Grounded Classification: Grounded Theory and Faceted Classification

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ABSTRACT

THIS ARTICLE COMPARES THE QUALITATIVE METHOD of grounded theory (GT) with Ranganathan's construction of faceted classifications (FC) in library and information science. Both struggle with a core problem—i.e., the representation of vernacular words and processes, empirically discovered, which will, although ethnographically faithful, be powerful beyond the single instance or case study. The article compares Glaser and Strauss's (1967) work with that of Ranganathan (1950).

INTRODUCTION

> There are some striking similarities. . .between field work and library research. When someone stands in the library stacks, he is, metaphorically, surrounded by voices begging to be heard. (Glaser & Strauss, 1967, p. 163)

> Classification is an uncovering of the thought-content of a written or expressed unit of thought. . . .The reference librarian. . .applies the classification scheme in the ultimate stage of library service which is effecting contact between the right reader and the right unit of thought in a personal way. (Ranganathan, 1951, p. 116)

The landscape of information retrieval is shifting rapidly (with networked distributed computing, large-scale digital libraries, and enormously powerful search engines). As the introduction to this issue notes, formerly firm boundaries between library and office, catalog and desktop are transmogrifying. The change means that a wider range of human

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activities come under the purview of library and information science. When the library and the desktop become seamless, then practices of work organization become part of the cataloging and indexing process. This merger calls for methodological creativity and cross fertilization between previously disparate methodological domains.

One fruitful direction for this creativity is in blending the methods of library and information science (LIS) with those of sociology and anthropology. LIS brings the strengths of order and sensitivity to domains and documents and a long tradition of struggling to find representations that are both useful and elegant. Sociology and anthropology bring strengths based in the empirical chaotic process of analyzing work, perspectives, conflict, and representations that are themselves the site of struggles.

Some of the tough challenges faced by classification in environments such as the World Wide Web or large digital libraries include: how work settings and the flow of real-life tasks give rise to information needs and strategies; how different vernaculars and representational schemes may work together heterogeneously; and how informal and formal classifications interact in information retrieval and use (Cochrane, 1993; Svenonius, 1986). In parallel fashion, some of the cutting edge challenges faced by grounded theorists include: assessing the quality and completeness of analysis; managing large amounts of unstructured textual data; and accounting for a basis for theoretical sampling. The two endeavors offer each other some aid in meeting their respective challenges.

Both faceted classification (FC) and grounded theory (GT) began as reform movements against powerfully entrenched a priori schemes with claims on universality. Grounded theory offers a way to include processes and actions in the analysis of vernacular representations (a question introduced as a core theoretical problem by Ranganathan). It is at the same time a source of theoretical richness for the understanding of intermingled types of work. Faceted classification offers a way to assess the structural integrity and architecture of a particular theory via facet analysis and other analytical tools used in thesaurus construction and assessment; with automated thesauri tools, FC is an aid for managing large bodies of text that will augment current qualitative methods software.

After writing the first draft of this article, a colleague brought Clare Beghtol's (1995) superb paper, "'Facets' as Interdisciplinary Undiscovered Public Knowledge: S.R. Ranganathan in India and L. Guttman in Israel," to my attention. Recursively, of course, our papers are an example of undiscovered public knowledge converging. Beghtol draws parallels between the work of Ranganathan and that of Louis Guttman, a sociologist who developed a faceted theory for the analysis of qualitative data, principally as an aide to the analysis of survey research data.

Though Beghtol (1995) notes that we will never know if proximate or remote contact transpired between Guttman and Ranganathan, she maps

out ways in which the two systems might profitably cooperate. They are, she notes, solving analogous problems of data analysis and management (p. 237). For all the structural reasons noted in the introduction above, there are now unique opportunities to exploit these previously unlinked bodies of research.

Classification Au Naturel

The notion that classification schemes are neither innocent nor arbitrary is core to several disciplines. Anthropologists map the complex taxonomic schemes of a culture as a way of understanding worldview and norms. Library researchers, going back to Ranganathan's original foundational work, see classification as core to mapping, in Ranganathan's words, "the universe of knowledge." Social critics of classification systems argue that the choice of categories reflects political choice and (the often silent) wielding of bureaucratic exercises of power (Berman, 1984; Kirk & Kutchins, 1992; Bowker & Star, 1994, In press; Bowker, Timmermans, & Star, 1995). Others have argued for the historical specificity of schemes of classification (Hacking, 1995; Young, 1995).

It has, however, been uncommon for two things to converge: (1) the idea that a qualitative social scientist might use the structures of formal classification systems as a proactive tool for generating and assessing theory; or (2) the idea that the theories and tools of qualitative social science might actively guide classification and indexing activities in library and information science. In other words, it is uncommon to see information systems classification as an ethnographic or theoretical enterprise, even where it has sometimes been seen as political. However, there are potential benefits to seeking this convergence. This article proposes a comparison of one of the more common qualitative methods—i.e., grounded theory (Glaser & Strauss, 1967; Strauss, 1987; Glaser, 1978) with the construction of faceted classifications in library and information science (compare Aitchison, Gilchrist, & Bowden, 1997; Vickery, 1960, 1966).

Basic Definitions

Grounded Theory

Grounded theory is a method for analyzing data; it is most commonly used on naturalistic field data but has also been used to analyze historical and documentary data (compare Clarke, 1990; Star, 1989). Barney Glaser and Anselm Strauss, who trained several generations of graduate students in sociology and nursing, developed grounded theory in the 1960s. The method has its roots in symbolic interactionist sociology and American Pragmatism, as well as, to some extent, Lazarsfeld's analysis of variables and their valences. (GT is enormously popular as a method in social science analysis. Its use—and some might argue misuse—extends from simply "empirical and inductive" to much more formal and thorough appli-

cations of the method. A recent volume by students and colleagues of Strauss provides a good overview of more thoroughgoing developments [Strauss & Corbin, 1997].)

Grounded theory relies on several components:

1. An empirical iterative approach to the collection and analysis of data—i.e., data are collected, analyzed, and revised cyclically as checked against empirical findings.
2. A constant comparative approach to the development of theory. Similarities across disparate domains are sought in order to reveal the dimensions present in a situation. Their discovery lends a kind of anthropological strangeness to the analysis of situations otherwise taken for granted. In this, less emphasis is placed on the degree to which a given variable presents itself in a situation. The best example of constant comparison comes from Everett Hughes (1970), a long-time colleague of Strauss's, who asked: "why is a priest like a prostitute?" (Answer: They both hear confessions in private, outsiders find their work somewhat mysterious, etc.) (p. 316). The point was to find the common dimensions, thus illuminating something about their work conditions—not to level the obvious disparities between the cases.
3. An approach to sampling which is theoretical rather than site or population driven—i.e., emphasis is put on making theories as richly complex as possible rather than on proving instantiations of hypotheses or applications of previous theories.
4. Theory development that works from substantive (close to descriptive) through to formal (abstract) levels as constant comparison proceeds over time. For example, early grounded theory studies looked substantively at dying patients in hospitals (Glaser & Strauss, 1965), detailing the many dimensions of the nursing, medical, and family situations. One of the important substantive focuses was: who was aware of the status of the dying patient as terminal, and what conditions gave rise to these differences in "awareness context?" Years later, Strauss (1978) took the awareness context concept and applied it to a variety of other circumstances in which awareness of conditions might be important, viz., being a spy, coming out as gay, being on either side of a bargaining table. The formal theory was developed as the comparisons ranged across substantive cases.

Faceted Classification

Faceted classification is "the sorting of terms in a given field of knowledge into homogeneous, mutually exclusive facets, each derived from the parent universe by a single characteristic of division" (Vickery, 1960, p. 12). Suggested in the 1930s by Ranganathan and codified in his system of classification, it has become an important tool in library and information science for constructing thesauri, building retrieval schemes for particular

groups of users, and in many circumstances for cataloging information. Important points are:

1. the division of fields of knowledge into categories that may express different aspects (facets) of the knowledge (especially from the point of view of information retrieval). This stands in contrast to schemes that would assign each document (book, article, and so on) to a single rigid value in a universal hierarchical classification scheme;
2. the combination of a system of notation, of analysis of knowledge classes, and the physical storage and retrieval of documents and parts of documents into an integrated system;
3. an iterative and evolving set of classifications which may flexibly serve the needs of particular groups of users;
4. the importance of comparing and synthesizing analytic facets in order to reflect changing knowledge and changing user needs;
5. a movement away from a flat proliferation of particular (phenomenological) aspects of a field of knowledge, toward a synthetic representation that includes basic (both abstract and concrete) categories. These latter, crucially, remain open to revision. (This article focuses on similarities between GT and FC. It does not do justice to all the important developments in FC, such as those proposed by the Classification Research Group in the 1960s on integrative levels, or the work in medical classification. A fuller history of classification research would examine these contributions.)

Common Ground

Both grounded theorists and designers of faceted classifications struggle with a common core problem. This is the question of how to represent vernacular words and processes. In both cases, the categories are empirically discovered in an almost self-contradictory fashion. The contradiction comes with the attempt simultaneously to represent, on the one hand, the local, specific, and empirical and on the other, abstractions and generalizations. The difficulty lies in making this representation both ethnographically faithful (faithful to the needs of users and particular populations), yet simultaneously powerful beyond the single instance or case study. Both grounded theory and faceted classification began as reform movements against powerfully entrenched a priori schemes with claims on universality (compare Vickery, 1960). These are unusual in that this reform did not consist of abandoning the attempt to formalize and systematize.

This set of common core methodological problems has been present since well before the advent of the Internet and the World Wide Web. Ranganathan struggled against the rigidities of the dominant universalistic library classification schemes, many of which originated in the nine-

teenth century. Glaser and Strauss (1967) struggled with powerful modes of social science research, occurring in the mid-1960s, that relied heavily on quantitative methods coupled with functionalist assumptions.

However, the landscape of information retrieval is shifting rapidly (with networked distributed computing, digital libraries, and large-scale and enormously powerful search engines). Although from the beginning Ranganathan argued for classification of documents by both physical existence and the ideas they contain (down to a very fine degree of analysis), today the nature of documents is in extreme flux and more than ever demands such analysis. The boundaries of documents are unclear as people modify and distribute them electronically; authorship is changing as multiple versions and annotations proliferate (Brown & Duguid, 1996). The ability to fracture and use pieces of documents as well means that library classification is now linked not only with traditional genres but also with work processes, communication, and writing (Levy & Marshall, 1994; Levy, 1994; Bishop & Star, 1996).

The landscape of qualitative research is similarly in flux due to the challenges posed by networked information technology. What does it mean to "observe" someone's writing on the Internet or World Wide Web? How do we "do fieldwork" when actions are taking place in such a geographically distributed fashion? How do we understand the links between local mixes of online/offline activities and those that appear on the Web? It is a two-edged sword—on the one hand, it seems that infinite ready-typed field notes lurk out there waiting for the analyst; on the other, little in traditional qualitative social science methodology can manage this volume of data and geographic dispersion.

As noted in the introduction to this volume, there has developed over the past several years a lively strand of qualitative inquiry in library and information science as well as in management information science. Dervin's (1992) sense-making methodology, for example, has been adapted in a number of empirical investigations of information use. A Web page for qualitative research in information systems is maintained at http://www.auckland.ac.nz/msis/isworld/index.html.

A comparison of grounded theory and faceted classification offers some important cross-fertilization in addressing these situations and lines of research. Some of the challenges faced by classification in environments such as the World Wide Web or large digital libraries include: how work settings and the flow of real-life tasks give rise to information needs and strategies; how different vernaculars and representational schemes may work together heterogeneously; and how informal and formal classifications interact in information retrieval and use.

At the same time, some of the challenges faced by grounded theorists include assessing the quality and completeness of analysis, managing large amounts of unstructured textual data, and accounting for a basis for

theoretical sampling. The two endeavors offer each other some aid in meeting this challenge. Grounded theory offers a way to include processes and actions in the analysis of vernacular representations (a question introduced as a core theoretical problem by Ranganathan) and a source of theoretical richness for the understanding of intermingled types of work (Strauss, 1994). Faceted classification offers a way to assess the structural integrity and architecture of a particular theory, via facet analysis and other analytical tools used in thesaurus construction and assessment with automated thesauri tools, a means for managing large bodies of text that will augment current qualitative methods software (Schatz, Johnson, Cochrane, & Chen, 1996).

Classifications as Theory Developing Tools

In an important article, Kwasnik (1992) places the theoretical aspect of classification schemes center stage. She states that:

> Classifications are really very much like theories. Like theories, classification schemes can provide an explanatory shell for looking at the world from a contextually determined perspective. Classification schemes not only reflect knowledge by being based on theory and displaying it in a useful way. . .but also classifications in themselves function as theories do and serve a similar role in inquiry. (p. 63)

She notes that, in the attempt to impose order and specify relations, classification schemes are inherently theoretical, just in the way that scientific theories are. Kwasnik goes on to use Ranganathan's faceted classification scheme to assess the structure of three scientific classificatory enterprises: the periodic table, psychiatric classification as it appears in the *DSM*,[3] and classification in software re-use. This novel evaluative use of facet analysis hints at a valuable tool for assessing theory construction. In Kwasnik's words: "Classifications have structural properties that lend themselves to representing knowledge in a given situation" (p. 80).

It follows from this that the construction of classification schemes is also an inherently methodological enterprise—i.e., one must make choices about analytic tools guided both by theoretical concerns, as Kwasnik suggests, and by questions of reliability, validity, doability, audience, and even the ripeness of particular scientific questions.

An article by Solomon (1991) also indicates the possibility of using classification schemes in research, this time specifically from a qualitative perspective. He argues that the construction of classification schemes is a form of technology development and one that must be closely linked to user semantics. Naturalistic methods of inquiry meet the requirements of handling what is often found in the field—i.e., ambiguity, multiple meanings, context dependence, and a gap between what users say and what they do (p. 164). In discussing his case study material, Solomon also notes that:

> The experience of the case study suggests that a multiple dimensional classification is needed to satisfy the diverse interests and information needs of the users involved. By faceting the interests and concerns of the managers involved, the unidimensional classification becomes less fuzzy and highlights key concerns in the resource allocations process: management requirements, scope of effort, resource requirements, and resource characteristics. (p. 169)

It is important to note that the evaluative component can be both used in theory construction (e.g., evaluating the usefulness of the classification scheme in process); in theory deconstruction (showing the theory-ladenness of all classification schemes); and in post-hoc and participatory user studies of extant classification schemes such as LCSH (Library of Congress Subject Headings) (Rosenberg & Borgman, 1992).

Some parallels between the early mandates of grounded theory and of Ranganathan's vision will now be discussed.

The Big Pictures

Critiques

Both Glaser and Strauss's (1967) work, *The Discovery of Grounded Theory*, and Ranganathan's (1950) foundational classification work (especially on the Colon Classification) read like manifestos. The enemy in both cases is reified rigid attempts at universal descriptions of knowledge that are not grounded in people's needs or experiences. From the grounded theory perspective, this meant taking on much of institutionalized American sociology, at that time (as now) largely quantitative, survey-oriented, and (then) functionalist:

> The qualitative research is generally labeled "unsystematic," "impressionistic," or "exploratory". . . . These critics, in their zeal for careful verification and for a degree of accuracy they never achieve, have forgotten both the generation of theory and the need for carefully appraising the different degrees of plausibility necessary for sociology's diverse tasks. (Glaser & Strauss, 1967, p. 223)

Glaser and Strauss go on vehemently to denounce Robert K. Merton for his attacks on qualitative methods, basically calling him an "armchair theorist." "His reasoning necessarily leads to the position that data should fit the theory, in contrast to our position that the theory should fit the data" (p. 261). "Verification" in the grounded theory vocabulary becomes a dirty word (later Glaser will extend this even to the word "scholarship," which he says is no substitute for getting out there and seeing for yourself).

Similarly, the impetus for Ranganathan's reform movement within library classification was first given as the explosion of knowledge following World War I and the attendant inability of older rigid classification systems to adapt and accommodate new and divergent viewpoints. Parallel with the grounded theory denunciation of verification above,

Ranganathan (1950) states that: "Hundreds have seen the attempts to represent specific subjects by arbitrary symbols without any organic relation to the ideas represented. Practically in all such cases a breakdown has come sooner or later" (p. 47).

Later, Reese (in Vickery, 1966) notes that faceted classification schemes are "mission-oriented rather than discipline oriented.. . . designed for user groups whose interests cut across the traditional fields" (p. 14). Faceted classifications do not follow pre-set categorization schemes deriving from disciplinary status-quo; rather, they demand semantic sensitivity and are designed to incorporate novel—that is to say, grounded—user needs. Vickery (1966) notes: "A faceted classification differs from the traditional in that the facets so distinguished are not locked into rigid, enumerative schedules, but are left to combine with each other in the fullest freedom, so that every type of relation between terms and between subjects may be expressed" (p. 13).

An Open Universe of Knowledge

Both grounded theory and faceted classification see the universe(s) of knowledge as potentially infinite, open, and evolving. Ranganathan (1965) says:

> For in the true Tree of Knowledge, one branch is grafted to another at many points. Twigs too get grafted in a similar way among themselves. Any branch and any twig are grafted similarly with one another. The trunks too become grafted among themselves. Even then the picture of the Tree of Knowledge is not complete. For the Tree of Knowledge grows into more than three dimensions. A two dimensional picture of it is not easily produced. There are classes studded all along all the twigs, all the branches, and all the trunks. (pp. 32-33)

A similar complexity is clear in all the grounded theory work, both in terms of interconnectedness and openness: "One of our deepest convictions is that social phenomena are complex phenomena. . . this is why grounded theory methodology emphasizes the need for developing many concepts and their linkages in order to capture a great deal of the variation that characterizes the central phenomena studied during any particular research project" (Strauss, 1987, p. 6).

Glaser and Strauss (1967) note that:

> The theorist's task is to make the most of his insights by developing them into systematic theory. His sociologist's perspective is never finished, not even when he writes the last line of his monograph—not even after he publishes it, since thereafter he often finds himself elaborating and amending his theory, knowing more now than when the research was formally concluded. (p. 256)

Some of the practical problems posed by both these approaches include developing schema for management of notation, managing the proliferation of codes (classes), responsible abstraction, and ongoing revisions.

Parallels in Approaches: Some Key Technical Details

The openness and centrality of complexity to both grounded theory and Ranganathan's faceted classifications approaches have made these both attractive and often difficult to learn. There is a constant tension between faithfulness to empirical detail and a desire to make the complexity usable via abstraction. Both FC and GT are techniques with long histories, schools of practice, and subtleties of interpretation far beyond the expository capabilities of this discussion. The following details are not exhaustive but are suggestive of key parallels in technical approach between the two systems. The GT examples rely heavily on Glaser (1978), perhaps providing the most formal statement of GT problems of coding and classification.

Constant Comparison and Analytic Synthesis

Both grounded theory and faceted classification have strong components of comparison and synthesis. From the GT point of view, as with the Hughes example of the priest and the prostitute, the comparison of even seemingly discrepant phenomena may illuminate valuable dimensions. Glaser (1978) notes: "*Actually apparent non-comparability is irrelevant, if the variable to be compared has a value in each group.* Comparing on the basis of properties of groups has the purpose of generating theory. . . . Comparing the apparently non-comparable increases the broad range of groups and ideas available" (p. 42) (emphasis in original).

Compare this with Vickery's (1960) discussion of FC: "[F]rom the theoretical point of view, faceted classification breaks free from the restriction of traditional classification to the hierarchical, genus-species relation: by combining terms in compound subjects it introduces new logical relations between them, thus better reflecting the complexity of knowledge" (p. 13). As Aitchison, Gilchrist, and Bowden (1997) note, FCs are designed so that new concepts may be built by combining existing class marks rather than by exhaustive enumeration (p. 55).

Levels of Formality

Both grounded theory and faceted classification (especially in Ranganathan's original formulation) emphasize orthogonal, but simultaneous, operations of coding categories. In GT, "[s]ubstantive codes conceptualize the empirical substance of the area of research. Theoretical codes conceptualize how the substantive codes may relate to each other as hypotheses to be integrated into the theory" (Glaser, 1978, p. 55). Substantive codes are arrived at by asking questions of the data that will result in classes, such as "of what is this an example?" Often constant comparison (or simply lateral thinking) will act to generate a class in this fashion (Strauss, 1987, p. 272).

In grounded theory, the substantive gives rise to the theoretical by asking questions of relationships between substantive categories. This is

exactly the interrogation made in analyzing a faceted classification scheme: Is this category broader or narrower than that? Which is the more basic? (Aitchison, Gilchrist, & Bowden, 1997). These questions are necessary to support the analytico-synthetic approach of Ranganathan.

"Coring Out" and Basic Classifications

As humans demand both simplicity of representation and the ability to combine and recombine, the problem noted above of simultaneous specificity and abstraction appears for both grounded theory and faceted classification as a very tricky mapping problem. Ranganathan (1965) says, on mapping these relations:

> The multi-dimensional universe of knowledge has to be transformed into a one-dimensional universe. Here arises an insoluble problem. It is well known that in the transformation of an *n*-dimensional space into a space of smaller number of dimensions and into a one-dimensional space or line in particular—or its equivalence, in the mapping of an *n*-dimensional space on a space of small number of dimensions and on a line in particular—many of the Immediate-Neighborhood-Relations among the classes are necessarily lost. (p. 33)

A similar mapping problem in grounded theory is called the core category problem, arrived at through open coding of field data. In this process, rapidly generated classes are related to each other, then recurring instances become core categories. As the data are coded and recoded and relationships specified, they are said to become saturated. This means that the mapping problem is solved through specifying a series of relationships, with the result of eventual convergence. In faceted classification, this is phrased as moving from the phenomenal to the seminal level. In grounded theory, more than one core category can originate from the same data over time, resulting in different focuses or emphases; it is not a matter of one underlying truth or form but rather the fashion in which relationships are specified. This is also true in the construction of FCs in the sense that multiple special thesauri may rely on the same data sources.

Both Ranganathan (1965) and Glaser (1978) argue that moving down to very fine points in the data helps the discovery of these classes. "In the view of the Postulate of Fundamental Categories, we should descend down and down, and allow the various subjects and ideas to become absorbed and reassembled, reabsorbed and again reassembled, and so on; until we find only five ultimate generic ideas—standing out" (Ranganathan, 1965, p. 198). These categories, often cited in library science, are personality, matter, energy, space, and time (PMEST)—basic attributes of all knowledge.

Similarly, Glaser (1978) recommends "fracturing the data"—i.e., looking at data line by line (pp. 57-58). Simultaneously, he notes that there are also several core (he lists eighteen) theoretical codes which can be

used, similar to the PMEST categories, to "maintain [a] conceptual level in writing about concepts and their interrelationships" (p. 73). Although more fine-grained than the PMEST category system, there are again interesting resonances as these families also cover space, time, and character. Glaser (1978) lists eighteen families of theoretical codes including: Process—stages, phases, transitions, ranks, etc.; Degree—limits, ranges, amounts, etc.; Dimensions—elements, pieces of, properties of, slices, segments, etc. (part-whole relations); and Ordering (including temporal ordering) (for a complete discussion of the families, see pp. 74-82).

Cross-Fertilization

Why are the parallels between grounded theory and faceted classification of interest? Earlier in this discussion it was mentioned that changes in the nature of information retrieval, networked computing, and thus of qualitative research all make the search for ways of ordering classes and categories more urgent. Automated thesauri and retrieval systems have made important advances in the direction of recognizing deep semantic similarities, often explicitly addressing problems in faceted classification (e.g., Schatz et al., 1996; Pollitt, 1997; Pollitt, Smith, & Braekevelt, 1996). At the same time, badly needed are the theoretical developments that will both help model complex data and be useful in naturalistic settings. This author suggests that FC may provide a helpful tool to analyze and construct grounded theories.

There are several software packages that support the analysis of qualitative data. Two were specifically targeted at grounded theory analysis—i.e., NUDIST and Atlas/ti. Without going into extensive comparison, both support flexible document coding. Atlas/ti captures many features of the discussion above in supporting flexible coding structures and bundles of codes for data collected using grounded theory (for a demo see http://www.cs.tu-berlin.de/~muhr/atlasti.html). It is thus possible to use Atlas/ti to build a thesaurus from one's own field notes and interrogate its structure as one would a faceted classification. As we understand the theory-ladenness of classification schemes, we may also come to understand more about the classification schemes embedded in our qualitative theories and methods.

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NOTES

[1] Beghtol notes a possible indirect or remote connection between the work of George Kelly, a psychological methodologist, and both Guttman and the classification community (p. 214). Another parallel exists here in my own work. As an undergraduate psychology major, I wrote my honors thesis using a combination of Kelly's Repertory Grid Method and Kuhn's notion of paradigm. This work reminded one of my advisors of the work of Glaser and Strauss, and they directed me to The Discovery of Grounded Theory. Some years later I became Strauss' student. On reading a draft of this paper, a colleague in Britain sent me a helpful message pointing out the similarities between grounded theory and Repertory Grids (personal construct theory, and directing me to a Web site at the University of Calgary dedicated to the latter [http://ksi.cpsc.ucalgary.ca:80/PCP/] (Mike Hales, e-mail communication to the author, 29 October 1996).

[2] An important exception, of course, is the work of anthropological linguists and taxonomists which falls into this category, and I do not mean to exclude their important contributions. However, much of their work does not develop theories in the sense that I am using the term in this paper, which should be clear from the context below. Rather, the findings are used as primary data from which theories are developed, as in structuralist anthropology. In any event, it would also be important for future work to compare the process of anthropological taxonomy with some of the LIS tools discussed.

[3] The *Diagnostic and Statistical Manual*, the major classification for psychiatry.

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