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Library & Information Science Research 28 (2006) 548–562
Library & Information Science Research

An analysis of the development and use of theory in library and information science research articles

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Available online 27 June 2006

Abstract

This study identifies the state and characteristics of theoretical research in library and information science journals by examining the number and the quality of theory incidents. Theory incident is characterized as an event in which the author contributes to the development or the use of theory in his/her own paper. This study assumes that both theory building and theory use are intertwined to construct a cohesive body of knowledge in the filed. Theory incidents were identified by a content analysis of 1661 articles in four LIS journals from 1984 to 2003. The findings suggest that 41.4% of the articles contributed to the development or use of theory. The overall proportion of theoretical articles has increased. They showed a tendency to converge into a few subfields, such as information seeking and use or information retrieval. However, the declining share of theory development articles in recent journal issues and the overall low level of theory incidents are urging LIS researchers to the importance of continuous and creative research in LIS.

1. Introduction

A direct investigation into the existence of theory in library and information science (LIS) literature allows for evaluating the nature of theoretical research in the field. The

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doi:10.1016/j.lisr.2006.03.018

existence of theory is "a mark of research seriousness and respectability" because it helps to organize unwieldy data and simplify the complexities of the social world (Van Maanen, 1998, p. xxix).

Theory is described as generalizations that can explain relationships among phenomena. Babbie (1995) defined theory as "a systematic explanation for the observed facts and laws that related to a particular aspect of life" (p. 49). Other scholars have noted that theory is "a set of interrelated constructs, definitions, and propositions that present a systematic view of phenomena by specifying relations among variables with the purpose of explaining and predicting the phenomena" (Kerlinger, 1986, p. 9); or "a multiple-level component of the research process, comprising a range of generalizations that move beyond a descriptive level to a more explanatory level" (Glazier & Grover, 2002, p. 319).

When considering a theory as an important element for establishing the identity of LIS, two aspects of a theory should be addressed: the development and the use of theory. The development of theory can be described as research work to build a new theory by exploring generalizable relationships among variables. On the other hand, the use of theory is referred to as a work to incorporate theory that was already developed by other researchers into the author's research paper. For example, Kuhlthau's (1988) research contributed to the development of a theory (to be accurate, a six-stage model of the information search process) as well as to the use of other researchers' theories (i.e., Kelly's personal construct theory) for the conceptual framework of her study.

Both the development and the use of theory are intertwined with the development of a cohesive body of LIS theory. Applying a theory to follow-up studies allows for testing the validity of the theory that has already been built. This is consistent with Grover and Glazier's view of theory building:

> "Theory building is a dynamic process. Theory is constantly being tested and revised according to the results of research. Therefore, theory should be considered as a verb; it is always in a state of evolution" (Grover & Glazier, 1986, p. 229).

2. Problem statement

Many previous scholars in LIS have considered a theory as a core for the discipline's maturity and have attempted to identify the theoretical base of LIS. The overall assessment results in the past studies have criticized the lack of theoretical research in LIS. Grover and Glazier (1986) stated that LIS research has been so narrowly focused, fragmented, and designed to solve situational, practical problems that it might be deficient in constructing the theoretical base of the field. Freehan, Gragg, Havener, and Kester (1987) also noted that the literature of LIS has not grown enough to support a cohesive body of its own theoretical foundation.

This dearth of contributions to the theoretical foundation may be explained with a reflection on the origin of the field. LIS has been initiated out of the needs of practical work such as the organization and management of materials in a library, documentation, and information retrieval. However, now it can probably be said that the filed has enough research

history to be a "science" treating social phenomena surrounding the library and information world. One possible set of evidence is the increase in the proportion of theoretical research articles chronologically, even though it is not an exact chronological increment and should be interpreted very carefully because of the use of various samples and different data analysis criteria. The percentage reported by several previous studies is the following: 13% of the articles published in 1984 (Feehan et al., 1987), 18.3% in both 1984–1989 and 1995–1998 (Julien & Duggan, 2000), 28% in 1990–1994 (Julien, 1996), and 34.1% in 1993–1998 (Pettigrew & McKechnie, 2001).

This study supposes that it is worth analyzing the state of LIS research at this point by focusing on theoretical research in order to obtain answers to two questions: Does LIS have its own theoretical base as a discipline? What characteristics does the theoretical framework have? Therefore, this study focuses on the "theory incident" to identify theoretical research among a myriad of articles published in four LIS journals. The theory incident is characterized as an event in which the author contributes to the development or the use of theory in his/her paper. This term is selected here to put both developed and used theories into the same line of the intertwined process of constructing the body of knowledge in LIS.

The purpose of the current study is twofold: to examine the number and the quality (i.e., the efficiency of a developed theory and the profundity of theory use) of theory incidents from both perspectives of theory development and theory use and to analyze the characteristics of these theory incidents with regard to the topic and publication year of the articles in which they are incorporated.

3. Literature review

There have been earlier efforts to analyze the state of theoretical research in LIS. Feehan et al. (1987) addressed both aspects of theory building and theory use, stating their definition as "articles which examine or attempt to formulate theories or principles which can provide a theoretical basis for LIS; the application of theories from other disciplines to our field is included here" (p. 184). However, since theoretical research was classified into subject categories such as general topics, professional concerns, theoretical topics, applied topics, and related fields, they may have overlooked theory incidents incorporated in other articles being classified under general, professional, and applied topics.

Julien (1996) (Julien & Duggan, 2000), Pettigrew and McKechnie (2001), and Jeong and Kim (2005) were inclined to analyze only the use of theory. In Julien's studies, theoretical articles were defined as "those based on a coherent and explicit framework of assumptions, definitions, and propositions that, taken together, have some explanatory power" (Julien, 1996, p. 56). Pettigrew and McKechnie (2001) operationalized theory as ones described as conceptual, framework, grounded or underpinnings in the article by the author and reported that 34.1% of the 1160 articles incorporated an average of 2.73 theories. They also found the theoretical base of LIS depended on the social sciences when the origin of theories was examined among LIS, social sciences, sciences, and humanities. Jeong and Kim (2005) referred to theory as what is described as a theory, model, or law by the author other than the

researcher who proposed it. By doing a content analysis of 654 articles in two Korean journals since 1970, they analyzed both the number and quality of the theories incorporated and presented a five-point scheme (see Methodology) for measuring the quality of applying theory. Twenty percent of the articles used an average of 1.98 theories and the theories were usually mentioned for the background review of the papers. Although other studies such as Warner (1991) and Barkhi and Sheetx (2001) examined the use of theory in LIS research, their focus was on a specific subfield such as linguistic theory and information systems.

As for the aspect of theory building, Jeong (1993) proposed a model of theory efficiency based upon a concept of "efficiency of law" (see Methodology) and analyzed the level of authors' theory building from 1970 to 1992 in Korea. Of 338 research articles, 6.5% contributed to theory building and the average level of theory efficiency was low. McGrath (2002) investigated LIS research articles of the type that could contribute to the development of theory. By decomposing theories developed by authors into dependent variables, independent variables, and units of analysis, he revealed the existence of some common elements in library science research and urged researchers to unify them for an integrated grand theory.

A weakness of these studies is that they dealt with either theory building or theory use, rather than considering them altogether. Therefore, this study attempts to cover both theory incidents and defines them as broadly as possible (see Conceptualization) to understand the widest range of the theory base in LIS research and as objectively as possible for the reliability of identifying theory incidents. As others, such as Boyce and Kraft (1985) and Buckland (1991, pp. 17–25), have suggested, a strictly defined standard would not allow for the finding of many theories, even those considered as theories within the bounds of LIS, because theories in this field may have "the status of quasi-theories" (Boyce & Kraft, 1985, p. 155).

4. Conceptualization

This study adopts the "taxonomy of theory," consisting of three categories: substantive theory, formal theory, and grand theory (Glaser & Strauss, 1967; Grover & Glazier, 1986). Substantive theory, as the first theory level, is defined as "a set of propositions which furnish an explanation for an applied area of inquiry" (Grover & Glazier, 1986, p. 233). It was developed for an empirical area or somewhat narrow range of subfields. In fact, it may not be seen as a "theory," but rather be likely to be treated as a tested hypothesis or just a research finding. However, substantive theory has potential to provide us with explanations and predictions about the world associated with LIS research and to evolve into "real" theory. The next level of theory, formal theory, is defined as "a set of propositions which furnish an explanation for a formal or conceptual area of inquiry" (Grover & Glazier, 1986, p. 234) at the level of a discipline. Next, grand theory is defined as "a set of theories or generalizations that transcend the borders of disciplines to explain relationships among phenomena" (Glazier & Grover, 2002, p. 321). Sometimes, it may help to refer to both formal and grand theories as "theory."

Substantive and formal theories together are commonly considered as "middle range" theory in social science. The difference of both types of theory exists at the level of generality, that is, the power of explanation and prediction. For example, in a study of information use behavior of Web users, observing Web use behaviors of sampled small-size college students could generate a substantive level theory. However, if the focus is on the generation of formal theory, then analysis would be made among different kinds of substantive cases which fall within the formal area (Glaser & Strauss, 1967). The sample size should be extended enough to represent behavioral characteristics of college students or comparative analysis among various groups (i.e., young and old people, college students, workers, or women) for generalization on information behavior of Web users.

Substantive level theory is considered in this study as an analysis target for identifying theory development contribution and operationalized to a tested hypothesis or a discovered relationship. On the other hand, both formal and grand level theories are treated as an analysis unit of theory use and defined here as "theory", "model", or "law" by researchers other than the author who proposed it (see Methodology for further explanation).

In order to analyze the nature of the theoretical research, this study adopts Glazier and Grover's (2002) concept of "circuits of theory," which emphasized that theory is generated and evolving while closely interacting with three contextual modules: self, society, and knowledge. The individual self is a key aspect to functioning perception, interpretation, and conceptualization. Individual knowledge is integrated into the broader arena of social knowledge through the process of research and theorizing. However, the self can operate and survive only within the context of society. The society is created by the mutual acceptance of group norms, values, beliefs, and knowledge. The knowledge, both discovered and undiscovered, is not only the product, but also the start of the research process.

Three modules are operationalized here into the researcher (i.e., affiliation, department, and period of research experience) for self, research background (i.e., article publication year, publication country, and type of journal) for society, and research content (i.e., research topic and methodology) for knowledge. All these variables were examined in the original dissertation of the primary author (Kim, 2004), but the current paper reports findings related to two variables (publication year and research topic) due to page limitations.

The operationalization certainly allows for an empirical analysis of the research inquiry, but could simultaneously raise another problem, representativeness, in particular, ignoring other variables. For example, previous degrees the researchers have, other than an LIS degree, might impact the development and use of theory. The useful context module that Glazier and Grover attempted to incorporate might have been reduced to a few easily identifiable variables. Therefore, this limitation must be considered carefully in interpreting the findings of this study.

5. Methodology

Theory incidents were identified by a content analysis of 1661 research articles published in four LIS journals between 1984 and 2003. This analysis focuses on finding

theoretical articles that have developed and/or used theories and on coding publication year and topic of those articles.

Two international and two Korean journals were chosen for this study. The two international ones, *JASIST* and *LISR*, have a high level of *SSCI* impact factor in LIS area and the Korean ones are also top-ranked in Korean LIS society. They all contain peer-reviewed full-length research articles. The reason to sample international and Korean journals together is twofold. One reason is to analyze the characteristics of theoretical articles according to different research backgrounds (i.e., impact of journal or country). The other is to identify the state of theoretical research in Korean journals compared with that of international journals. Despite the difference in history of LIS research, this study expects that the comprehensive findings could give critical insights for understanding the theoretical base of LIS. The source information is below:

- *Journal of the American Society for Information Science and Technology* (*JASIST*; 6 issues per year for 1984–1989; 8 issues per year for 1990; 10 issues per year for 1991–1995; 12 issues per year for 1996–1997; 14 issues per year for 1998–2003)
- *Library and Information Science Research* (*LISR*; quarterly)
- *Journal of the Korean Society for Information Management* (*JKSIM*; annual for 1984; biannual for 1985–1997; three issues per year for 1998; quarterly for 1999–2003)
- *Journal of the Korean Society for Library and Information Science* (*JKSLIS*; annual for 1984–1988; biannual for 1989–1995; quarterly for 1996–2003).

It is important to note that the publication frequency of *JASIST* was so high that this study extracted only four issues in March, June, September, and December in order to have a sample comparable to other quarterly journals.

Articles related to theory building are identified if any significant relationships are found by a hypothesis testing. This approach might be open to criticism in that qualitative, inductive, or grounded approaches could be ignored even if they generated new substantive theory in ways similar to those in quantitative work. However, this study gives much weight to the objectivity in finding theory incidents contributing to theory development since it would be very subjective to judge that any research findings could be qualified for a substantive level theory. In addition, authors are very likely to refer their findings by using the terms theory or model.

In the same line, theory incidents of theory use are also identified only in the case that they are named by other authors as a theory, model, or law. Yet another rule is added to the identification stage of theory use incidents: if only an author describes a concept as a theory (or model/law), the concept is treated as theory throughout this study. For example, even in the case that an author describes Dervin's (1983) Sense-Making as a methodology, the Dervin's concept could be checked as a theory if the Sense-Making concept has ever been named as a theory in any article in the sample. Repeatedly conducting content analysis procedures required much energy and patience. However, this effort may provide a chance to grab even the case where an author him/herself is proposing a new theory based on a grounded approach. If the newly suggested finding deserves to be a theory, someone would cite it as "theory" in their papers.

5.1. Criteria for quality measurement

Two criteria, the degree of theory efficiency and the degree of theory use, are adopted to measure the extent of the impact of theory incidents on the research article in which they are employed.

A model of theory efficiency was proposed by Jeong (1993) as a categorical measure based in the concept of Dubin's (1969) "efficiency of law." Theory efficiency refers to "the range of variability in the values of one unit to the values of another unit in a relationship" (Dubin, 1969, p. 110). This measure was devised to evaluate the precision in the prediction of a substantive theory. It assumes that a theory with the highest efficiency level can predict other changes of theory units more precisely. This model consists of the following categories:

(1) "Relatedness"—The lowest level of efficiency positing that a theory can reveal whether there are significant relationships among theory units.
(2) "Directionality"—The next higher level, which expresses whether a theory can explain the directionality of the relationship (i.e., a positive or negative correlation).
(3) "Co-variation"—The third level, which predicts change in one unit when the other unit alters.
(4) "Rate of change"—The highest level, which states the rate of change in the relationship.

The five degrees of theory using model is for assessing the level of profundity to which a theory incident is incorporated into the research. Jeong and Kim (2005) tested the validity of this measure by examining 654 research articles and coded 260 theory incidents into one of the five categories below:

(1) "Spot citing"—The lowest level of use, which mentions only the name of theory in the background or literature review section without any explanation or citation.
(2) "Background review"—The next higher level, which explains the core concepts of theory with a paragraph or so in the literature review or conceptualization part. Citations are included from this level to the upper ones.
(3) "Theory discussion"—The third level, which gives an in-depth explanation of theory itself on a page or so in the body of the article.
(4) "Theory application"—The fourth level, which directly applies theory to a conceptual framework of the research, methodology design, or interpretation of research findings.
(5) "Analytic evaluation"—The highest level, in which a theory is used most heavily as the main theoretical basis through the article. A good example would be a case where a researcher tries to test the applicability of theory to new arenas and to re-explain it from a new point of view.

While both criteria are categorical measures, they also have an ordinal dimension in the theoretical depth of theory incidents. Therefore, here they were coded in ascending order

from one to four or five (i.e., relatedness and spot citing were coded as one, directionality and background review as two, etc.).

Inter-judge reliability tests were conducted for subfield classification, identification of theory incidents, and quality measurement. Three independent coders (a Ph.D. student and two master's students) coded a sample of 199 articles published in 1990 and 2000. The reliability coefficients ranged from 0.94–0.97. Based on the percentage agreement index of Scott (1955), the subject scheme, operational definitions of theory, and quality measurement criteria showed good reliability.

6. Results

6.1. The development of theory

Of the 1661 articles, 21.79% (n = 362) contributed to the development of theory. International journals developed 222 substantive theories (61.33%) and Korean journals had 140 cases (38.67%). Table 1 shows that the overall proportion of theory development articles has increased by year, although the proportion in 1999–2003 slightly decreased. This declining tendency appeared especially in recent international journals.

Table 2 represents the efficiency level of the 362 substantive theories. The total average of efficiency level was 1.94 out of 4 points. The mean of theory efficiency in international journals (mean = 1.92) was slightly lower than that of Korean journals (mean = 1.97), but this difference was not statistically significant (T = −575, p = 0.556). Although the efficiency level fluctuated by 5 years, most substantive theories (51% of the 362 theories) across countries and publication years were explaining "directionality" of the relationship between variables.

Table 3 shows the distribution of theory development articles by subfield. Overall, articles on information seeking and use have most strongly contributed to theory generation (18.23% of the total), followed by articles about information retrieval (14.36%), and library management (11.60%). An interesting finding here is that the top five topics are almost identical between the international and Korean journals.

As for the efficiency level of substantive theories by subfield, theories under the topic "general LIS" have the highest efficiency level (mean = 2.64) with the exception of

Table 1
Theory development by 5-year period of publication

Year	International journals		Korean journals		Total	
	n	%	n	%	n	%
1984–1988	61	27.48	7	5.00	68	18.78
1989–1993	65	29.28	35	25.00	100	27.62
1994–1998	57	25.68	44	31.43	101	27.90
1999–2003	39	17.57	54	38.57	93	25.69
Total	222	100.00	140	100.00	362	100.00

Table 2
Level of theory efficiency by 5-year period

Year	International journals		Korean journals		Total	
	Mean	SD	Mean	SD	Mean	SD
1984–1988	1.84	0.88	1.71	0.49	1.82	0.85
1989–1993	2.06	0.93	2.14	0.94	2.09	0.93
1994–1998	1.91	0.69	1.89	0.95	1.90	0.81
1999–2003	1.82	0.87	1.96	0.75	1.90	0.80
Total	1.92	0.85	1.97	0.86	1.94	0.85

bibliometrics, the topic associated only with international journals. Following are theories on library management and on resource management. The result of the ANOVA test determined that these differences were statistically significant ($F = 2.299$, $p = 0.010$) (Table 4).

6.2. The use of theory

A total of 897 incidents of theory use were identified in 25.95% ($n = 431$) of the 1661 articles. This total indicates that each article contained an average of 0.54 theories. When considering only the 431 articles that used theory, the average increased to 2.08. Table 5 represents the changes in number of theory use incidents by a 5-year period. The overall proportion has increased, although the productivity in 1994–1998 slightly decreased. Both international and Korean journals show a similar pattern of increase but, in particular, the frequency of theory use rose suddenly in Korean journals from 1999 to 2003.

Regarding the quality of 897 theory use incidents, the total average of the degree was 2.39 out of 5 points. The average in international journals (mean = 2.56) was higher than that of

Table 3
Theory development by subfield (%)

Subfield	International journals ($n = 222$)	Korean journals ($n = 140$)	Total ($n = 362$)
Information seeking and use	18.02	18.57	18.23
Information retrieval	15.77	12.14	14.36
Library management	10.36	13.57	11.60
Scholarly communication	9.91	10.00	9.94
Information service	7.21	11.43	8.84
Internet	8.11	8.57	8.29
Professionals	8.56	6.43	7.73
Resource management	7.66	5.00	6.63
Education	5.41	7.86	6.35
Systems	5.41	2.86	4.42
General LIS	2.70	3.57	3.04
Bibliometrics	0.90	0.00	0.55
Total	100.00	100.00	100.00

Table 4
Efficiency level of substantive theories by subfield

Subfield	International journals		Korean journals		Total	
	Mean	SD	Mean	SD	Mean	SD
General LIS	2.33	0.82	3.00	1.41	2.64	1.12
Library management	2.04	0.71	2.32	0.89	2.17	0.79
Resource management	2.06	0.97	2.43	0.98	2.17	0.96
Information seeking and use	1.95	0.99	1.92	0.93	1.94	0.96
Internet	2.06	0.87	1.75	0.87	1.93	0.87
Information retrieval	1.94	0.87	1.82	0.64	1.90	0.80
Education	2.08	0.67	1.64	0.67	1.87	0.69
Professionals	1.79	0.71	2.00	0.71	1.86	0.71
Information service	1.69	0.95	2.00	0.82	1.84	0.88
Systems	1.75	0.87	1.75	0.96	1.75	0.86
Scholarly communication	1.52	0.60	1.64	0.50	1.57	0.56
Bibliometrics	3.00	0.00	0.00	0.00	3.00	0.00
Total	1.92	0.85	1.97	0.86	1.94	0.85

Korean journals (mean = 2.11). However, no significant difference was determined in the level of theory use by publication year or by journal group (Table 6). Most of the theory use incidents (47.38%) were applied at the level of "background review" (the second level of the five stages).

Considering the distribution of theory use incidents by subfield, Table 7 shows that the information retrieval area has most frequently incorporated the existing theories (n = 208, 23.19%). This tendency is shown in both international and Korean journals. Another noticeable finding is that international journals have many theory use incidents in articles on information seeking and use, whereas in Korean journals, many theory incidents are incorporated into scholarly communication articles.

The overall level of theory use was beyond the second stage, "background review," in almost all subfields except for scholarly communication (Table 8). Yet, the profundity level of theory use in Korean journals was lower than that of international journals in most subfields. The result of a general linear model test determined significant differences in the level of theory use between journal groups by subfield (F = 2.522, p = 0.004). The noticeable

Table 5
Incidents of theory use by 5-year period

Year	International journals		Korean journals		Total	
	n	%	n	%	n	%
1984–1988	103	18.26	57	17.12	160	17.84
1989–1993	144	25.53	70	21.02	214	23.86
1994–1998	115	20.39	69	20.72	184	20.51
1999–2003	202	35.82	137	41.14	339	37.79
Total	564	100.00	333	100.00	897	100.00

Table 6
Level of theory use by 5-year period

Year	International journals		Korean journals		Total	
	Mean	SD	Mean	SD	Mean	SD
1984–1988	2.46	1.20	2.23	1.13	2.38	1.18
1989–1993	2.60	1.11	2.21	1.12	2.47	1.12
1994–1998	2.69	1.27	2.29	0.99	2.54	1.19
1999–2003	2.52	1.17	1.91	1.10	2.27	1.18
Total	2.56	1.18	2.11	1.09	2.39	1.17

subfields having a significant difference are bibliometrics, education, resource management, and scholarly communication.

7. Discussion

Based on the assumption that the existence of theory reflects a discipline's maturity and seriousness, the results have good insights on the theoretical base of LIS research. A total of 41.4% of the 1661 articles, when considering both incidents of theory building and theory use together, represents the increase in the proportion of theoretical articles. This total percentage was higher than findings of previous studies in which the proportion of theoretical articles in LIS journals was reported from 13% to 34.1% (Feehan et al., 1987; Julien, 1996; Julien & Duggan, 2000; Pettigrew & McKechnie, 2001). This increase might be due to the attempts of this study to cover both theory development and theory use incidents and to define them broadly and objectively.

Table 7
Percentage of theory use incidents by subfield (%)

Subfield	International journals (n = 564)	Korean journals (n = 333)	Total (n = 897)
Information retrieval	20.74	27.33	23.19
Information seeking and use	24.65	7.21	18.17
Scholarly communication	5.85	23.12	12.26
Bibliometrics	11.70	5.41	9.36
Internet	7.62	4.20	6.35
Systems	5.50	7.51	6.24
Library management	5.50	6.91	6.02
Resource management	4.43	5.11	4.68
General LIS	6.38	0.90	4.35
Information service	4.26	4.50	4.35
Education	1.77	5.11	3.01
Professionals	1.60	2.70	2.01
Total	100.00	100.00	100.00

Table 8
Level of theory use by subfield

Subfield	International journals		Korean journals		Total	
	Mean	SD	Mean	SD	Mean	SD
Information service	2.67	1.13	2.60	0.98	2.64	1.06
Library management	2.74	1.15	2.43	0.99	2.61	1.09
Information seeking and use	2.53	1.08	2.92	0.93	2.59	1.06
Information retrieval	2.57	1.14	2.46	0.95	2.52	1.06
Bibliometrics	2.76	1.48	1.67	1.33	2.52	1.51
General LIS	2.44	1.11	2.67	2.08	2.46	1.17
Education	3.00	1.05	2.06	0.83	2.41	1.01
Professionals	2.67	1.32	2.11	1.45	2.39	1.38
Internet	2.56	1.24	1.86	1.03	2.39	1.22
Systems	2.39	1.09	2.32	1.07	2.36	1.07
Resource management	2.48	1.33	1.82	0.81	2.21	1.18
Scholarly communication	2.21	1.14	1.38	0.89	1.63	1.04
Total	2.56	1.18	2.11	1.09	2.39	1.17

The findings also showed the number of both incidents of theory building and theory use has increased by year. Evidence of this increasing pattern can also be found in the results of other studies even though different samples and criteria were used. As mentioned above, the proportion of theoretical articles in 1984 was 13% (Feehan et al., 1987), 18.3% in both 1984–1989 and 1995–1998 (Julien & Duggan, 2000), 28% in 1990–1994 (Julien, 1996), and 34.1% in 1993–1998 (Pettigrew & McKechnie, 2001). This increase by year could be explained as researchers making more efforts to construct a theoretical base of LIS so that the field can have its own identity as a discipline.

However, an apparent difference in the total proportion of theoretical articles was evident between international and Korean journals. The total percentage remarkably increased to 61.28% in international journals, while the amount in Korean journals declined to only 26.19%. This numerical difference might be evidence that the state of the theoretical framework of LIS in Korea is young. Compared to the long history of the field itself since 1887, when the first library science education program was established at Columbia University by Melvil Dewey (Bramley, 1969, p. 78–80), the history of LIS in Korea dates back to the foundation of the Department of Library Science at Yonsei University in 1957 (Jo, 2004). Yet, the findings about the continuously increasing rate of the proportion also show that Korean research articles have been focusing more on the development of the theoretical foundation of the field.

On the other hand, it is worth noting the decline in the percentage of theory building incidents, particularly in international journals from 1999 to 2003. The figure was clearly the lowest among all the sampling periods. This decrease represents the current LIS research trend that is inclined to use existing theory rather than to generate new theories. In addition, the quality level of both theory building and use incidents was classified into the middle stage of each measure. These findings together are alarming researchers about a need for more substantial contribution to constructing a cohesive body of knowledge in LIS.

The distribution of theoretical articles by subfield gives a range of implications for the understanding of characteristics of LIS theoretical base. Journal articles, especially on information seeking and use and information retrieval, have contributed significantly to the growth of the theoretical framework. The convergent tendency of theory incidents in the two subfields can be supported by the findings of Pettigrew and McKechnie (2001).[1] They reported, particularly in the aspect of theory use, that articles on information retrieval most frequently incorporated theory incidents (30.84%, 334 of the 1083 theory incidents) and research on information seeking and use (labeled as human information behavior in their study though) used the second most amount of theories (17.45%, 189 of the 1083 theory incidents).

In Korean journals, however, the proportion of theory incidents in the articles on information seeking and use was remarkably small (only 7% of the total). Rather, Korean researchers are likely to apply theories the second most frequently into the articles on scholarly communication. Considered with the quality level of incorporated theories, it is noticeable that the level of theories used into scholar communication research was significantly lowest among all categories. This intertwined approach indicates that Korean researchers have a strong tendency to incorporate theory into their research on scholarly communication but have failed to reach a profound stage of theory use.

8. Conclusion

This study attempted to address both aspects of theory building and use, opening the possibility of carefully examining the state of theoretical research and closely monitoring research trends in the field. The overall rising trend in the proportion of theoretical articles demonstrated the closer relationship of LIS research with theory. There would be room for the intervention of other factors such as the productivity increase in article publication, though. The substantial proportion (over 60%) of theory incidents in international journals, in particular, supports the conclusion that LIS research has already established its own theoretical framework.

However, the declining share of theory development articles and the heavy concentration of theoretical articles on some specific topics, such as information seeking/use and information retrieval, are awakening LIS researchers to the importance of continuous and creative research work for all subfields in LIS. Despite the difference in the proportion of theory incidents between international and Korean journals, a similar level in the efficiency level of generated theories and in the profundity level of used theories also suggests a need for more theoretically grounded research.

Further analyses are underway, which focus more attention on specifying the characteristics of theory incidents (for example, the name of the theory used and its origin discipline or origin year). Such work could more clearly reveal the nature of the discipline, especially its identity and interdisciplinarity. Additional research that attempts to identify the impact of LIS

[1] Their raw data were recalculated here because of the different subfield classification scheme.

theories on other related disciplines, such as communications, computer science, and management, would also be of value.

Acknowledgments

This article is based on a doctoral dissertation of the first author under the supervision of the second author. The dissertation was supported by the Korean Research Foundation Grant (KRF-2002-908-H00001). The authors thank the other members of the committee, including Bong-Hee Kim, Yeon-Kyung Chung, Suk-Du Choi, and Mikyong Cha in the Department of Library and Information Science at Ewha Women's University, South Korea, for their sincere directions, comments, and suggestions for this research. We also thank the anonymous referees for their comments for improving this article.

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