxuach-Rodriquez [204] (focusing on Latino gay men and AIDS prevention; Sorensen, Hunt, Stoddard, Stein, Phillips, Baker, Combe, Hebert & Palombo [211] (focusing on dietary change for general population families using worksite and family interventions.

*Dervin [52] mandated for the design of the caller id education campaign in the state of California wide spread use of community-based teaching networks using the dialectics and cultural norms of each cultural community as natural vehicles.

2.15. Culture can not be a quick fix

The down side of the cultural route to encompassing human sensitivities in information dissemination and campaign design became quickly clear. One difficulty is that cultural and community groups sometimes stand in the way of changes individuals want to make. This has led in part to yet another route to improving campaigns – the efficacy route, described later below. Another difficulty with the cultural route to design is that when culture is treated as simply another tool for manipulation it is no more effective than straight top-down communication

*St. Lawrence, Jefferson, Banks, Cline, Alleyne and Brasfield [214] found that focusing on assisting adolescents in developing a variety of "self-efficacy" skills (e.g. using condoms, interpersonal negotiating, problem-solving, sexual assertion) was necessary to assist them in coping with their cultural environment and had an impact on decreasing risky sexual behaviors.

*Opie [166] warned against surface attempts to add a cultural turn in campaign design by thinking that involving patients, families, and significant others realigns power relationships. Changes in procedures, Opie cautioned, are not synonymous with effective cultural dialogue. Health communication must be dialogic rather than expert to be effective.

*Guttman [107] emphasized the difficulty of using community and cultural networks as campaign diffusion vehicles without genuine participatory involvement. The participatory communication literature [76] has long struggled with this difficulty.

2.16. When culture does not predict

Another difficulty with culture as a quick-fix is that it actually does not often predict information seeking and use well. In the rush toward attending to culture and community as vehicles for campaign design and information dissemination, we must distinguish between a general rhetorical/communicative strategy of using culture as a vehicle for carrying human sensibilities versus the more precise question of whether cultural identity is really doing the communicative work. Many studies have shown no relationship between cultural identity and health information seeking and use or campaign impacts. Others have shown differences and then determined they were accounted for by other more fundamental factors – income and education differences, for example; or geographic locale and impacts. Explicit tests of the strengths of demographic versus alternative predictors of information seeking and use have been a major focus of Sense-Making studies [to be reviewed later below] and have shown generally that cultural identity is rarely a significant predictor and when significant rarely as strong as other more contextually and situationally defined factors.

*Baer [7] found that his Mexican-American and Mexican migrant workers in Florida had perceptions of health – physical and mental – that differed from the biomedical model, but were somewhat similar to those held by a sample of white middle class.

*In a comparison of Hispanic origin Americans with middle-class Americans in terms of their perspectives on the common cold, Baer and his colleagues found very little difference. Although the cold was clearly differentiated from the "flu" which seemed to exist as an illness only among English-speaking US residents [10].

*Weller and colleagues [243] found four samples of diverse Latino communities shared similar beliefs regarding diabetes with these beliefs being congruent with those of the biomedical model. However, knowledge levels were predicted by education, greater acculturation, and coming from an area with higher diabetes prevalence.

*Trotter and colleagues came to the same conclusion in their study of beliefs about AIDS in four Latin communities In general, they said, Latino beliefs tended to converge with biomedical knowledge but beliefs were stronger and more detailed in higher prevalence areas [230].

*Weller & Baer [243] conducted interviews with 800 informants about causes, symptoms, and treatment for AIDS, diabetes, common cold, empacho, and mal de ojo. Results indicated a high degree of sharing across the populations with little unique variation due to regional or ethnic variation.

2.17. When culture does predict

Clearly, however, the community and cultural involvement approach to communication interventions has proved valuable. In the absence of any other theoretically guided approach to creating dialogic communication, attaching health information to the naturally built-in involvements of social networks is a long standing strategy by breaking out of top-down approaches. The difficulty comes in thinking this is the way to organize communication and information systems where seekers control navigation. As an example, it is true that certain groups of Mexican Americans diagnose themselves with folk illnesses.

Further, it is true that these self-diagnoses have been shown to have utility when attended to seriously from within biomedical frameworks. What doesn't hold, however, is the assumption that all Mexican Americans will use such folk diagnoses. The error in information system or message design is to assume that all persons in an externally identified cultural group will make sense in the same way. This is an especially grievous error in online systems which assume seeker navigation flexibilities yet often capture users in boxes that do not apply to them. Cultural identity, like other human identities, is temporally and spatially applied – it only sometimes applies to how people make sense of the world … and it is the audience member, not the source, that controls when and where.

*For a sample of geographically isolated Mexican farmworkers in Florida, 23% diagnosed themselves as having the Mexican folk illness "susto" as a result of pesticide exposure. Evidence suggested that this self diagnosis did relate to more severe symptoms [9].

*Interviews with biomedical healers regarding two Mexican folk illnesses (susto and mal-de-ojo) resulted in the vast majority of the symptoms being judged as worthy of medical attention and possibly life threatening [8].

*Dervin and colleagues have specifically interrogated the issue of when and under what conditions demographic factors such as racial identity, ethnic group, age, gender and so on predict information seeking and use. These studies are reviewed below [48].

2.18. Involvement by any other name – the cognitive approach

In general, the conclusion one must come to is that the biggest breakthrough in understanding health information seeking in the campaign/compliance is the generalization that what predicts attention and response best is readiness. Readiness is something members of the audience bring to the information. Obviously, from a campaign or compliance perspective, if involvement predicts success then it ought to be useful to find ways to create involvement. The use of a variety of cultural and community communication interventions described above is one such approach, one without specificity because it simply hopes to carry with it relevant audience sensibilities. Two more precise routes have emerged. One focuses on the idea of matching message design to the cognitive orientation of the audience member.

*Dervin [58,63] and Dervin and Frenette [72] have reviewed work that shows that cognitive involvement is a more fundamental and explanatory predictor of health information seeking than the traditionally emphasized focus on enduring characteristics of source, message, channel, and receiver.

*Baggaley, Salmon, Siska, Hardy-Lewis, Tambe, Jorgensen, Harris & Jason [11] has 100 African American participants evaluate HIV/AIDS related public service announcements. In general, those who saw themselves as more at risk evaluated the announcements more positively.

*The medical anthropology studies reviewed above found that living in geographic areas with higher incidents of diabetes and AIDS differed in their knowledge levels and beliefs about these diseases from those living in geographic areas with lower prevalence [230].

*Petty & Cacioppo [173] in their critique of marketing aproaches to changing what they called "disturbing and disturbed" consumer behavior, called for a cognitive involvement approach in order to link what people know with what they feel.

*Flora & Maibach [99] found in their study of AIDS prevention to adolescents and college students that emotional messages were best remembered by those who were less involved while both rational and emotional messages were equally remembered by those who were highly involved.

*Millar & Millar [154] found in their experimental study high anxiety message processors focused more on messages about health promotion while low anxiety message processors focused more on messages about disease detection.

2.19. Involvement by any other name – the efficacy approach

The second more precise route to engendering audience involvement focuses on empowerment and skill building. The essential idea is to provide audience members with more than scientific expertise, but also with the information and skills they need for implementation in their own life contexts. This approach has shown the greatest gains for yielding greater success in campaign and information dissemination goals.

*Rimal, Flora & Schooler [187] emphasized that while message exposure leads to knowledge gain, it is involvement and activity of some kind (information seeking, interpersonal communication, community activity, self-efficacy work, skill building) that leads to behavioral impacts. They build their approach on McGuire's [149,150] multi-stage model.

*Eldridge, St. Lawrence, Little, Shelby, Brasfield, Service and Sly [93] compared an educational to a skills training approach in an HIV/AIDS reduction intervention for women undergoing inpatient substance abuse treatment. They found the skills training approach most effective.

*Harrington [112] in work on college students' resistance to alcohol focused on teaching a broad repertoire of interpersonal skills and resistance strategies and found doing so supported resistance outcomes.

*Kearney [126] found in her review of ten qualitative studies of women's addiction and recovery that women responded well to emphasis on self-nurturing and connecting to others. They concluded: "Abstinence appears to be only the top of the iceberg, and self-work and connection work are essential components of lasting sobriety". (p. 511)

*Wald, Harvey & Hibbard [237] reached a similar conclusion in their call for focusing on empowerment and learning coupled with action in programs directed at women substance abuses.

*Austin & Johnson [6] focused on media literacy training as an intervention to assist children in their decision making about alcohol.

*Dervin, Harpring and Foreman-Wernet [74] based on their study of pregnant, drug addicted women called for a 3-pronged emphasis in interventions focusing on empowerment combined with nurturing and dialogue.

*Others calling for an emphasis on self-efficacy and skills building included, for example: Myrick [161]; Ratzan, Payne & Massett [184]; Rimal, Flora & Schooler [187]; Rimal, Ratzan, Arntson & Freimuth [188]; St. Lawrence, Jefferson, Banks, Cline, Alleyne & Brasfield [214]; Witte [251]. Some of these authors warn, however, that this much be approached as two-way communication and not as top-down one way communication obsessively focused on compliance.

2.20. The golden mean effect

An interesting aside to the above set of propositions is the glimmer of understanding that emerges regarding readiness to attend to messages. In general, there is a "golden mean" effect – moderate levels of any communication variable are more likely to be more persuasive.

*McGuire [149] talks of the "golden mean" effect in his review of input and output variables seen as currently promising for constructing persuasive messages. His point is that all other things being equal in

the highly complex and sometimes elusive campaigns process "… a moderate level of any communication variable usually has more persuasive impact than very higher or very low levels". (p. 41)

2.21. Razzle-dazzle only for the disinterested

Underlying the "golden mean" effect may be a related effect which ties back to involvement. Yet another group of findings suggests that in general those who are more involved (by whatever measure) are not only more likely to attend to campaign messages, they are less likely to need extreme or glitzy design features to get that response. Bottom line, when folks care about the topic they do not need to be enticed to the message. In effect, the "golden mean" effect may be an artifact of the top-down character of most health information dissemination efforts. In contrasts, the gain in impacts from creating avenues for involvement may comes from something fundamental in human information seeking and use. It is at this particular juncture that the COMM field literature and the LIS literature seem to have a possible place where they could inform each other.

*Petty & Cacioppo [173] identified two roads to campaign processes – what they termed the peripheral route with emphasis on celebrity endorsements and such; and the central route with emphasis on critical thinking and decision making.

*Bakker [13] found that in a study of the effectiveness of a cartoon versus a written message about HIV prevention that those with a low need for cognition were more impacted by the cartoon.

*Dervin [64] summarized literature showing that when people are in information-seeking readiness not only do they grab possible answers to their questions from wherever they run into possibilities, but they often do so beyond their presumable skill and literacy limits.

*Flora & Maibach [99] tested three public service announcements relating to HIV/AIDS on college students and found that emotional messages were remembered better than rational messages by those with low involvement. Both message types were remembered by those with high involvement.

*Frenette [102] in her work applying Sense-Making Methodology to the design of campaign public service messages emphasized that it is not sufficient for messages to be notorious or aesthetically pleasing. Rather, they must be as meaningful as possible to the life conditions of audience members.

*Hafstad & Aaro [109] summarized research that shows that stronger emotional appeals are needed for audiences whose interest is low.

3. On information seeking and use in context: the library and information science literature

3.1. Elusive information

For the most part, citizens know that information is often tied to vested interests; that what is considered proper knowledge by one source will be discredited by another; and what is considered proper knowledge today can be discredited tomorrow. Citizens are increasingly savvy about the information environment within which they live. They know they are rarely presented with the full picture or all options. They understand that medical research is often oriented to profits for sponsors.

*Casswell [32] emphasized the difficulty for interventions of the conflicting voices in society vis-a-vis alcohol.

*Introna [123] in her call for taking a hermeneutical perspective on the study of information seeking emphasized the intricate interweaving of information, context, power, and meaning and the ways in which information seeking and use processes are intimately tied with outcomes.

*Dervin [48] has documented in her studies how under high trust interviewing conditions informants readily discuss their concerns about conflicting information they receive from professionals and their evaluations of the vested interests at work in the transmission of "expert" information.

*Cardillo [25] in an in-depth study of one adolescent dealing with chronic illness showed that in the context of talking about her lived experiences her informant naturally attended to issues of power, control, independence, and the right to make sense of her own terms.

*In a remarkable book, Cronin and Davenport [42] documented how most academic rhetoric about information in an electronic age belies the realities of what is happening. They termed the common view naive with its emphasis on information professionals, information transmission, and national information policy. Their analysis illustrates that the world of information which was once contoured by the ethical and bibliographic standards of library science is now shaped by aggressively expansionist activities of an elite of major players for whom information is commodity.

3.2. The undiscussable

For the most part, citizens also understabd that there are marked limits to being able to discuss differences in expert answers to the same question out in the open. This is often named as a major sense-making barrier. Dervin [54] attributes this difficulty not to mal-intent but rather to the ways in which a focus on objective information transmission dominates society's information systems. While most sources will acknowledge privately that there are different answers to questions, public discourse and its supporting economic and legal systems, demands not dialogue but assertion.

*Dervin (unpublished interviews) has collected some 500-plus in-depth interviews in which patients facing life situations in which they saw themselves as "suffering" readily discuss how they were unable to find supportive arenas in which they could discuss competing information claims.

*Dervin and colleagues in their 1982 study of cancer information seeking by cancer patients documented that the questions patients considered most important were more likely to be the same questions they saw themselves as getting the least help struggling with [79].

*In a series of review articles, Dervin [59,60,64] documented this phenomenon concluding that experts and information systems routinely avoid information terrains which are controversial or conflicted or which involve what experts consider to be the more "subjective" – the very aspects of information seeking which lay people focus on the most.

3.3. Information seeking complexities

Research results emerging from qualitatively informed approaches document the process of information seeking and use as extraordinarily complex and very changeable across time, far more so than has ever been imagined in most traditional studies. When information seeking and use is examined in-depth, phenomenologically, and without a priori assumptions about what is good information seeking and use, what emerges is a portrait of complex situated information processing. If one juxtaposes this conclusion with the primary conclusions from the COMM literature above, in fact the two do not disagree. Both converge on the need to focus in more complex ways than has traditionally been the mandate and in ways that attend to the world as seen by information seekers.

*Limberg [139] in her review of information seeking studies emphasized that information seeking is not well described with system-imposed linear models. Algon (1997) concurred.

*Solomon [208] described the information seeking process as a movement through "information moisaics" – different seekers even in what appear to outside observers as the same situations show differing strategies and patterns.

*Sonnewald [209] and Sonnewald, Wildemuth & Harmon [210] focused on developing what they called "horizon maps" for studying the complexities of information seeking. They emphasized that the information horizon as seen by the seeker is as likely to be elusive and meandering as well-defined.

*Baker [12] found in her Sense-Making study of information seeking by MS patients during situations of acute exacerbation that information seeking changed as patients moved through their situations.

*Tom [227] concluded that there is an accidental and saggacious aspect to everyday information seeking and use, just as has been documented for scientific information seeking.

*Harmon & Ballesteros [111] called for focusing in information seeking studies on the fuzzy, emotional, complex, and non-linear.

*Wang [240] emphasized that the process by which seekers move from asking to searching to finding to evaluating is complex, varied, and difficult to predict.

*Cardillo [25] did an in-depth study of one adolescent dealing with chronic illness and found her informant's information seeking and use changed markedly as she moved across time.

3.4. Information seeking between order and chaos

Study after study has shown the need for breaking outside systems maps of the world when studying information seeking and use. Information seeking when studied within system constraints can only be described as fitting those constraints. When studied outside those constraint, all sorts of patterns emerge that could not otherwise be seen and would be otherwise attributable to error.

*Ross [191] documents that information seekers find helpful information in unlikely places. In her study of novel reading, for example, she documented that readers describe themselves as gaining a variety of helps from novels: new perspectives, enlarging possibilities, identifying models, finding comfort, connecting to others, getting motivation to change, feeling accepted, and so on.

*Dervin and colleagues showed in their study of everyday information seeking and use that for seekers information is a means not an end. People grab answers when and where they can, often not remembering where [87].

*Erdelez [95] emphasized and documented the idea of information encountering – that much information finding is accidental.

*Wilson, Ford, Ellis, Foster & Spink [248] called for focusing on uncertainty as a primary construct for studying information seeking and use, and looking at its role in personal orientations, in information, in situations, and in process.

*In reviewing LIS work focusing on relevance – whether a seeker judges a particular piece of information as relevant or not, Spink [212] restated the now firm generalization that relevance can no longer be seen as an attribute of information or message or system – i.e. the judgment that this information is the right bit for that problem. Rather relevance judgments are a complex intermingling of seeker judgments emotional, cognitive, and situational. Spink, in particular, emphasizes the importance of time on these judgments.

3.5. New approach to research

Breaking outside the traditional confines of the information system required a new of thinking about information seeking and use research. It meant, in effect, finding a way to study the complexities of the information environment and the information seeking process on the seeker's terms. This led LIS researchers to turn toward more qualitative, rhetorical, hermeneutic, and interpretive approaches to studying information seeking and use. It also led to more emphasis on process approaches.

*A host of researchers in LIS have called for a discursive turn in information seeking and use studies in order to focus on the complexity of information seeking and how it is part and parcel of life-facing. The Dervin and Nilan [78] state-of-the-art-review marked the first call, but the call has been echoed many times since [119,120,235,247].

3.6. A call for a new kind of social science

It is important to note that this call in LIS reflects a general turn in the applied social science. While the call for research innovation hit LIS in the late 1980s, the same call in now emerging from the bastion of social science research – survey research and public opinion polling. It is not surprising, therefore, that leaders in survey research for the first time in decades are challenging the conventional wisdoms about survey research; calling for more open-ended and in-depth approaches; and testing alternative approaches which often evaluate as producing superior results. Likewise, we see the same call emerging in the COMM lit focusing on campaigns where traditionally an interest in more qualitative approaches has been marginalized as exploratory research or as something researchers not interested in practice and policy do.

*Donsbach [91] summarized the state of survey research at the end of the 20th century and concluded that while polls are generally seen as valid and precise ways for measuring what the public thinks, in actuality they often produce misleading, invalid, and or irrelevant data on social and political processes.

*Survey research expert Krosnick [132] challenged that the traditional assumption that high response rates support representative sampling has not been born out. Recent evidence, he said, shows that more conversational interviewing can significantly improve data. His work has shown that open-ended questions can have both greater reliability and validity.

*Yankelovich [254] in his acceptance speech for a public opinion research award, said: "Far from giving leaders insight into the real concerns of the public, polls often add to the disconnect that separates the leadership class in the United States from the mainstream of the citizenry". (p. 2)

*Baer [7] came to the same conclusion in his assessment of the National Center for Health Statistics attempts to survey migrant Mexican Americans regarding health. His review concluded that the gap was not between ethnically different citizens but between lay citizens and professionals.

*Brendlinger, Dervin, & Foreman-Wernet [20] found in their comparison of HIV/AIDS related impacts resulting from a public communication campaign that the map of the world obtained from a Sense-Making study differed greatly from that obtained from a traditional close-ended survey. Only 31% of the Sense-Making respondents mentioned one or more of the knowledge items on the health department survey; only 25% mentioned one or more of the same behavioral impacts; only 18% mentioned one or more of the same attitudinal items. They concluded that the health department survey focused on details irrelevant to everyday experience while the Sense-Making narratives focused on big issues.

*Dervin and co-authors in a series of studies having used qualitative interviewing even in large sample phone surveys and have found respondents willing to talk for periods averaging 25–35 min. Further, these

studies have increased statistical capacity to explain variance in information seeking and use criterion variables anywhere from 5% to 20% [49].

*Talking from the qualitative critique of quantitative research, Cheek [35] called for researching health care using what she called "post-modern" approaches. Mohr [157] called for the use of Denzin's interpretive interactionism as an approach to intervention and outcomes research.

*Other have called for method triangulation using both qualitative and quantitative approaches to compliment each other [118,161,190].

3.7. A new kind of explanation – context as foundational construct

While traditional source oriented work reduced the portrait of users to a complex of demographic, personality, and life style variables, the emerging interpretive work calls for focusing on person-in-context. What is meant by context differs across studies. At one end context is conceptually similar to the call for focusing on involvement in the COMM lit. It calls for attention to how the information seeker is involved in message content culturally, cognitively, or emotionally. It is at this juncture that the COMM and LIS literatures meet. What differs is that the LIS has expanded to a host of more situated, more experientially based ways of conceptualizing context. While the COMM literature conceptualizes a general need for a focus on involvement and practice, the LIS literature has been calling for specified theories of contextualized information seeking and use. Further, LIS has produced a somewhat bewildering array of these alternative theories with accompanying research. The array is so large and unaligned that it is impossible to draw a detailed portrait based on findings. There are some general trends, however. One is that the entire body of work is moving toward examining the specific ways in which characteristics people bring to system interact with system characteristics. The second is a move to more and more situated models of information seeking., essentially a focus on person-in-context. The third is a necessary series of arguments between this or that way of defining context, situation, and information seeking. The fourth is that moving toward more situated models of information seeking has introduced extraordinary gains in research on information behaviors. The fifth is the exciting presence of methodological challenges and developments as the work advances across years.

*The force and strengths of the call in LIS toward work focusing on person-in-context is documented by the now institutionalized Information Seeking in Context conferences [119,120,235,247].

*Chang and Lee [33] documented the diversity of definitions of context in LIS noting some prominent emphases on: access, cognition, outcomes, problems, resources, environmental assessments, rules, roles, setting, situation, and task.

*Dervin [51] presented a background paper focusing on "given a context by another other name" pointed to how context is most usefully understood phenomenologically and interpretively.

3.8. Getting more and more situated

It is important to note that LIS struggles as COMM does with observer versus actor views of information seeking. A significant number of LIS researchers still call for observer definitions of context. Prominent examples of these include knowledge domain and task domain. A knowledge domain in LIS is essentially a field of knowledge – e.g. medical oncology. A task domain is related, referring to the professional field in which the seeker sets to tasks – e.g. cancer treatment, radiation therapy, accounting, architecture. Dervin calls these "noun" domains because they organize the world in the boxes agreed upon within expert systems. In general, results show that domain is a necessary structural attribute of information design

but not the best predictor of what people do (cognitively, emotionally, or behaviorally) when using an information system. In light of this evidence, LIS studies have moved to a variety of conceptualizations which are more relevant to how information seekers go about seeking and using information in specific situational moments. A variety of models have been developed all of which have shown promise both for predicting and explaining information behavior and for information system design. The typical model seeks to link different kinds of information seeking situations with different information seeking strategies, sources, and desired outcomes. In general, the model follows that proposed by Dervin's [56] Sense-Making metaphor with its emphasis (in this context) on a person in a situation, facing a gap, building a bridge over the gap using different sense-making strategies, and then assessing the outcome and moving on to the next information-seeking moment. What is important to all these models is their emphasis on how information seeking and use changes temporally. Most of these models, even those that still bring to bear across-situational characteristics of seekers (e.g. cognitive style) or seeking context (e.g. domain), include some conceptualization of temporal change within a given information seeking context.

*Wilson, Ford, Ellis, Foster & Spink [248] examined uncertainty in information seeking and use as predicted by problem solving stages (problem identification, problem definition, problem resolution, and solution presentation.

*Allen & Kim [1] examined the interaction of what they called person variables (cognitive styles and abilities) with context variables (information seeking tasks such as fact searching versus topic searching).

*Chang & Lee [33] examining information seeking and use situationally and identified five different information behavior typologies: seeking, uncertainty-reducing, learning, value-adding, and disseminating. Each typology had its own associated array of intentions, activities, information sources, and focal information objects.

*Kuhlthau [134] has developed a six-stage task completion typology showing that information sought and searching varies accordingly. The stages included: initiation, selection, exploration, formulation, collection, and presentation. Numerous others have confirmed the finding using either Kuhlthau's model or related approaches (e.g., [23,234]).

*Anderson [2] showed how deep ethnographic work allowed her to connect contextual and temporal factors involved in information seeking with seeker evaluations of the relevance to them of information found.

*Vakkari [232] modeled the intersection of task complexity, degree of problem structure, and seeker's prior knowledge on information actions (needs, uses, sources, strategies, relevance judgments).

*Dervin and colleagues have completed a series of studies in which situation movement state (how a seeker sees self as stopped at a given moment in time) is used to predict both qualitative and quantitative information seeking (question asking), source using, and outcome evaluating. These are summarized in: [48,56,61]. Across studies, there is an identifiable pattern of relationships such that how the seeker sees oneself as facing gaps predicts every aspect of information seeking activity.

*Frenette [102] in her applications of Dervin's Sense-Making Methodology to research designed to information public communication campaign design concluded in her study of adolescents and smoking that by focusing on a 'time-line' of adolescent attentions in interviewing one could obtain more useful design-relevant data. She analyzed her teen narratives in terms of where they showed the teens were coming from, what they were struggling with, and where they were going.

*Dervin and Clark (in preparation) demonstrated that even the criteria with which seekers evaluate the "goodness" of answers to questions varies depending on how the seekers self themselves as situated. In health situations, those respondents who saw the answer they obtained as not useful or "bad" focused on attributes of source and self (e.g. credibility, accuracy, motivation, manner) or problem (e.g. complex) or

information (e.g. contested) while those who saw the answer they obtained as useful or "good" focused entirely on how the answer helped them move through time-space.

3.9. A more holistic view of what is involved

An important characteristic of the LIS work is its reach for a more holistic view of information seeking and use. It is not unusual for the work to include variables which explicitly attend to the emotional giving it equal footing with the cognitive and informational; or for work to attend explicitly to times when the information system is seen as a barrier to information seeking and use. A few examples follow.

*Dervin and colleagues have developed situational typologies that incorporate various kinds of worry, defined in terms of how movement is stopped. Examples include: spin-out (having no road); wash-out (having a road which suddenly disappears). In addition, this work has yielded a set of categories assessing how information helps and hinders which include such categories as: found picture, created idea, found direction, got support, eased anxiety, and so on. These studies are summarized in [48,56,61].

*Dervin's Sense-Making Methodology also explicitly attends to emotional, physical, and spiritual feelings as ways of gap-bridging along with ideas [48].

*Kuhlthau [134] used her search stages as predictors of seeker feelings identifying each stage with its particular complex of emotions: uncertain-certain, pessimistic-optimistic, confused-clear, frustrated-relieved, doubtful-confident, dissatisfied-satisfied, disappointed-pleased.

*Dervin's Sense-Making studies have examined barriers to information seeking from its beginning [87]. Given the way in which the methodology does not constraint looking at information systems in any particular way, informants freely discuss how information systems themselves are a frequent barrier.

3.10. The verbings of information seeking

One of the most telling characteristics of the LIS work on information seeking and use is its move to what Dervin has termed "verbing" categories [49,55]. The point is to break information seeking down into moments of activity because that is, despite surface appearances, where the information seeking and using is happening. One can readily see how the attention to person-in-context described above moves in this direction This attention to verbs is widely considered as manifesting a first genuine move toward process orientations. A review of the verbing typologies and category schemes shows both their variety and how they begin to cohere in theoretic and predictive potential. For Dervin, this involves a search for process universals, a new way of theorizing communicative activity. Instead of predicting solely or even primarily based on nouns (across time-space ascribed characteristics of source, institution, information, and seeker), the focus moves to verbs, moments of defining, seeking, evaluating, and so on.

*Nilan & Dervin [164] conceptualized the question-asking of their respondents into six verbs: defining, doing, connecting, removing, projecting, and motivating. They drew these categories from a factor analytic examination of questions asked.

*Kuhlthau [133] identified a of time-space information seeking verbs which predict differences in information seeking and use: acting, reflecting, feeling, formulating, predicting, choosing, interpreting, creating.

*Limberg [139] called for attention to how seekers approach searching in given situations comparing, for example, surface seeking and deep seeking. Limberg also emphasized that how searchers seek depends not on the information content but on how the searcher sees the information content.

*Davenport, Higgins & Somerville [43] called for looking not at information needs but at situated actions pinpointing among others: e.g. keeping up to date, browsing, and habitual accessing.

*Chang and Lee [33] mentioned: seeking, uncertainty-reducing, learning, value-adding, disseminating.

*Cheuk and Dervin [36] coded sense-making incidents in recent on-the-job problem solving situations as: task-initiating, focus-forming, idea-assuming, idea-rejecting, idea-confirming, idea-finalizing, idea-sharing, approval-seeking, approval-granting, and design-generating. This work drew heavily on Kulhthau.

*Schaefer [198] drawing on past working in Sense-Making codified online posting moments in 10 verb categories: sharing insights and pleasure, praising others, seeing connections, sharing struggles, relating similar experiences, asking questions, seeing contests, connecting with others, seeing causes, needing support.

*A number of Sense-Making studies [48,56] have focused on their version of outcome measures – how sense-makers see themselves helped as they move through time-space. The various category schemes are all based on the same conceptual source [61]. As one example, Dervin and Fraser [70] tapped how library users saw their most recent visits to libraries as helping in these categories: got ideas or understandings; planned and decided what, when, where; felt good about self; got skills; made contact with people; accomplished or finished something; got started or motivated; got happiness or pleasure; kept going when it seemed hard; got out of or avoided a bad situation; rested or relaxed; took mind off things; calmed down or eased worries; felt not alone; felt reassured or helpful; got confirmation. These were combined conceptually into seven major help categories: got ideas/understandings; found directions, got skills; made contact with others; got support, emotional control; felt connected, not alone; got rest, relaxation; got happiness, pleasure.

*Mention must be made as well that McGuire [149] in his review of the COMM campaign literature also used a verbing typology to describe the steps in the campaign persuasion process as documented by prior research: tuning in, attending, liking, comprehending, acquiring relevant skills, agreeing, storing in memory, retrieving from memory, deciding to act, acting, cognitive integrating, persuading others. While no other such verbing typologies were found in the COMM campaign work, this use is a conspicuous and potentially fruitful link between the two literatures.

3.11. Methodological reflection and innovation

Another important characteristic of the LIS work is its emphasis on methodological reflection and innovation, something which, alas, is absent from the COMM work. These innovations range from developing new methodological approaches for studying information seeking and use, to developing methodological mandates for research, to innovating use of units of analysis smaller than the person.

Sonenwald, Wildemuth & Harmon [210] compared the advantages and disadvantages of using different methods to study information seeking and use and then proposed a methodology for mapping information seeker "horizons maps" in specific situations and analyzing them with variants of network and content analysis.

*Limberg [138] proposed an approach termed "phenomenography" and compared its potential utilities to other approaches.

*Erdelez [95], Erdelez & Rioux [96] focused on accidental discovery of information. Toms [227] focused on browsing as a mode of information seeking. Ross [191] focused on finding without seeking – getting information help from fiction reading. Harmon & Ballasteros [111] focused on deeply embedded information needs, what they called "unconscious cognition". Each of these suggests a mandate to examine information seeking and use outside the context of the information system.

*Dervin has from the beginning of her development of Sense-Making mandated attention to information and seeking use before, during, and after system contact as the only means of getting a realistic picture of how a system might serve users well. She has emphasized that to examine information seeking and use only within system confines has two deleterious effects. One is to develop a portrait of seeker literacies that was driven by system biases, and prejudices, witting or unwitting. The second is to provide answers which do not help system design because they can not address what a system might do [48,73].

*A number of the LIS studies attend to units of analysis smaller than the person because the emphasis on the moment of seeking action mandates it. Some studies have done this qualitatively (e.g. [2]); others have done so quantitatively arguing for the relevance of the micro-moment of seeking as an appropriate unit (e.g. [36,73]). One study [164] compared a given person's information seeking across eight different situations partitioning statistical variance into person and situation as predictors of information seeking and use. Results confirmed the utility of using a unit smaller than the person.

3.12. What predicts best

Given the emphases above, an important aspect of some of the LIS work has been to focus on what predicts best. Results show that in general more situated measures predict information seeking and use best.

*Dervin, Nilan & Jacobson [80] compared three classes of predictors of how information seekers in blood donating situations saw themselves helped by information – across time-space (demography); a priori time-space (involvement, orientation); and time-space bound (situation movement state, and nature of gap faced). Variance accounted for on average was 1.7, 1.6, and 17.4% respectively.

*Cheuk & Dervin [36] showed qualitatively how the information seeking patterns of auditors, engineers, and architects reflected not their professional differences but how they saw themselves making sense at particular moments in problem-solving situations. Data not yet published confirms the portrait statistically.

*Nilan & Dervin [164] compared a situational measure (how respondents saw themselves stopped) to two measures of communication context – relative status between participants, and perceived openness of communication – as predictors of question-asking. The situational predictor explained 5.7% of total variance on average compared to an average of 1.6% for the other two predictors combined.

*In a study of everyday information needs and seeking, [5] compared race (African American, Caucasian, and Hispanic American) versus situation movement state (how respondents saw their movement in everyday troublesome situations as stopped) as predictors of question-asking. Situation was significant, race was not. Even when predicting the sources from which respondents sought answers to their questions, race alone did not predict significantly – rather it was a race × situation interaction. This study was drawn from the data base of the 1979 statewide study of Californian's information needs [168].

*In a study of how their most recent visits to the library helped a statewide sample of Californians, Dervin and Fraser [70] found that on average the percentage of variance accounted for in help designations was: 0.4% by kind of library visited; 0.4% by recency of library use; 4.6% by demography; 7.3% by the kinds of materials borrowed; and 7.9% by the nature of the situation which led to the information seeking.

*In a study of the information seeking of cancer patients, Dervin, compared kind of treatment (chemotherapy versus radiation therapy) to point in the disease process (before diagnosis, diagnosis, treatment planning, during treatment, between treatments, after treatment)) and found the latter was a consistently significant predictor while the former was not: 60% of the analyses were significant for the disease process predictor compared to 0% of the analyses for treatment as a predictor. This analysis focused on kinds of questions asked coded not in terms of the specific nouns in the questions but rather

in terms of the gap pointed to by the question. For example, the question "Will chemotherapy/radiation therapy affect my life negatively?" was coded as questions about the future, focusing on possible bad roads, and nature of treatment effects [77].

*In their study of TV viewers, Dworkin, Foreman-Wernet & Dervin [92] pitted five traditional predictors of media information seeking and use (social class, education, frequency of viewing, source credibility ratings, and cognitive intensity) against a situated measure of involvement vis-a-vis a particular TV news story – whether the viewer empathized with the establishment or the victim in a news story). The criterion measure was whether viewers indicated in their Sense-Making interview that they argued with the news coverage. The situational measure was the only significant main effect both before and after controls for the other variables. There was a counter intuitive near significant interaction between social class and the situational measure such that managerial class viewers who empathized with news story victims were more likely to argue with the story than working class viewers. Dworkin et a. concluded the reason for this was environmental – the empathizing managerial class viewers had less ready environmental support and hence more cognitive work to do.

3.13. The Caesar effect – what predicts best when

However, given the inherently contextual and situational thrust of LIS research on information seeking and research, the prediction question is most usefully restated as "under what conditions does what predict best? or even more appropriately, what do people need and want from an information system under what conditions [51,220]. Only one study was found that focused here specifically – in the context of predicting user perceptions and actions regarding telephone privacy [83]. Theoretically, Dervin has predicted (1999) what she calls the "caesar effect" – the idea that predictors can predict only that over which they have power. Income, for example, is conceptualized as an across time-space attribute of persons. It's power buying power which should impact the individual's freedom to, for example, purchase privacy protecting remedies. Income should also predict the extent to which individuals are intruded upon by telemarketers and, hence, individual perceptions of the extent to which their privacy has been violated. On the other hand, income does not have power to control how the individual reacts to these intrusions, or to the ways in which privacy protection might itself be a barrier. The results from the one available study show the potential power of this framework. They also show that the three categories of predictors Dervin & Shields used – trans-situation (across time-space), contextual (a general orientation to phone use) , and situational (time-space bound events) – all had a viable predictive role.

*In their study of the perceptions and actions of Ohio general population adults vis-a-vis telecommunications privacy, Dervin & Shields [83] compared transituational predictors (demography) with contextual predictors (measures of telephone salience) to situational predicts (how users saw the phone as helping in real life situations). Results showed the caesar effect. Demography and functions both predicted whether respondents felt their privacy had been violated by phone (7.6% variance accounted for and 7.1% respectively compared to 4.1% for salience measures). In contrast, whether respondents did something – a behavioral action requiring economic resources such as purchasing an answering machine, or caller id) was best predicted by demography (7.6%) and salience (6.7%) but not functions. Whether the actions taken hindered, on the other hand, was best predicted by context and functions (7.8% and 6.3%) with demography accounting for a lesser 5.3%. The tests here were very stringent – all testing predictive power after variance accounted for by all other predictors had been removed.

*Dervin [48] emphasizes the important of looking both at human flexibility across time-space (chance, capriciousness, or planned changed) as well as human inflexibility (habit, stability, inertia) and to conceptualize and understand the difference.

3.14. The human factor

It deserves mention before concluding this section on LIS studies of information seeking and use that throughout the LIS studies described above, one finds the same emphasis by seekers on the human factor in information service provision. LIS's information seekers focus as much on providers being friendly, human, and supportive as COMM's target audiences of health messages.

*Harris & Dewdney [113] found that service providers who offered information and help in what users saw as a friend, supportive, and family-like way were judged more helpful.

*Dervin, Harpring & Foreman-Wernet [74] found in in-depth Sense-Making interviews with 10 drug-addicted, pregnant mothers that the women wanted to be listened to and supported in the context of their material lives. The informant narratives gave overt guidance to caretakers with an interest in providing assistance rather than further stigmatization.

*Dervin and Fraser [70] in their statewide California study of how libraries help found that 93% of their general population respondents said they got support and emotional control, higher than the 89% who said "found directions, got skills, reached goal" and the 83% who said "got ideas/understandings".

3.15. Responsive systems and professional burn-out

Despite this difference, both the COMM and LIS literatures end up concluding that it is not the expert who is in charge of the intersections between systems and people, but rather the audience members, patrons, patients, seekers, users, and so on. An accompanying corollary to this is the tension between the reality of recipient needs and system communicative potential. On the one hand, recipients of information have only one way to approach the information – on their own terms, in their own frameworks. On the other, information/communication systems as we know them are structured in terms of bureaucratic arrangements and expert knowledge domains. It is a bad match. In all systems, the human intermediaries bear the burden – health professionals between a conflict filled medical information system and seeking patients and citizens; librarians between a domain organized information system and seeking patrons and users. For the most part, evidence suggests that professional work very hard to be more responsiveness than the information systems that serve them.

*Study after study confirms that one of the important characteristics of interpersonally delivered expertise is its responsiveness to situational conditions. Pettigrew [172] documents that the information providers she studied intuitively focused on situational aspects of their user needs and not on personality or demography.

*Dervin [49,50] has discussed the need for redesigning systems so that they can support the information provider's mandate to focus on situations and material conditions of users. Professional burn-out she suggests comes at least in part from the disparity between the help people need and the system as designed. She has argued extensively that this gap can be bridged in design principles.

3.16. What responsive design could mean

An important similarity between the COMM literature and the LIS literature is the way in which both focus ultimately on design. An important difference is the way they do so. COMM focuses on introducing

change and gaining compliance; most often their target audiences did not choose to be targeted. In contrast, LIS focused on serving people who voluntarily come forward for information help. Yet, ultimately both come to the same conclusion about seekers: you serve better and you reach them better if you can be responsive to them. Traditionally, this aspect of communication – responsivity – has been relegated to the interpersonal and cultural domain. But the new technologies change the possibilities. What is important about the LIS literature is that it also begins to offer us a vision that systematic design of information systems could be based on process (or what Dervin calls the verbing human universals of movement through time-space) conceptualizations of information seeking and use. Dervin [48,49] argues that these process oriented categories when supported by empirical evidence can offer a way to give seekers flexible features that are at one and the same time human. These possibilities will be illustrated in the concluding section of this paper.

*Dervin has described Sense-Making Methodology as itself an example of a process or verbing-oriented approach to practice – i.e. the practice of defining research questions, interviewing informants, analyzing data, and drawing conclusions [48,56].

*Frenette [102,103] concludes from her work applying Sense-Making to campaign design that such research can help us envision how technologically interactive media might offer creative opportunities for health promotion in ways that are truly significant to people.

*Dervin and others have applied Sense-Making to a variety of specific design contexts – e.g. information design [49]; knowledge management systems [50]; reference library interactions [69]; journalistic and media practice and design [71,75]; campaign design [72,102,103,144]; the design of dialogue [82], Schaefer & Dervin [257].

4. On online communication: more of the same

Before turning to drawing conclusions and implications for research and practice designed to inform MedlinePlus, we need a brief foray into the emerging, and, indeed, overwhelming in quantity, studies focusing on the internet as a mode of sharing information generally and specifically regarding health issues. In providing this section, I am not pretending to have done a systematic and comprehensive review. Given quantity of work available and the disarray and contradictions in its attentions, this would be impossible. What I am providing is my "take" on the situation based on reasonably extensive reading [3,21,22,24,45,49,96,105,131,136,137,141,145,156,169,197,222,246].

Evidence is clear that use of the internet is growing exponentially. The Pew Charitable Trust web site currently last week posted a study that terms the internet the fastest diffusing communication technology in history (www.pewtrust.org). This exponential growth applies to health information seeking where estimates are that at least 30% of the population is seeking health information online.

There is also an accompanying exponential rush to document effects of such information provision (whether presented in more traditional one-way forms or less traditional interactive forms) on knowledge levels, beliefs, and so on. When seen from a reflexive vantage point in fact what we have is yet another new communication technology for which the predictions for utility and effects range from the optimistically utopian to the pessimistically dire. And, we have an emergent literature which mirrors the same conceptions of communication and information delivery which drive research outside the electronic context. In short, when both COMM field and LIS researchers address electronic communication they do so in much the same way that they address the same issues in non-electronic contexts. Of course, in the terrain of electronic communication there are new interlopers on the research scene – virtually every

discipline and field which in some ways focuses on human service delivery is doing "communication" research these days. They are joined as well by engineers, computer scientists, and the such. Despite the abundance of the emergent work, when examined closely it mostly mirrors the portraits and tensions which emerge from earlier relevant work in the COMM and LIS fields. And, for the most part it repeats past errors and provide us little to illuminate future research or design.

In general, the research on internet information seeking is confirming patterns seen along the adoption trajectories for each of the earlier communication technologies:

(a) There is an innovation impact which settles down as adoption and learning spreads. As the new technologies become regularized tools in life contexts their uses reflect past patterns. Bottom line, the new technologies will do for people what the prior technologies did, albeit from further distances, at great speeds, and in much larger quantities.

(b) Neither the pessimistically dire nor the optimistically utopian visions for the information providing and educating potentials of the new technologies seem to be coming true when examined as impacts on individuals.

(c) When examined from a political economic perspective, the technologies and their diffusion are clearly having a impact on media concentration and information ownership.

(d) There is documented "digital divide: between the "haves" and "have nots" globally and nationally which mirrors in principle that of other technologies and is accounted for by the power of economic access.

(e) There is also a feared "digital divide" informationally such that the optimistic predictions that internet will social class and education differences in population uses of more "expert" information sources is not being confirmed. This fear is being mirrored (as it was for prior media) with attention to the readability levels of internet information which have been judged, for example, as too high for the average patient as information seeker.

(f) *Evidence is already accumulating that what prevents better use of the web for information gaining and education is exactly the same factors which prevent better use of communication campaigns, or doctor's interactions, or information practitioner services or in-the-class presentations: a focus on transmission rather than communication.

There is, however, a characteristic of web communication that must be emphasized – its inherent possibilities for flexibility. This must be attended to in three sense. One is from the perspective of the user whom research shows exerts an extraordinary degree of control on their web searching as fast as their searching capabilities allow. This does not mean that users search as sources would want them to – for example, in all the right authoritative places. If anything evidence shows that most web information seekers are grabbing information indiscriminately without regard to its origins or standards. What the flexibilities of the web mean for users is that indeed they are in control. If they find themselves bored or feel manipulated, they leave at lightning speed.

The second is from the perspective of the information provider who is attempting to establish a better communicative connectivity to users with the web. It is true that users approach online sites with a higher expectation of support and interactivity than they do, for example, print media. But, as recent evidence has shown when the expectation of interactivity is not realized, the communicative gains are not only lost but seriously set back. An example is the U.S. citizenry and its emails to Congress which in quantity far outreach congressional capacity to cope. (www.pewtrust.org, 10-10-01)

The other aspect of web flexibilities is what it means for web design – that designers could use those flexibilities to permit different things to happen on the web than happen via other media or even face-to-face interaction. Most such uses on the web so far have been focused not on user views of information seeking but on system views. Thus, for example, a journal will provide hyper-links between every in-text citation and the full reference – a useful although extraordinarily labor intensive feature which has not been documented as worth the resources required to provide it. A few web sites have become more user-oriented, focusing on features that users find useful that were not easy to obtain in other channels. A good example is the way in which a book-selling web site allows web customers to link at will not only to reviews by experts but to reviews by other customers; and not only to other titles by the same author but to titles of other books ordered by customers who ordered this book. Responsiveness, to the extent that it exists online right now, exists primarily via system views of speeding up access to attributes of systems that have already been provided in the past; or by adding chatlines and talk rooms where communication can happen naturally.

The way in which the above review parallels the development of the COMM literature focusing on campaigns is illuminating. There is still a gap between communication design and communicative purpose. Relying in communication campaigns on informal and natural social networks as conveyers of information is not a bad idea; but is not a communicatively precise idea because it will appeal only to those for whom the social network is a viable and relevant source at that time for that situation. Relying on chatrooms and other spontaneous online dialogues has the same character. What is needed is an understanding of how to design communication so that users can navigate to meet their own needs on their own terms. For the first time, technological capacities permit this. The difficulty is the extent to which developments merely replicate past communication modes or invent new ones without regard to what research has already taught us about the potentials for systems to communicate more effectively.

5. Implications for research

In this final section, I draw implications from the above review for research on users of information systems. Based on the review above, it is assumed, of course, that the right kind of research can usefully inform design. It is also assumed that most prior research has not been able to do so well because it is has focused on things removed from the realities of information behavior – either system categories that are meaningless to seekers; or stereotypes of seekers that do not often fit their visions of themselves; or a host of system-driven nouns that are removed from information seeking actions.

All research is bound by the categories it imposes. If all we study are demographic characteristics of users, all meaningful differences not accounted for by demographic characteristics get relegated to error. In general, I adopts McGuire's [151] contextualizing mandate for social psychological research: always ask under what conditions the exception happened. My Sense-Making Methodology as an approach has attempted to do something more – to build this mandate into a research approach methodologically so there is no way to avoid asking the question. Further, Sense-Making does not simply invite diversity and difference. Instead, it invites it and then attempts to tame it applying understandings of human sense-making and sense-unmaking built on assumed human universals – in particular, how humans are mandated to make sense and unmake sense as they. ...

- move through a reality that is at least in part unpredictable and unruly
- dealing with and meeting human beings who are also at least in part unpredictable and unruly

- dealing with human beings who when they are not unpredictable are different in numerous ways
- dealing with systems and institutions in which there is constant tension and contradiction between human agent and organizational rule
- struggle to both align themselves with societal and institutional forces and at the same time to free themselves of these forces

Sense-Making assumes that the answer to this riddle is one of reconceptualizing our theorizings of information seeking and use from noun theories to verb theories. Sense-Making is itself an example. It starts foundationally, of course, with the well known critical incident technique [98]. However, while Flanagan's critical incident technique and Dervin's Sense-Making share, in common, an emphasis on the real-life situations of respondents, and while both also share an interpretively-oriented sensibility, Sense-Making attempts to go much further by applying a theory of how to study communication communicatively – i.e. not as transmission, but as dialogue. That theory is essentially based on the core Sense-Making metaphor of a person moving through an inherently changeable time-space, mandated to make sense across time and space (between self today and self yesterday; between a known situation yesterday and one today; between self and other; between self and system, and so on). The metaphor mandates focusing for each micro-moment on the situation with its history and constraints; its gaps (questions, muddles, confusions, barriers); the bridges the sense-maker makes (feelings, emotions, ideas); the strategies the sense-maker users for making them; and finally the outcomes constructed and/or collided with while leaving the sense-making moment to confront another one. Sense-Making assumes that sense-making and unmaking may be done repetitively or habitually or flexibly or capriciously and that this difference itself depends on situational conditions [except for the most chaotic and most rigid among us].

It is not the purpose of this paper to explain the intricacies of Sense-Making Methodology and why they are the way they are. Much will be left unsaid about the multiple ways that have been invented to pursue Sense-Making approaches – by phone, in the field, in groups, online; by interviewers or self-administered; focusing on tiny micro-moments in situations or focusing on whole situations; examining recent events or long-past events; using qualitative thematic and narrative analytic tools or quantitative content analytic and statistical tools; focusing on description or prediction or explanation. What I will do here is leap to the bottom-line – the research mandates which I will draw on in preparing research designs for the MEDLINEplus projects. The whys should in part be obvious based on the review above. Where they are not, the best supplementary readings are: [48,49,56,61,72,83].

What I present below is a brainstorming of possibilities, not a proposed design for a specific study. There is nothing accidental about any of these possibilities – each has been tested now in some 30 years of work by more than 100 researchers.

5.1 Study information seekers in terms of how they see the world, not how they respond to the researcher's world.

5.2 Always start by focusing on situations that are real to the respondent. In most cases, focus prior to intersection with the system and afterwards.

e.g.

Think of your most important use of MEDLINEplus (or your most recent use). What happened that led to it? What happened during it? What happened afterwards?

5.3   Enlist the respondent as a colleague. It may be appropriate to give respondents thinking time prior to the actual interviewing situation. Invite respondents to correct or change anything they have said to you during an interviewing, asking:
   e.g.
   In making that change, what leads you to do so?

5.4   In interacting with respondents, avoid insofar as possible asking questions based on the noun categories of the system. Instead base interviewing on a foundational open-ended platform focusing on Sense-Making questions, drawn from the Sense-Making metaphor. These sample questions are meant to be suggestive as there are many ways of asking Sense-Making questions.
   e.g.
   What happened — what happened first, second and so on?
   What conclusions or ideas did you come to? What led to them?
   How did they help? How did they hinder?
   What gaps or questions or muddles did you face? What led to them?
   How did they help? How did they hinder?
   Were there particular barriers that you faced? What led to them?
   How did they help? How did they hinder?
   In dealing with barriers and questions, what did you do? How did it help?
   How did it hinder?
   Were there things in particular about the system that bugged you or got in your way? What? How did they hinder? What did you do about it? Did it work?
   If you could wave a magic wand, what would be different about the system? What would have made using the system easier? How would these things help?
   Were there ideas of conclusions you hoped to reach which you were unable to? How would they help if you got to them? What prevented it?

5.5   Allow respondents to talk about how things changed and how they changed, e.g.
   e.g.
   Were there things that happened that you didn't predict – that surprised you? What? How did it impact you?
   Do you think your view of things changed in process? How? What difference did this make?

5.6   Invite respondents to talk about how things stay the same for them?
   e.g.
   Would you say you did things in this situation that you usually do? What? How did they help? How did they hinder?
   Did your idea of what you wanted stay the same throughout? What leads you to say that?

5.7   If your purpose is to generalize based on the respondent identities described culturally or in some other important demographic way, ask respondents for their views,
   e.g.
   You listed yourself as an Hispanic American. When you compare yourself to other Hispanic Americans, do you think this situation is a common one in at least some ways? What leads you to say that?
   Is there anything about it this situation as you experienced it which you think is different from that of most Hispanic Americans? What leads you to say that?

How do you think the system could help Hispanic Americans better?
How do you think it could help you better?

5.8   If you are doing group interviewing of some kind, provide respondents with time to talk unin-terrupted about their own situations and to then in a separate time frame to compare similarities and dissimilarities between themselves and others. The facilitator must enforce and model an even-handed, listening posture.

e.g.

As you were listening to (reading) answers from others in the group, were there ways in which you saw yourself as facing similar situations? What were these similarities?

Were there differences? What do you think explains them?

Were there things others said that you really agreed with?

Were there things you really disagreed with?

5.9   If you are not doing group interviewing, if at all possible find a way to involve diverse respondents at crucial stages in your interpreting and drawing conclusions from data. The guiding questions in 5.8 work well for this.

5.10   Find a way as well to involve diverse experts at crucial stages in your interpreting of and drawing conclusions from data.

5.11   In all the above, do as much as possible to allow respondents to specifically make the connection between, for each element of their answers. This is handled structurally in Sense-Making in-depth interviews, but can be approximated interpersonally in other interview formats.

e.g.

In in-depth work, this involves tracking each question (as an example) as a specific micro-moment: For the first question you asked, did you get an answer? Did the answer help? For the second question you asked, did you get an answer? Did the answer help?

In less micro-level work, the interviewer/facilitator can be listening carefully to the ways in which respondent talk makes pictures in terms of the Sense-Making metaphor. For example: If an respondent says they were help by getting ideas and by being motivated, the interviewer/facilitator can examine the picture created in mind by the respondent's answers in terms of whether it is clear what led to one help versus the other. If it is not clear, a follow-up query might be: You said that the _____ let you get some ideas to answer your questions, what was it that enabled you to feel motivated?

5.12   In general, structure data collection so as to start in the most open-ended ways working down to more directed probes if the context warrants it.

e.g.

First elicit the situation most important to respondents; then elicit a more recent situation if your intent is to map usual occurrences.

5.13   Because of the ways in which it is difficult for most respondents to say negative things to authority, teasing out what goes wrong may take special attention. To the extent that power differentials are seen as high between researcher and researched, repeated queries must be used to elicit negative information and the interview must not interject any non-listening responses. Specific and repeated invitations to respondents to talk about issues relating to power, ethics, and societal contradictions usually provide a

trust breakthrough [but only if trust is genuinely present; it can not be faked]. In addition, it may be helpful to summarize for use in the discussions any complaint files so as to open up an emphasis on negatives.

e.g.

Were there ways in which the system presented you with contradictions without assisting you in handling them? What would have helped?

Were there answers you didn't trust? What leads you to say that? What would have helped?

Some people have said that [name criticism]? Would you agree? Or disagree?

5.14   In analysis, in addition to whatever noun-based descriptions are mandated by your research context, rise above noun descriptions by conceptualizing a series of predictor or descriptor measures which capture time-space in different ways.

e.g.

*If your noun-based categories focus on social class or cultural ethnic differences, think of what situational and time-space anchored activities would result from those differences and use those as analysis categories.

*Look in the research context for variables which describe how the information seeker enters the information seeking situation in terms of involvement, interest, access, etc. – measures which are closer to the information seeking action than demography.

*Look for ways of describing specific internal and external communicatings and actions in informant stories in terms of how informants saw themselves moving through specific moments in time space. For example: Which informants saw themselves as coping with decisions where they had two or more roads ahead; versus which ones saw themselves as coping with out-of-control worries with no roads ahead?

*Categorize information seeking not only in terms of verb categories (i.e. what kinds of questions were asked) but also in terms of more generalizable universals: who, what, when, where, why, how, if …then, and what if.

*Look in particular at how informants saw themselves as helped and/or hindered and categorize these both in terms of noun descriptors, but also in terms of universals of movement: got ideas, got emotional support, got motivated; avoided a bad place; got pleasure; got relaxation, and so on.

*Look at differences in sense-making strategies in specific moments in time-space: users who searched, for example, for the big picture versus details; those who wanted to connect with someone facing a similar situation versus those who wanted to connect with someone like them culturally.

5.15   In general, find a way to pit descriptions of respondents against each other based not only on demographic categories but based on orientational, situational, and action categories as suggested. It is the juncture of this data which will most inform system design.

5.16   Always find ways to compare respondents in the same situation who reported sense-making differently; and respondents in different situations who reported sense-making similarly. Ask why? The answer leads to the next research question.

5.17   In analyzing helps, hinders, and magic wand responses, focus in particular on how respondent answers provide entries to system design features. Respondents often know what they need and can use but need to be asked in terms of their own movements through time-space.

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