



The role of subject literature in scholarly communication

Subject literature
in scholarly
communication

An interpretation based on social epistemology

463

Jack Andersen

*Department of Information Studies, Royal School of Library and
Information Science, Copenhagen, Denmark*

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Abstract *In this article an epistemological interpretation of the role of subject literature in scholarly communication shall be proposed. Such an interpretation will focus on the epistemological dimension of communicating knowledge through literature and how this is achieved through discursive and rhetorical means. It will be argued that library and information science (LIS) theory on scholarly communication can be supplemented and strengthened by this interpretation. By establishing a social epistemology of subject literature the article contributes with a sketch of a coherent theory of scholarly literature explaining the epistemological and communicative division of labor between the various types of subject literature. Such a theory is in line with the current revival of social epistemology in LIS. The article is structured into three main sections. The first section will outline an epistemological position that pays particular attention to knowledge acquired through social interaction in general, and through interaction with written texts in particular. The works of the later Wittgenstein and Ludwik Fleck will be used as the theoretical frameworks. Having established this epistemological framework, the second section will outline what is considered to be the main types of subject literature, with emphasis on their discursive and rhetorical functions in scholarly communication. The third section will synthesize the two other sections into a sketch of a theory that will be labeled the social epistemology of subject literature and point to some implications for LIS research of this theory.*

Introduction

Scholarly communication is an area of research that has received much attention in library and information science (LIS). In general, this research can be characterized as being centered on the literatures involved in scholarly communication. Bibliometrics, for instance, represents a quantitative approach to the study of the structure and organization of scholarly communication (Donohue, 1973; Borgman, 1990). Citation analysis examines the role of citations in scholarly communication (Cronin, 1984). Information retrieval (IR) research seeks to develop retrieval techniques capable of finding relevant documents (Belkin and Croft, 1987). From the point of view of relevance research, Saracevic (1975) proposed a subject literature view of relevance. He claimed that due to problems in scholarly communication the notion of relevance was central in LIS and pointed, among other things, to the significance of the structures of subject literature involved. Information seeking studies have examined the various uses of information sources by scholars (e.g. Ellis, 1989). Knowledge organization theory is concerned with devising



frameworks for methods and principles that can lead to the improvement of the intellectual access to scholarly literature (e.g. Vickery, 1959; Foskett, 1974; Langridge, 1976; Tibbo, 1993). More recently, Borgman (2000) has discussed the relationship between digital libraries and scholarly communication and the role of literatures in these new electronic environments. This suggests that many main areas of research within LIS are actually devoted, some way or another, to scholarly communication and points to the significance of subject literatures[1].

The notion of subject literature

A lot of research has been done into literature exclusively not falling into the category of fiction (see e.g. Bazerman, 1988; Bazerman and Paradis, 1991; Brier *et al.* (1997); Dear, 1991; Grepstad, 1997; Hyland, 2000; Johnsen, 1995; Myers, 1990; Selzer, 1993; Swales, 1990). These writers have from a variety of approaches examined literature not belonging to fiction (i.e. subject literature). They all seem to agree on the point that subject literature is an area worth approaching much in the same way as fiction, i.e. as literature. That is, they pay attention to such issues as plot, narrative, genre, rhetorical features, the role of the author, text and reader, and the relationship between these in subject literature. However, LIS has not contributed that much to this body of research, although it has much to contribute with.

In the following it will be argued that in order to analyze subject literatures quantitatively, developing retrieval techniques, or organizing literatures in various information systems such as, for instance, scholarly bibliographies or classification systems, an adequate understanding of what kind of work the different kinds of literatures are performing in scholarly communication can supplement and strengthen the significance of LIS theory on these matters. For instance, in knowledge organization there is a complex relationship between the knowledge articles claim to contribute with and the corresponding representation and organization of the knowledge claims in information systems. Understanding how and on what grounds knowledge claims are put forward can strengthen knowledge organization theory, because it may ultimately lead to an improvement of the intellectual access to scholarly literature.

What kind of work the various literatures are performing is determined by the socio-communicative activities and structures they are a part of. These activities and structures are maintained and shaped by the discursive and rhetorical means available. The literatures are a response to various genre-based activities such as putting forward knowledge claims or reviewing literature[2]. The various literatures are exactly the material space in which these means are expressed and they constitute the literatures in being literatures. Consequently, when trying to cope with subject literature and understand its role in scholarly communication, LIS theory can supplement its study of scholarly communication and scholarly literature by treating the latter

as literature. In the context of the present article this is meant literature with discursive and rhetorical functions.

The argument and structure

In order to provide an understanding of the various literatures involved in scholarly communication an epistemological interpretation of the work performed by those literatures shall be proposed in this article. Epistemology, or theory of knowledge, is among other things concerned with such issues as the nature of knowledge, the sources to knowledge and the validity of these in knowledge acquisition. Being the activity in which contributions to scholarly knowledge is proposed and evaluated scholarly communication can be seen as an enterprise embedded in epistemological issues and an explicit recognition of these seems necessary for LIS research areas on these matters. This has also recently been argued by Hjørland (2002, p. 268) when claiming that epistemology may serve as a general foundation for theories of, for instance, knowledge organization and IR.

In the present context the various literatures at play in scholarly communication can be considered as sources to knowledge. However, it will be argued that this epistemological dimension of scholarly literature cannot be understood without recognizing the discursive and rhetorical functions of it. These functions are necessary for the scholarly communicative act to take place and for making a public contribution to knowledge. That way it is subject literature and both its epistemological and communicative role in scholarly communication that will be dealt with in the following.

Thus, an epistemology of subject literature will, hopefully, illuminate the epistemological aspects of communicating scholarly knowledge through literature. By emphasizing these aspects it can be contemplated that such a communicative activity rests on an epistemological assumption fitting into the general social nature of the scholarly communication system. This can further contribute to an understanding of the various social factors at stake, when using literature as a means of communicating knowledge, as has also been done by Bazerman (1988) for instance. However, this is not to argue that scholarly knowledge is nothing but a pure social construction. Rather, it is to stress that social factors are an inherent, and at times necessary and acknowledged, part of knowledge production and that these social factors may contribute to knowledge and not only to error or ignorance, as is also argued by Bloor (1991) in his strong programme in the sociology of knowledge.

Moreover, in order to put forward knowledge claims, documents serve a function as instruments or tools in scholarly communication. That is, they are at the same time used to communicate with and the result of this communication. Thus, scholarly literature shapes and is shaped by the activity system (i.e. the scholarly communication system) they work within. Bishop (1999) demonstrated this when she studied how researchers disaggregated and reaggegrated documents in order to produce new ones.

The term “subject literature” will be applied in the following sense as literature produced by a certain knowledge domain dealing with a particular subject or subjects constituted by various genres expressed through many discourses. This conception of subject literature links it to the social activity of knowledge production. This seems reasonable when discussing subject literature and its function in scholarly communication.

The article is structured into three main sections. The first section will outline an epistemological position that pays particular attention to knowledge acquired through social interaction in general, and through interaction with written texts in particular. The works of Wittgenstein (1975) and Fleck (1979) will be used as the theoretical frameworks. Having established this epistemological framework, the second section will outline what is considered to be the main types of scholarly subject literature, with emphasis on their discursive and rhetorical functions in scholarly communication. The third section will synthesize the two other sections into a sketch of a theory that will be labeled the social epistemology of subject literature and point to some implications for LIS research of this theory.

Subject literature and its epistemological context

A lot of the knowledge humans possess is received through social interactions. Humans act in a world with pre-defined social structures which humans in turn also shape. In order to act appropriately according to their material circumstances, an understanding of the world is needed. But in order to get such an understanding one is also dependent on knowledge about the world. This knowledge is to a large extent obtained through social interaction (e.g. by the consultation of documents such as newspapers, books, journals and other media). This is why some scholars such as Wilson (1983) also have chosen to label this kind of knowledge as second-hand knowledge as opposed to knowledge gained first-hand (e.g. from perception or reason)[3].

When making use of subject literature in the production, distribution, and utilization of scholarly knowledge, the significance of social paths to knowledge is clearly emphasized. This is why the scholarly communication system usually is considered a social system and the production of scholarly knowledge a social activity (see Ziman, 1968). It is likely then to assume that an epistemology of subject literature must be of an equally social nature. Yet, there are of course, as argued by Hjørland (1998a, p. 28), many epistemological layers in scholarly communication:

An article in a journal can be written from one epistemology in a journal following principles inspired by a second epistemology. The same article can be indexed in a database influenced by a third epistemology, and used by a user interested in e.g. anorexia from a fourth epistemological point of view.

But this does not oppose the fact that when scholars communicate knowledge claims through literature they rest, rather implicitly though, on an assumption that they have to communicate their knowledge through some kind of writing; i.e. to publish some kind of document. Scholars recognize in this way the social

paths to knowledge. Otherwise they cannot claim to have produced a contribution to knowledge that other scholars can accept or reject. The document serves in this way as a testimony of a contribution to and a source of knowledge.

The epistemological position that studies and emphasizes social paths to knowledge and considers knowledge acquired through social interaction not necessarily or only a secondary epistemic source, as is usually done in traditional individualistic and fundamentalistic epistemologies like empiricism and rationalism, is social epistemology[4]. In LIS social epistemology is particularly known through the writings of Egan and Shera (1952). They argued for social epistemology in connection with the creation of a theory of bibliography and defined social epistemology as “... the analysis of the production, distribution and utilization of intellectual products” (Egan and Shera, 1952, pp. 133-4). Such an epistemology was needed, they argued, because “classical” epistemology was/is centered around “... the intellectual processes of the individual” (Egan and Shera, 1952, p. 132). As a consequence “classical” epistemology cannot come up with an answer as to what the social-epistemic function of knowledge in society (and in science and scholarship) is. However, Egan and Shera’s social epistemology never received that much attention in LIS (except for Wilson (1983) which is a dedicated work to this area). Recently, however, Warner (1993, 2001), among others, has revived social epistemology in connection with historical analyses of copyright acts viewed as public texts.

Today there seems to be two general approaches to social epistemology: a sociological and an analytic-philosophical. Despite their different forms of argument and emphasis, both approaches agree that emphasis is on knowledge that is socially rooted and socially determined and materialized in, for instance, documents or various institutionalized discourses. It examines how humans acquire knowledge from each other (i.e. received wisdom) through socio-communicative activities (e.g. testimony, argumentation, or education).

By focusing on social paths to knowledge, social epistemology recognizes and emphasizes that individuals are not epistemologically unique. Individuals must have other cognitive authorities than themselves. Humans acquire knowledge within socially structured settings. Humans are in other words dependent on others in order to have their knowledge claims certified or rejected.

One philosopher who has argued this way about knowledge production and acquisition is Wittgenstein (1975) in his epistemological work *On Certainty*. Wittgenstein polemizes against the philosopher Moore. Moore claims, when raising his hand in the air, that he knows that here is a hand. But according to Wittgenstein this cannot be a criterion of knowledge, because in what ways is it possible to reject the proposition, when Moore actually holds his hand in the air and states the proposition: “It is not a matter of Moore’s knowing that there’s a hand there, but rather we should not understand him if he were to say ‘Of course I may be wrong about this’. We should ask ‘What is it like to make such a mistake as that?’ e.g. what’s it like to discover that it was a mistake?”

(Wittgenstein, 1975, p. 32). According to Wittgenstein, therefore, to know is not the same as saying that one knows. It is not possible to conclude from one's own certainty to the facts (Wittgenstein, 1975, p. 30). To know is not an expression of some mental condition. Rather, one consults the outside social world in order to have a knowledge claim rejected or accepted, and one should have the possibility of doing this. Otherwise the knowledge claim would not make sense, as in Moore's case.

In science and scholarship the confirmation or rejection of knowledge claims happens through the social activity of writing (and reading). Fleck (1979) emphasized this epistemological-communicative view of scholarly literature in his book *Genesis and Development of a Scientific Fact*[5]. In here Fleck developed a notion of scholarly communication and scholarly literature that to a large extent can be said to account for a social epistemological interpretation of it. Fleck is very conscious about the significance of and reliance on the communication of knowledge through literature[6]. His concepts of thought collective, thought style, journal science, and vademecum (handbook) science can illuminate this social epistemological feature of scholarly communication.

Fleck (1979, p. 39) defines a thought collective as: "... a community of persons mutually exchanging ideas or maintaining intellectual interaction". Herein lies a clear emphasis of social paths to knowledge and the general recognition of science as a social activity. The structure of a thought collective consists further of a small esoteric circle and a larger exoteric circle. The esoteric circle comprises the specialized and general experts in a field, while the exoteric circle comprises "... the more or less educated amateurs" (Fleck, 1979, p. 111). While any individual belongs to several exoteric circles, not every individual belongs to an esoteric circle. The esoteric circle delivers the creation of thought and thus serves as a mediator between the creation of thought and the exoteric circle (Fleck, 1979, p. 105). This leads Fleck (1979, p. 105) to stress the reliance on and trusting cognitive authorities in the communication of scholarly knowledge:

Thus most of the members of the thought collective are related to the works produced by the thought style only through trusting the initiated. But the initiated are by no means independent. They are more or less dependent, whether consciously or subconsciously, upon "public opinion", that is, upon the opinion of the exoteric circle.

But not only does Fleck stress the matter of trust here, he also seems to point to the power of public opinion, the exoteric circle. Trust is not an inherent property of the initiated. The larger public ascribes it to them, because there is good reason to believe the initiated and because they form part of society's division of labor. He sees this as a relationship of the élite (the esoteric circle) to the masses (the exoteric circle), and stresses that "If the masses occupy a stronger position, a democratic tendency will be impressed upon this relation" (Fleck, 1979, p. 105). This democratic tendency is, according to Fleck, necessary for the thought collective and its development of ideas and progress. Otherwise it gets isolated from its social surroundings and "... secretiveness and dogmatism dominate the life of the thought collective" (Fleck, 1979, p. 106).

Thought style is defined by Fleck (1979, p. 99) as “... the readiness for directed perception, with corresponding mental and objective assimilation of what has been so perceived”. Thus, the manifestation of the thought style is what becomes visible in the scholarly literature. The thought collective determines what becomes visible here, because it is the communal carrier of the thought style (Fleck, 1979, p. 102).

Fleck’s concept of journal science can be said to correspond more or less to what in this article is designated primary literature (Fleck, 1979, pp. 118-24). According to Fleck journal science “... bears the imprint of the provisional and the personal ...” (Fleck, 1979, p. 118). It is provisional in the sense that knowledge claims put forward in journal articles are at the time of publication not to be considered a part of the intellectual capital of the thought collective yet. The topics or problems treated in a particular journal article must therefore in some way or another address topics or problems already known to the thought collective in order to obtain a possible acceptance. This explains why Fleck (1979, p. 98) can define a fact as “... a stylized signal of resistance in thinking”, and because the thought style is determined by the thought collective, a fact is then designated “... as the signal of resistance by the thought collective” (Fleck, 1979, p. 98). The personal aspect of journal science is present in the sense that it is, after all, the individual author who performs the experiments and writes an article. But again these actions are constrained and shaped by the thought style of the thought collective.

Fleck’s concept for literature synthesizing and consolidating primary literature is vademecum (or handbook) science (Fleck, 1979, p. 118). According to Fleck, the epistemological state of a discipline is to be read off in the vademecum, but because of the various points of view present in the primary literature it is not appropriate, or even possible, to conceive of the vademecum as a neutral accumulation of the content of journal articles:

The vademecum is [therefore] not simply the result of either a compilation or a collection of various journal contributions. The former is impossible because such papers often contradict each other. The latter does not yield a closed system, which is the goal of vademecum science. A vademecum is built up from individual contributions through *selection and orderly arrangement* like a mosaic from many colored stones. The plan according to which selection and arrangement are made will then provide the guidelines for future research. It governs the decision on what counts as a basic concept, what methods should be accepted, which research directions appear most promising, which scientists should be selected for prominent positions and which should simply be consigned to oblivion (Fleck, 1979, pp. 119-20; emphasis added).

Hence, Fleck ascribes to vademecum a certain power position. What a given thought collective knows, its thought constraint, is not open to discussion in vademecum science, unless a different thought style takes over. Further, to the extent a fact is meant as something fixed and proven, it does only exist in vademecum science (Fleck, 1979, p. 124). Journal articles have just sowed the seeds for a fact.

Fleck did operate with two additional types of literature working in the scientific thought collective (or socio-intellectual forms as he called them):

Popular science and textbook science, though he did not pay much attention to the latter. Textbook science is used, as opposed to popular science, for initiation into science.

Hence, in Fleck's view, the four types of literature characterizing the thought collective of science is an expression of its social organization of knowledge. Journal science and vademecum science constitute expert science and thus belong to the esoteric circle (Fleck, 1979, p. 112). Popular science belongs to the exoteric circle, while textbook science is a literary genre used for initiation into the esoteric circle. In this way these kinds of literatures are all performing epistemological and communicative tasks and interact with each other through their moves out of and into the esoteric and exoteric circles. That way Fleck was aware of the social epistemological dimensions of knowledge communication.

Interestingly enough though, Fleck did not pay attention to bibliographic literature, his awareness of the importance and significance of the dissemination of scholarly knowledge through the esoteric to exoteric circles taken into consideration. From a LIS point of view, however, it is not appropriate to exclude bibliographic literature, even though studies show that many scholars do not rely on bibliographic literature when searching for scholarly information. Most theories of, for instance, information seeking and use, knowledge organization, or bibliometric studies usually, or at least in part, do after all take this kind of literature as its point of departure. The following will elaborate on this and include bibliographic literature.

A coherent description of the various types of literatures, each performing particular tasks, involved in scholarly communication must attempt to take into account the epistemological and communicative division of labor of the various types of scholarly literature in-between. Social epistemology can in this way serve as the interpretative framework in which the abovementioned division of labor can be explained and understood.

Subject literature in a communication context

The means and modes of scholarly communication are very much of a highly textual nature. This is also stressed by Bazerman (1988, p. 22), when he states that: "... text production is the goal, and the activity cannot be understood without seeing the centrality of texts". Texts constitute the formalized social recorded discourses through which the communication of scholarly knowledge takes place.

In order to show the discursive and rhetorical functions of subject literature in a scholarly communication context, a typology of subject literature of the main kinds of literature used in this communicative activity can be made. The main kinds of literature used in written scholarly communication are primary, secondary, and tertiary literature[7]. That is, literatures that:

- contain new knowledge claims;
- register and describe knowledge for retrieval; and
- synthesize and consolidate.

This division of labor between the various literatures can of course be criticized for being too much of an idealization. Such a sharp division of labor it presupposes might not at all be present in scholarly communication. Consider the case of the review article. When does it stop being a review and begin being a primary article? Is it still to be considered a review article even though it actually has made a new contribution to knowledge? That is a question of genre. Therefore, when attempting to examine the work performed by the various literatures in scholarly communication, it seems defensible to construe such a division of labor, even though there always will be examples of exceptions to the rule. There are, after all, literatures out there performing tasks that can be put into the categories of primary, secondary, and tertiary literature[8].

Thus, through a typology of subject literature, the communicative and epistemological division of labor between primary, secondary, and tertiary literature can be shown. Thus, attention is paid to esoteric subject literature. Further, outlining the discourses of the various types of subject literature will help illuminate the social nature of communicating knowledge through literature. The following will examine how these types of literatures act in scholarly communication, and through studies that have been carried out show how this activity is shaped by discursive and rhetorical means.

Primary literature

Primary literature is the point of departure for the production of scholarly knowledge and, thus, also for the epistemological and communicative division of labor of subject literature. The task for primary literature is to produce and present new knowledge. The “proof” for this new knowledge happens through documentation of knowledge claims through the production and publication of a document. Thus, primary literature constitutes a subject field as a field of knowledge, and contains, ideally, the basic results and insights of a subject field (Hjørland, 1997, pp. 79-115).

Since the task is to produce and present new knowledge, the discourses in and the rhetoric of primary literature are of course of a varied and special nature. If it is the case that scholarly knowledge does not have the status as a contribution to knowledge before it is materialized and published in some kind of document, then this must have some discursive and rhetorical implications. To claim that one has produced new knowledge demands, following among others Bazerman (1988), that one is able to convince the anticipated audience that this is actually the case. This is in accordance with Fleck’s notion of the fact as a signal of resistance. Ziman (1968, pp. 120-1) also points this out: “A scientific paper is not to be validated on its own terms. Even after it has been refereed, the ‘information’ that it proffers is no better than the competence of the author and the consistency of his arguments and experiments. An inhuman style does not guarantee superhuman truth”. According to Bazerman (1988), this explains why there is a certain inescapable rhetorical element involved in knowledge production and demonstrates that the discursive and rhetorical

strategies used by the authors to gain acceptance of their knowledge claims are very different[9].

The way various subject fields organize and construct their knowledge claims within texts can reveal a lot about the epistemological view of the knowledge claimed to be produced in them. Bazerman (1988) exemplifies with the experimental article in science. This genre is structured around such obligatory textual elements as introduction, apparatus and materials, method(s), results, discussion, conclusion and references. These textual elements and their functions within the article have developed over time in response to changing epistemic conditions. Therefore, they are to be regarded as rhetorical structures rather than formal features.

Also by being present in the experimental article, these textual elements contribute to mirror an experimental situation being reported and reflect in this manner an empiricist epistemology. At the same time the presence of these obligatory textual elements in scholarly articles also demonstrates the social factors at stake in the communication of knowledge. Thereby Bazerman seems to be making the same point as Bloor (1991) does, when he stresses the inevitable social norms of experience:

These procedures declare that experience is admissible only in so far as it is repeatable, public, impersonal. That it is possible to locate experience that has this character is undeniable. That knowledge should be deemed to be crucially to this facet of our experience is, however, *a social norm* (Bloor, 1991, pp. 30-1; emphasis added).

Accordingly, even empiricism consists of a social nature.

In contrast to the experimental article, the scholarly monograph can, broadly speaking, be said to represent another epistemological view. This genre tends to be more historically oriented in its exposition of its theme and it does not have some of the obligatory textual elements as the experimental article does. The textual elements such as “apparatus and materials” and “results” are not typically contained in a scholarly monograph because of their connection with the experimental situation.

In this way, primary literature fulfills a social function developed to support and respond to particular communicative purposes. Furthermore, primary literature consists of social discourses, which by the use of language and rhetoric are carried on at one and the same time in it. This is not, however, to say that the knowledge produced cannot be objective. Rather, what is considered objective can be formulated in various ways by the use of various linguistic and rhetorical strategies.

Secondary literature

Secondary literature has to ensure bibliographical control and retrieval. It is secondary in the sense that it depends on prior written documents. Secondary literature analyzes, describes, and registers primary literature (mainly but not exclusively) in bibliographical instruments such as subject bibliographies, citation indexes, library catalogs, and databases.

Although not writing about secondary literature as such, Poster (1995, p. 85) has argued about databases that they are a discourse, a form of writing, because they effect a constitution of the subject (i.e. the individual). In much the same way it can be said of secondary literature that it effects a constitution of the primary literature registered when choosing which documents to include for description and how to describe them. This choice determines which documents can be retrieved and in what way they can be retrieved, and shows that the discourse of secondary literature is not of a neutral nature. But what is actually the discourse of secondary literature? What can be said about this discourse? Does it have a discourse at all?

The discourse going on in secondary literature is to a large extent expressed by the organization of knowledge taking place in it. That is, in terms of how the documents registered are described with regard to retrieval. The words and concepts used in indexing are but one expression of this discourse. Hjørland (1992) has argued in this connection that indexing, and knowledge organization in general, is of an epistemological nature. For instance, secondary literature using statistical and mathematical means of indexing can be interpreted to reflect an empiricist epistemology. This kind of indexing provides a different discourse than that based on, for instance, pragmatism. A pragmatic view would register and describe documents according what purposes and social functions they can be expected to fulfill. Different epistemological views of indexing thus have implications for what kinds of discourses are going on in secondary literature and how the documents registered can be retrieved. Consequently, these epistemological views have discursive and rhetorical implications.

Another aspect concerning the discourse in and rhetoric of secondary literature is the various subject access points a given document has (cf. Hjørland, 1998b; Hjørland and Kylllesbech Nielsen, 2000). How primary literatures are to be retrieved is dependent on how they can actually be approached when searching for them. This function is fulfilled by the subject access points. Those responsible for the organization of knowledge in the secondary literature determine what is searchable (e.g. title searching, keyword searching, citation searching). They will evaluate which access points are important in a given context, and through this affect how and in what ways a given document can be retrieved. The result of this evaluation is (in part at least) the document representation, which itself can be considered a text (cf. Andersen, 2000). Hence, access points also have a discursive and rhetorical role. Further, through the various access points, an ideology is also expressed in the discourse of secondary literature. An example of this is the citation indexes. They were developed in the first place as a means to optimize and improve subject retrieval. It was believed that the reference lists of primary documents could reveal something about the subject matter of the citing documents and about the semantic relationship between citing and cited documents.

The discourse of the bibliographical instruments is also examined by Wilson (1968). In order to be able to understand where in a given bibliographical

instrument a given document is to be found, and what it means that the particular document is in exactly this place and not another, Wilson (1968) operates with two theoretical kinds of bibliographical instruments:

- (1) the catalog; and
- (2) the bibliographical encyclopedia.

The catalog and the bibliographical encyclopedia have identical repertoires of places, each identified by the same ordinary words and phrases with their ordinary meanings.

However, the difference between these two is that the former is determined by a rule that requires determination of the subject of writing. The latter requires an estimation of the utility of a writing, or "...what 'serious study' it would contribute most to" (Wilson, 1968, p. 67). That is, what is to be found, for instance, under the label "Sociology" is different in these two kinds of bibliographical instruments. What is to be found in a given position is a question about language and meaning. A question of how words and concepts are used in the organization of knowledge: "... and we might also think of the available positions as resembling, not social positions, but social roles" (Wilson, 1968, p. 63). The meaning of a given social discourse in secondary literature is therefore dependent on the social context wherein the organization of knowledge is undertaken. In this way secondary literature, consisting of various discourses and rhetoric, is open for interpretation like any other kind of literature.

Tertiary literature

Tertiary literature consolidates, collects, and synthesizes the primary literature. Handbooks, encyclopedias, and review articles are examples of tertiary literature. Besides these formal characteristics one may ask, as Myers (1991, p. 45) does, what is it exactly that tertiary literature does in scholarly communication?

Woodward (1977, p. 176) has examined the various functions review literature can have in scholarly communication, and says that:

Very often a single review will serve many functions although ostensibly it has been written as primarily performing a single role, e.g. a brief survey of pertinent literature.

He then goes on to divide the discursive function of review literature in scholarly communication into two categories. The first category Woodward calls "the historical functions of reviews". This category is fundamental because it performs a critical evaluation of the published (primary) literature, and puts primary literature into a context. From this it is possible to gain an understanding of the primary documents forming the background for the review literature. Thus, "the historical functions of reviews" contribute to the epistemological state of a given subject field in terms of its synthesizing and review function in general, and corresponds in that way to Fleck's vademecum science.

The other category mentioned by Woodward (1977, p. 176) is “the contemporary functions of reviews”. Attention is paid to how review literature is being used or can be used by a given user. Review literature can, for instance, be used as a point of departure when searching for literature about a given topic, as a source for information about the quality of the literature being referred to in a review article, or as an access point to a subject area unknown to a given user.

Woodward illustrates, quite descriptively though, through these two categories the basic synthesizing function of tertiary literature in scholarly communication and its role in the organization of scholarly knowledge. He does not, however, pay attention to the fact that review articles may have an agenda on their own. Myers (1991) is one writer, who has examined this.

Myers (1991, p. 45) writes about review articles that “... the writer of a review shapes the literature of a field into a story in order to enlist the support of readers to continue that story”. He thus emphasizes that the way review articles create a review has to be seen in connection with the story they tell. According to Myers (1991, p. 46) review articles are stories with an open end, which is why it is necessary for the author of a review article to gain support among the readers to continue the story. In this way review articles do not contain a conclusion, which applies to tertiary literature in general.

In order for tertiary literature to fulfil its basic review function in scholarly communication it is of course necessary for there to be a certain amount of objectivity and reliability in the elaboration of tertiary literature. However, this can according to Myers (1991) happen in various ways. He examines two review articles from molecular biology treating the same topic in order to show this. Even though they treat the same topic the stylistic way of telling the story by the two authors is very different. Myers (1991, p. 47) gives an explanation to this phenomenon: “One reason for these differences in style is that the two writers are famous for different things and thus have different rhetorical problems”. In the same manner, as Bazerman (1988) does with primary literature, Myers stresses that the explanation of the diversity of the form and content of these review articles is of a rhetorical nature. This also implies, among other things, that these two review articles are cited in diverse contexts, which again reveals something about the reception of these two articles as review articles.

Myers’ (1991) analyses of tertiary literature, and indeed also Fleck’s concept of vademecum science, demonstrate that it is not just a rigid and neutral restructuring of primary literature. In the same way as with primary and secondary literatures, tertiary literature is a product of social epistemic conditions that affect its form and content, and thereby also its function in scholarly communication.

The synthesis: the social epistemology of subject literature

It has been argued and outlined above that the social epistemological function of the various literatures could not be understood without recognizing their

discursive and rhetorical functions. The dependence on other scholars when making a contribution to knowledge is enforced when taking the discursive and rhetorical aspects of subject literature into account. These are not developed for arguing a hidden agenda. Rather, the discursive and rhetorical aspects are a crucial part of communicating knowledge through literature. By doing that scholars have to respond to a situation where it is expected they will use a particular rhetoric and express that through an appropriate discourse using an appropriate genre.

Scholars are dependent on other scholars in order to have their knowledge claims put forward in documents certified or rejected. Otherwise they would not have any criteria other than their own subjective experience to validate their knowledge claims. This would, following Wittgenstein (1975), make it very hard, if not impossible, to establish evaluation criteria. If it were up to the single scholar, she would not be able to establish criteria of truth or falsehood, because she would not be able to differentiate between them. The typology of subject literature into primary, secondary, and tertiary literature illustrates how the acquisition and production of knowledge happens through a social activity (i.e. reading and writing). The certification or rejection happens through this formal written communication and demonstrates the social epistemological dimension of this activity. That is, it is recognized that the various types of literature in scholarly communication are in their own way and together sources to knowledge.

The various discursive and rhetorical functions of these three types of subject literature are an inherent part of the epistemological and communicative division of labor in scholarly communication. These types of subject literatures rely on and constitute each other through social interaction, and can be used to gain knowledge about each other. This shows that these functions can be conceived of to be of a social epistemological nature.

Secondary and tertiary literatures do not have any functional legitimacy without primary literature. On the other hand, primary literature is dependent on the work performed by secondary and tertiary literature. This preserves the visibility and dissemination of primary literature in the scholarly community and in a broader cultural community. In epistemological terms, primary literature is dependent on this in order to gain its cognitive authority, as argued by Fleck in terms of the function of vademecum science. This may be labeled the social epistemology of subject literature.

Thus, the way scholarly subject literature is divided into primary, secondary, tertiary literatures can be conceived of as an institutionalized social organization of knowledge. By establishing a social epistemology of subject literature a contribution has been made towards a sketch of a coherent theory of scholarly subject literature explaining the epistemological and communicative division of labor between the various types of subject literature. Such an explanation may supplement the development of IR techniques. It should be assumed that due to the diverse epistemological and communicative function of primary and tertiary literature, the retrieval techniques to be used

should accordingly be of a different nature, depending on the kind of literature to be used on. As for bibliometrics, the literatures examined in this article constitute the intertextual landscape for citation analyses. Citation analyses need to examine where the citations come from (e.g. from a primary or review article) in order to say something substantial about the role of citations as concept symbols (Small, 1978). An understanding of the discursive and rhetorical functions of the various literatures, as outlined above, in scholarly communication could serve as a sound point of departure.

Further, the journals registered in a given subject bibliography are themselves expressing a social organization of knowledge. The journals can be an expression of various theoretical approaches, which sometimes can be read off by their scopes and coverage. By merging the various journals into one single subject bibliography complicates the retrieval of articles contained within those journals. This is of course dependent on the discipline concerned. But the task left for knowledge organization is thus to try to express this epistemological difference among the various journals. Recognizing the epistemological and communicative division of labor of the various literatures can help accomplish this task. Moreover, in order to design IR systems for scholarly communities knowledge about how knowledge is produced discursively and rhetorically seems crucially because it reflects the social actions users and producers of scholarly knowledge are embedded in. The users and producers are *not* two different agents approaching the task of seeking and producing knowledge from different angles. They are part of an activity that uses various written genres in order to accomplish a common goal. The discursive and rhetorical means they have available are both a product of and a tool in this activity.

Thus, recognizing and treating the various literatures involved in scholarly communication as literature with discursive and rhetorical functions imply for LIS research that the interrelationship between form and content in scholarly communication become enforced. Social epistemology may serve as the epistemological framework in which to conceptualize form and content.

Notes

1. White and McCain (1998, p. 354) have actually put forward that LIS might be called literature science and Szavá-Kováts (2002) has recently advocated the same term for a LIS-approach to the study of scholarly literature.
2. Another genre-based activity in scholarly communication is oral communication. The discursive and rhetorical means do not of course only reveal themselves in written communication. Oral communication such as informal discussions (e.g. through e-mail) or conference presentations is also shaped by the discursive and rhetorical means available.
3. I am aware that Wilson's (1983) dichotomy between first-hand knowledge and second-hand knowledge may be controversial because there is a danger of signalling a non-social world and a social world for knowledge acquisition to take place. This is of course absurd. Obviously, knowledge acquisition (and production) takes places in a world which is nothing but social.

4. There are many schools within the field of social epistemology. In this article a broad and generalized view on social epistemology is taken. For a view of the many schools of thought within social epistemology the reader is referred to Egan and Shera (1952), Fuller (1991, 1996), a special issue of the journal *Synthese* (Schmitt, 1987) is devoted to the subject, Goldman (1999), Schmitt (1994), and issues examined in Wittgenstein (1975) might also be of interest in connection with social epistemology.
5. Thanks to Professor Charles Bazerman, Gevirtz Graduate School of Education, University of California, Santa Barbara, for making me aware of Ludwik Fleck's work and for his general inspiration.
6. This does not, for instance, seem to be the case with Fleck's successor, Thomas Kuhn, in his book *The Structure of Scientific Revolutions* (Kuhn, 1996). Kuhn only pays attention to the role of textbooks, and not the system of literatures at play, as Fleck does. See Brorson and Andersen (2001) for a discussion of Fleck's and Kuhn's views on scholarly literature and the role of it in their respective frameworks. However, Brorson and Andersen seem to confuse Fleck's concept of vademecum science with textbook science. Fleck (1979, p. 112) explicitly distinguishes between journal science and vademecum science, which together constitute expert science, and textbook science. Fleck says about textbook science that: "Because initiation into science is based on special methods of teaching, we must list textbook science as yet a fourth socio-intellectual form, which, however, is less important in our context" (Fleck, 1979, p. 112). But according to Brorson and Andersen (2001, p. 116), the goal of textbook science in Fleck's terms "... is to produce a closed system of knowledge from the various journal contributions" (Brorson and Andersen, 2001, p. 116). Here is where they are mistaken, because this is how Fleck talks about vademecum science: "The vademecum is [therefore] not simply the result of either a compilation or a collection of various journal contributions. The former is impossible because such papers often contradict each other. *The latter does not yield a closed system, which is the goal of vademecum science*" (Fleck, 1979, pp. 119-20; emphasis added). Brorson and Andersen (2001, p. 116) even cite this passage in favor of textbook science.
7. Excluded is what Hjørland (1998b, p. 616) calls source literature and "repackaged information" (e.g. popular science).
8. See e.g. Garcia (1995) for a comprehensive literary-philosophical analysis of the taxonomy of all kinds of texts.
9. Bazerman examines three articles by investigating how four types of contexts are referred to, invoked, or acted on in the articles. These four contexts are: the object under study; the literature of the field; the anticipated audience; and the author's own self (Bazerman, 1988, pp. 24-5). In examining articles from molecular biology, sociology and literary criticism respectively (i.e. articles representing the natural sciences, social sciences and the humanities).

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