



# Empiricism, rationalism and positivism in library and information science

Birger Hjørland

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

Accepted 6 October 2004

## Abstract

**Purpose** – The purpose of this paper is to examine the importance and influence of the epistemologies: “empiricism”, “rationalism” and “positivism” in library and information science (LIS).

**Design/methodology/approach** – First, outlines the historical development of these epistemologies, by discussing and identifying basic characteristics in them and by introducing the criticism that has been raised against these views. Second, their importance for and influence in LIS have been examined.

**Findings** – The findings of this paper are that it is not a trivial matter to define those epistemologies and to characterise their influence. Many different interpretations exist and there is no consensus regarding current influence of positivism in LIS. Arguments are put forward that empiricism and positivism are still dominant within LIS and specific examples of the influence on positivism in LIS are provided. A specific analysis is made of the empiricist view of information seeking and it is shown that empiricism may be regarded as a normative theory of information seeking and knowledge organisation.

**Originality/value** – The paper discusses basic theoretical issues that are important for the further development of LIS as a scholarly field.

**Keywords** Epistemology, Libraries, Information science, Philosophy

**Paper type** Conceptual paper

## 1. Introduction

Empiricism is the view that experiences, observations or sense data are the only or the most important way of acquiring knowledge. Rationalism is the view that rational intuitions are the most important way of acquiring knowledge. Positivism is today mostly regarded as a form of empiricism, but historically this is not the case. Logical positivism was a twentieth century attempt to combine empiricism and rationalism. In the social sciences and in library and information science (LIS) positivism has been associated with the question concerning the relative values of scientific versus humanistic approaches, although it is wrong just to associate positivism with scientific methods or interpretative methods with the humanities.

Empiricism, rationalism and positivism are important concepts in the philosophy of science and thus also in all specific sciences including LIS. They are often interpreted differently and considerable variations exist in descriptions of their nature and their influence in LIS. This is the reason this paper takes a deeper look at these concepts and their meaning in general as well as in a LIS context.

One misunderstanding is the confusion of empiricism with empirical studies. Empiricism and positivism do not have a monopoly on empirical studies, but represent specific views on how studies should be done. The concepts of empiricism, rationalism



---

and positivism are important for LIS in two ways: they are important for how library and information researchers approach their objects of research (e.g. by preferring quantitative or qualitative research methods). Much more important is, however, their importance for how those objects themselves are constituted.

A large part of the paper is devoted to a presentation of the paradoxical relation between empiricism and the use of literature as sources of information (a motto of empiricism is "read nature not books"). Empiricism thus implies a normative theory of information needs and use, a fact that has been overlooked in LIS. This is but one example of the close relations between substantial theories in LIS on the one hand and epistemologies like empiricism, rationalism and positivism on the other. Based on the theoretical clarification in the first part the paper of what empiricism, rationalism and positivism mean and of the criticism raised against these positions, the final part of the paper addresses selected present-day research problems in LIS, which are shown to be closely associated with positivism: inter-indexer consistency studies and relevance research.

## 2. Historical sketch

Questions concerning the nature of knowledge and inquiry go far back in civilisation, and names like Plato (429-347 BC) and Aristotle (384-322 BC) are important for distinguishing between different approaches such as rationalism and empiricism. Plato emphasised logical intuition, while Aristotle, to a much larger extent, emphasised empirical investigations.

The scientific revolution of the seventeenth century may be seen as an important milestone, a growing opposition to mysticism and the belief in supernatural ways of being informed. During that period the scientific experiment came to occupy a dominating role in science. The scientific method(s) also substituted the belief that some authorities should be believed without critical examination. A popular interpretation of the scientific revolution and the scientific method is that it is based on observations as the sole method in science (i.e. empiricism). This view of scientific methods is, however, not without problems and has never been universally accepted. Classical rationalists rejected the importance of observations in research and maintained that all observations presuppose clear concepts that cannot be empirically derived. Philosophers and scientists have been and are still divided regarding their view of observations and experiences in science. Modern empiricism developed like classical rationalism from different ways of drawing epistemological lessons from the scientific revolution consummated by Newton. Together, rationalism and empiricism constitute the two main tendencies of European philosophy in the period between scholasticism and Kant. Empiricism has been connected to British thinking, Rationalism to Continental thought (see Garrett and Barbanell, 1997, p. ix).

Classical British empiricists were John Locke (1632-1704), George Berkeley (1685-1753), David Hume (1711-1776) and John Stuart Mill (1806-1873), among others. In the twentieth century they were followed by figures like Bertrand Russell and the logical empiricists[1]. The empiricists are mutually very different and therefore the term empiricism itself is somewhat loose, which is the reason why some philosophers believe that it is not a meaningful or fruitful concept.

Classical continental rationalists were René Descartes (1596-1650), Benedict de Spinoza (1632-1677) and Gottfried Wilhelm Leibniz (1646-1716). In the twentieth

---

century rationalism has been represented by logical positivism, which may be seen as an attempt to combine empiricism and rationalism. According to Smith (1986, p. 64):

logical positivism arose as the joint product of two intellectual traditions that conflicted deeply with one another: In attempting to unite these traditions, its adherents created an extremely influential approach to philosophy but one that embodied serious intellectual tensions from its dual ancestry.

---

Logical positivism lost influence during the 1950s and 1960s. Rationalism, however, regained influence by the so-called cognitive revolution. One of the most influential cognitive scientists, Noam Chomsky (born 1928), explicitly subscribed to this tradition and mentioned René Descartes among his intellectual ancestors.

Positivism was given its distinctive features as a philosophical ideology and movement by the French philosopher August Comte (1798-1857). He influenced John Stuart Mill in England, but French and English positivism developed somewhat differently. Most important is that the British empiricist tradition was explicitly not accepted by Comte[2]. Positivism also gave rise to movements such as Empiricriticism, which was criticised by Marxists such as Lenin (1947).

Logical positivism originated in Austria and Germany in the 1920s. Inspired by late nineteenth- and early twentieth-century revolutions in logic, mathematics and mathematical physics, it aimed to create a similarly revolutionary scientific philosophy. Its most important representatives were members of the Vienna Circle, who gathered around Moritz Schlick at the University of Vienna. Although not officially members of the group, the Austrian philosophers Ludwig Wittgenstein and Karl Popper were closely associated with logical positivism. It gave rise to an influential approach to philosophy known as “analytical philosophy”. Its influence began to wane around 1960, with the rise of a pragmatic form of naturalism due to Quine and a historical-sociological approach to the philosophy of science due mainly to Thomas Kuhn (1922-1996).

Two major figures in the philosophy of science in the twentieth century were Karl Popper (1902-1994) and Thomas Kuhn. They both explicitly criticised central claims in empiricism and positivism. Popper denied inductionism, the belief that one can accumulate observations and infer universal principles from such a basis. In opposition to empiricism and positivism he maintained that scientific hypotheses and theories are just conjunctions and that scientific process and method consist in falsifying such conjunctions. The theories that best survive such attempts of falsification are the best theories. In spite of Popper’s denial of his being a positivist, he was often considered to be just that, e.g. in the German *Positivismusstreit* mentioned below. A main argument has been that Popper’s falsificationism presupposes the same kind of theory-neutrality as does positivist inductionism.

Thomas Kuhn published his famous book *The Structure of Scientific Revolutions* (Kuhn, 1962) as the last book in a series, *The International Encyclopedia of Unified Science*, issued and edited by the logical positivists. Kuhn also denied that scientific progress should be seen as an accumulation of facts. He emphasised how the research process is influenced by factors which may be articulated or unarticulated, and which may be termed “paradigms”. Kuhn (1962) may be seen as an hermeneutic interpretation of the sciences because he perceives scientists as governed by assumptions which are historically embedded and linguistically mediated activities organised around paradigms that direct the conceptualisation and investigation of

---

their studies. Scientific revolutions imply that one paradigm replaces another and introduces a new set of theories, approaches and definitions. According to Mallery *et al.* (1992) the notion of a paradigm-centred scientific community is analogous to Gadamer's notion of a linguistically encoded social tradition. In this way hermeneutics challenges the positivist view that science can cumulate objective facts. Observations are always made on the background of theoretical assumptions: they are theory dependent.

In the 1960s a major controversy known as *der Positivismusstreit* (the positivist dispute) took place in Germany (see Adorno *et al.*, 1976). The critics were mainly inspired by versions of critical theory. Similar controversies became internationally influential during the following decades (with a considerable delay in the English-speaking world[3]). During the twentieth century positivism was also challenged by other movements such as pragmatism, hermeneutics, phenomenology and social constructivism (and, especially in the former Soviet Union, by versions of Marxism). Today the great divide is not so much between empiricism and rationalism. Now these traditions seem much more alike in their faith in neutral observations and deductions. They are opposed to traditions like hermeneutics, historicism, pragmatism and postmodernism, which emphasise the cultural influence, interests and theory-laden nature of knowledge.

At the beginning of the twenty-first century not many theorists defend positivism any longer, which does not imply, however, that the positivist way of thinking is not still influential as a kind of naïve or silent philosophy (positivism has been termed the “invisible philosophy of science”). Another reason why positivism may still be influential is that no alternatives have yet been able to establish a strong position in the practical guidance of research processes and that the different philosophies and metatheories have a somewhat unclear status: They have not been confronted and described in ways that make it obvious what positions different labels are supposed to cover and what specific claims are at stake in the different theoretical positions. There is a considerable lack of clear terminology in the philosophy of science. In spite of this it must be stated that important progress has been made and that courses in the philosophy of science in different fields are able to improve the reflectivity and the quality of research and learning.

### 3. Defining characteristics

Terms like empiricism, rationalism and positivism have many meanings in the history of science and philosophy (not least from different theoretical perspectives). Almost any important philosopher tends to use such terms differently. Some historians deny that it is meaningful to cover such differences under the same label. As is the case with all other terms, their meaning should be defined in relation to the functions they are supposed to serve in speech acts: How we define terms like empiricism, rationalism and positivism is thus not just given by the history of philosophy, but is partly determined by our attempts to understand and improve contemporary research processes. In this process we try to learn from past experiences and to make generalisations of these experiences. Many principles that are important at the time of their publication may thus be less important from a present-day perspective or from the perspective of developing epistemological principles for information science. For example, positivism may have developed in opposition to religious ways of thinking which is regarded as

common sense today, and so this aspect of positivism is not important in distinguishing positivism from other present-day epistemologies. Another example is that hermeneutic philosophers were often sceptical of western science. That issue is perhaps less relevant if we want to learn how hermeneutic insights might be useful in the development of science. In defining terms like empiricism, rationalism and positivism we are thus applying the pragmatic principle of looking into the future rather than just mechanically seeking the meaning in the past.

### *3.1. Empiricism*

Empiricism is the epistemological standpoint that observations and (sensory) experiences should be regarded the most important or only method to gain knowledge and that all controversies should ideally be reduced to claims that can be verified by observations:

It is obvious that not all knowledge stems directly from experience. Hence empiricism always assumes a stratified form, in which the lowest level issues directly from experience, and higher levels are based on lower levels. It has most commonly been thought by empiricists that beliefs at the lowest level simply “read off” what is presented in experience. If a tree is visually presented to me as green I simply “register” this appearance in forming the belief that the tree is green. Most of our beliefs – general beliefs for example – do not have this status but, according to empiricism, are supported by other beliefs in ways that eventually trace back to experience. Thus the belief that maple trees are bare in winter is supported by particular perceptual beliefs to the effect that this maple tree is bare and it is winter (Alston, 1998).

The consistent development of this view during the history of philosophy has led to a comprehensive number of assumptions about the world (ontology), about the mind (psychology), about concepts and languages etc., which form the basis of the empiricist point of view. For example, the view that a newborn human being has no knowledge (“*tabula rasa*”), that complex concepts are created in the mind by the combinations of simpler concepts corresponding to simple sensations and that learning processes are governed by laws of association, etc.

For the logical positivist Rudolf Carnap (1891-1970) empiricism is the doctrine that the terms and sentences that express assertions about the world are “reducible” in a clearly specifiable sense to terms and sentences describing the immediate data of experience. In practice empiricist epistemologies are searching for simple observations, which any observer can agree on (i.e. intersubjectivity). The scientific process is viewed as the collecting of verified observations and as generalizing from such a collection by induction. The basic methods of empiricism are thus observation and induction. Empiricism is based on a “bottom-up” strategy in the processing of information.

The basic assumption to which other epistemologies are in strong opposition is that sensations and experiences are regarded as “given”, that what we see (or what we describe as our experiences) is independent of our theories, conceptualisations, culture and political interests: that controversies concerning knowledge claims can be solved just by looking at realities.

### *3.2. Rationalism*

In its extreme form rationalism is a position that does not recognise the role of experiences. Sense perceptions may be illusory, and it is not even possible to say that

---

something is of the colour red if you are not in possession of a system of concepts, including colour concepts. Such concepts cannot be given by experience, but are a precondition for any experience. The most important knowledge is thus given a priori. The model science for rationalism was geometry. Geometry was the example that demonstrated that it is possible to build a whole science without making any observations[4]. The method favoured by rationalism is to reduce any problem to what cannot be questioned: to evident statements. From here evident statements may be combined and new knowledge may be deduced. Rationalism tends to use a “top-down” analysis in the processing of information, i.e. to approach a given set of data from some preestablished categories[5].

Moderate versions of rationalism do acknowledge the role of observations. They share with empiricism the view that observations are chemical-physical stimulations of sense organs. While empiricism looks at our concepts as formed by sensory stimulation, rationalism looks at our concepts as inborn structures, which match and classify our perceptions.

In all its forms rationalism is an epistemology that emphasises the role of conceptual clarity and evidence and which prefers deductive methods rather than inductive methods.

Karl Popper named his philosophy “critical rationalism”. He strongly attacked inductive methods and the view that statements can be verified in the way by which they were understood by empiricists. Instead he proposed that scientists should formulate brave conjunctions, which should be submitted to strong tests in order to be falsified. This idea is rationalist in the sense that the logical implications of the conjunctions are deduced. The deduced implications are then tested. This is the basis of the hypothetical-deductive method. An important principle stated by Popper is the importance of principal falsifiability. It is important that all researchers state their hypothesis in a clear way, which makes it possible to deduce their empirical consequences and to test them empirically.

Rationalism shares with empiricism the views that knowledge has a certain foundation, that the methods of getting knowledge are independent of the concepts, theories and points of view of the researcher. Classical rationalism assumed that there existed a certain order in the universe that could be discovered and mapped by human knowledge in a way that was not relative to specific points of view. For Popper’s falsificationism it is a presumption that researchers observations are not theory-laden when theories are tested (so that different traditions would test the same way).

### 3.3. *Positivism*

Kincaid (1998) summarises positivism the following way:

Positivism originated from separate movements in nineteenth-century social science and early twentieth-century philosophy. Key positivist ideas were that philosophy should be scientific, that metaphysical speculations are meaningless, that there is a universal and a priori scientific method, that a main function of philosophy is to analyse that method, that this basic scientific method is the same in both the natural and social sciences, that the various sciences should be reducible to physics, and that the theoretical parts of good science must be translatable into statements about observations. In the social sciences and the philosophy of the social sciences, positivism has supported the emphasis on quantitative data and precisely formulated theories, the doctrines of behaviourism, operationalism and methodological individualism, the doubts among philosophers that meaning and



---

interpretation can be scientifically adequate, and an approach to the philosophy of social science that focuses on conceptual analysis rather than on the actual practice of social research. Influential criticisms have denied that scientific method is a priori or universal, that theories can or must be translatable into observational terms, and that reduction to physics is the way to unify the sciences. These criticisms have undercut the motivations for behaviourism and methodological individualism in the social sciences. They have also led many to conclude, somewhat implausibly, that any standards of good social science are merely matters of rhetorical persuasion and social convention.

He also states that the positivists often did not agree which doctrines were essential to their position or how those ideas should be interpreted, and the term “positivism” has come to stand for a set of ideas that some positivists would not have fully endorsed.

Positivism has been an extremely influential tendency, not only in research, but also in other areas of society. Even today the Brazilian flag has the inscription “*Ordem e Progresso*” (order and progress), the motto of positivism (see Mueller, 2003).

Today the word positivism is often used synonymously with empiricism as a point of view that neglects the theoretical work of researchers. This is not, however, in accordance with much classical positivism. We have already seen that Auguste Comte disagreed with this view[6]. Turner (1993) has also realised that Comte has been misinterpreted and wrote: “Comte Would Turn Over in His Grave” if he was confronted with the present-day understanding of positivism, and he demonstrates that Comte’s “positive science” clearly and explicitly included a central role for theory and that Comte dismissed as unscientific the kind of empirical research that is conducted in the absence of theory.

It is important to realise that positivism is not the use of quantitative methods. This can be seen because Pierre Bourdieu, for example, uses statistics as the basis of his investigations, but he explicitly declares that he is not a positivist. Also, positivism is not the view of the natural sciences, which can be seen from the fact that positivism is also discussed in physics (e.g. in the debates between Albert Einstein and Niels Bohr). It is much more difficult to say what positivism is. Kolakowski (1968) provided an important analysis and proposed that positivism should be characterised by four criteria:

- (1) the rule of phenomenalism (there is no real difference between “essence” and “phenomenon”);
- (2) the rule of nominalism (insights formulated as general laws can only have individual concrete objects as real referents);
- (3) the rule that denies cognitive value to value judgements and normative statements; and
- (4) the rule (or belief) that there is an essential unity of scientific method (downgrading the differences between different domains).

While it is often stated that positivism is anti-metaphysical, it is perhaps more important today that positivist-inspired researchers are reluctant to consider how both their own views and those of their objects are influenced by theoretical and cultural issues. Positivism in music, law and other fields tends to isolate the phenomena (e.g. music and law) from other cultural phenomena and to inscribe the objects in a history that is independent of broader cultural issues (thus assuming autonomy to their fields of study).

---

### 3.4. Logical positivism (LP)

The logical positivists argued that sensory knowledge is the most certain kind of knowledge and so any concept not directly concerning sensory experience should be “translatable” into observational concepts. Those concepts that cannot be so translated are seen as meaningless. This claim led to a dualist view of science: an observational and a theoretical part. They combined a rationalist and an empiricist view by demanding a distinct separation between formal and empirical components in science. The previous metaphysical opposition of rationalism and empiricism was transformed into a linguistic distinction between analytic and synthetic truths.

The logical positivists attacked metaphysics by bringing in the empiricist tradition. LP is thus closer to empiricism than was classical positivism. LP differed, however, in one important way from the empiricist tradition. While the empiricist tradition is psychological, LP was anti-psychological. Where Hume and other classical empiricists[7] were based on psychologism, LP tried to change the basis of science. “It is *the method of logical analysis* that essentially distinguishes recent empiricism and positivism from the earlier version that was more biological-psychological in its orientation” (from a 1929 manifesto from the Vienna Circle, here quoted from Smith, 1986, pp. 41-2). Whereas earlier forms of empiricism had emphasised the importance of perception, LP concerned itself primarily with knowledge in its linguistic and logical aspects. They gave empiricism a “linguistic turn”.

The logical trust, they [LP] believed, complemented the empiricist view of knowledge and made possible a resolution of the age-old opposition of rationalism and empiricism. The complementarity of logic and empiricism in the logical positivist’s thought was manifested in their endorsement of a strong distinction between analytical and synthetic propositions. It was also revealed in their three-way classification of sentences into logical claims, empirical claims, and nonsensical utterances. According to them, there could be no meaningful discourse outside the realm of logic and science (Smith, 1986, p. 28).

Another well-known concept from LP is that of “protocol” sentences. At one time the idea was that science should advance by the accumulation of sentences referring to single, clear observations such as “the instrument showed 22.5 degrees”.

From these ideas LP drew several conclusions: since scientific knowledge came from applying an a priori logic of science, good science must be value free. The logical positivists also promoted the view that the unity of the different sciences was an important goal. They thought there was one scientific method common to all the sciences, including the social sciences. They also thought that the different sciences could and should be unified by being reduced to physics, that mental phenomena should be translated into behavioural phenomena, which can be studied like other physical phenomena by movements in space and time:

Both Frege and the logical positivists after him recognised that in seeking a precise yet general language for the expression of ideas they were revitalizing a tradition begun by Leibniz. In his work on logic, Leibniz had enunciated the goal of developing an ideal language, one capable of expressing facts and inferences with such clarity and accuracy that all of human reasoning could be carried out by straight-forward calculations within that language. Not only would such a language form a basis for the unity of science but it would permit the settlement of all disputes by mere calculation (Smith, 1986, p. 30).



---

LP was thus an attempt to unite previous traditions within empiricism and rationalism. In many ways LP was a more extreme position than former kinds of empiricism and positivism in that observations are not only important, but the sole criterion for meaning.

According to Svenonius (2004, p. 572) operationalism is a theory of meaning emanating from LP:

To define a concept operationally often means defining it as a variable. Defining concepts as variables enables a discipline to advance.

Later on:

Propositions that express relationships among variables are “scientific” in the sense that they take the form of generalisations and serve an exemplary function: if verified, they assume the character of laws; if awaiting verification, they have the status of hypotheses (Svenonius, 2004, p. 572)[8].

A deeper description of the influence of LP is provided by Kincaid (1998):

Much social research uses statistical methods to test hypotheses and implicitly treats statistical inference as a mechanical, purely logical process. Social research also often reports only correlations between variables, drawing no conclusions about causes. Both practices have positivist origins. The early developers of modern statistics were sympathetic to positivism, and interpreted their results as a concrete implementation of the positivists’ a priori scientific method or logic of science. The refusal to draw causal conclusions comes in part from the positivist rejection of metaphysics, for many positivists thought causation an obscure metaphysical concept that should be rejected in favour of lawful regularities between observables.

Operationalism as a way of defining concepts was soon given up in physics and even though it has had a longer life in the social sciences, it is a problematic theory[9]. A relevant description of the influence of LP on measurement is perhaps the tendency to focus on intersubjective phenomena in LP thus avoiding studies that are based on theory-laden concepts. Olaisen (1996) expresses his view on positivism as “trivialism”. The idea is that if researchers focus on studying or measuring things that everybody can agree on, there is very little room for interpretation and theory, and so such research tends to accumulate lots of trivial findings without important perspectives. This may be in accordance with what Svenonius expresses.

Positivist approaches are often confronted with interpretationist approaches in the social sciences. Arguments that any social science dealing with meanings is scientifically inadequate have positivist roots. W.V. Quine, for example, argued that linguistic meaning is inherently indeterminate and thus scientifically suspect because we cannot capture meanings in observational or physical terms. Related doubts about a science of meaning turn on the fact that meanings involve intentionality – substituting terms with equivalent meanings does not always preserve the truth-value of statements. This makes it difficult to turn social science theories into axiomatic formal systems, a requirement for good science again inherited from the positivists.

An implication of the LP theory was the claim that the sciences form a hierarchy, with sociology reducible to psychology, psychology to biology, and biology to physics. These reductions were to show that the laws and theories of each science were

---

derivable from or special cases of the science “below” it. This claim is obviously of interest to the field of knowledge organisation in information science.

The principles of LP may be summarised in the following way (based on Haakonsen, 1973, pp. 8-9):

- All human knowledge can be formulated in languages. There exist no background knowledge that cannot be formulated.
- Thus knowledge can be reduced to private immediate experiences. Or, rather, it may be reduced to so-called “elementary sentences”, which are verbal reports about immediate experience. This relation may also be expressed reversed: All knowledge is constructed from verbal reports about immediate experience.
- The reduction/construction is aided by principles uncovered by modern symbolic logic.
- All speech, which cannot be reduced to elementary sentences, is meaningless because the meaning of any sentence is the method by which it may be verified. If we do not know under which circumstances a sentence is true or false, our speech is baseless. This is the so-called criterion of verification-ability of meaning.
- It is possible to decide definitively whether or not the remaining meaningful speech is true or false. It is true (“verified”) when the elementary sentences to which it can be reduced are corresponding to the ascertained reality. If not it is false (“falsified”). In other words: It is possible to solve all problems definitively.
- Only the knowledge of the sciences can be verified. The sciences represent thus the only existing kind of knowledge.

Positivist assumptions are today often contrasted with interpretivist assumptions such as displayed in the Table I.

An important feature in Table I is that it shows how a positivist philosophy does not only imply researchers’ selection of research methods, but it also has much broader implications concerning world-view, view of the objects under investigation, view of meaning and the human mind, etc. An important issue is, however, that positivism is not a realist philosophy as indicated in the table (nor are interpretative approaches necessarily antirealist). This seems to be a widespread misunderstanding, but it is important to realise that positivism is an anti-realist position (or at best a naïve-realist position). As Kincaid (1998) wrote in the quotation above: positivists refuse to draw causal conclusions in favour of lawful regularities between observables. This is one reason why realism is also important to consider as a philosophy of science (see also Hjørland, 2004a).

#### **4. Do empirical studies imply empiricism?**

While classical rationalism maintained that science should be built on rational intuition as the sole or main method of research (having geometry as the model science), few people today would deny that research in most cases need to be empirically informed in one way or another. It is important to realise that the debate concerning empiricism should not be confused with the question of whether to do empirical research. The important issues in epistemology today are mostly related to how to do empirical research, what kinds of ideals and methods one should prefer. Different epistemologies

Metatheoretical assumptions about	Positivism	Interpretivism
Ontology	Person (researcher) and reality are separate	Person (researcher) and reality are inseparable (life-world)
Epistemology	Objective reality exists beyond the human mind	Knowledge of the world is intentionally constituted through a person's lived experience
Research object	Research object has inherent qualities that exist independently of the researcher	Research object is interpreted in light of meaning structure of person's (researcher's) lived experience
Method	Statistics, content analysis	Hermeneutics, phenomenology, etc.
Theory of truth	Correspondence theory of truth: one-to-one mapping between research statements and reality	Truth as intentional fulfilment: interpretations of research object match lived experience of object
Validity	Certainty: data truly measure reality	Defensible knowledge claims
Reliability	Replicability: research results can be reproduced	Interpretive awareness: researchers recognise and address implications of their subjectivity

**Table I.**  
Alleged differences  
between positivism and  
interpretivism

**Note:** Reprinted by permission from both Sandberg and Weber  
**Source:** Class notes originating from Jørgen Sandberg. Published in Weber (2004, p. iv)

have different answers. Empiricism too has specific answers to this question, which differ from those of other epistemologies such as social constructivism or hermeneutics.

In empiricism and positivism the methodological ideals of research are concerned with the obtaining of facts, i.e. observations that all observers can agree on (i.e. inter-subjectivity). It is the ideal to check for the researchers' influence on the results (e.g. by applying double blind experiments). One might say that the reduction of the researchers' individual subjectivity is the ideal. This ideal is based on the assumptions that observations (or descriptions of observations) are neutral, that they are not influenced by the researchers' knowledge, views, sex and culture. It is also based on a specific cognitive theory according to which perception is seen as a neutral "reading" and concepts are labels associated with perceptual images (empiricism thus also implies a specific psychological and cognitive theory).

In psychology (and in user-studies in information science), a dominant form of empiricism/positivism has been behaviourism. This is a view that implies that users are responding to stimuli in mechanical ways following universal laws that are common for all human beings (or even for higher animals or for all animals). Empiricism and behaviourism are thus views that tend to neglect the role of culture and language in cognitive processes, (a view they share with rationalism and most so-called cognitive sciences). The implication for empirical studies is, of course, that a study of one population of users is seen as representative of users in general (and that systematic studies of differences between different user groups are relatively neglected).

---

In rationalism the methodological ideals are concerned with a logical “modelling” of data (or logical models which can be used to confront empirical reality). Noam Chomsky is an important modern representative of rationalism. It is characteristic that he distinguishes between the empirically given languages on one hand and a theoretical model of language which is supposed to be universal and related to inborn cognitive mechanisms on the other. There are many empirical studies in this tradition, but they are based on quite different assumptions than studies in the empiricist tradition.

In 2003 a special issue of *Knowledge Organization* on domain analysis containing several empirical studies (and some non-empirical papers) was published. Perhaps the most traditional empiricist study was that authored by Zins and Guttman (2003), while the paper by Ørom (2003) is an investigation that is based on a historicist-materialist paradigm that is very different from empiricism. Ørom’s study identifies patterns in classification systems and literatures that are not empirically derived in the same study but are derived from historical and philosophical studies of a more general nature. Studies of this kind are only possible when the researcher has a both deep and broad knowledge of the domain he or she is investigating. This kind of time-consuming studies of literatures tends to be ignored in more empiricist and positivist traditions.

### 5. Empiricism’s relation to literature and libraries (“read nature not books”)

In this section, I will try to demonstrate that empiricism from its beginning to now has had a very ambiguous relation to literature and libraries. It may imply anti-intellectualism, a philosophy that is hostile or at best ambivalent towards literature (while, on the other hand, empiricists write literature themselves). This attitude may be traced back to Francis Bacon:

Bacon presents an elaborate view of a new world of knowledge produced and displayed in the service of the state in the *New Atlantis* . . . A complex scientific infrastructure is described in the *New Atlantis* to support experimentation, “dissection and trials,” that will extend our knowledge of nature and the physical human body (p. 159). There are salt and freshwater lakes, gardens, and menageries, but there are also laboratories devoted to the study of phenomena related to the senses of sight, hearing, smell as well as observatories, animal experiment laboratories, and engineering and instrument workshops. And of course there are to be cabinets of curiosities, museums, to contain rare, beautiful, and strange things. What we would call meteorology, cosmography, medicine, genetics, geology, chemistry, and agriculture are among the subjects identified for study.

The one thing that is not to be found on the island of Bensalem or in the House of Salomon is a library! (Rayward, 2004, p. 119).

Another main figure in the history of empiricism wrote:

When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask, “Does it contain any abstract reasoning concerning quantity or number?” No. “Does it contain any experimental reasoning concerning matter of fact and existence?” No. Commit it then to the flames: for it can contain nothing but sophistry and illusion (Hume, 1758, Section XII, part 3).

Wittgenstein (1922) published his extremely influential book *Tractatus Logico-philosophicus* in 1922, which was an attack on all metaphysics. At the same

time Wittgenstein recognised that this book was itself a purely metaphysical text! According to its own criteria, it thus should not have been written[10]!

The psychologist B.F. Skinner was a striking empiricist. He wrote about his relation to literature: “I do not often read my critics”. Later on same page he continues:

Three Baconian principles have characterised my professional life. I have studied nature not books. As Bacon put it, “Books must follow sciences, not sciences books”. The world of my childhood taught me to build things – toys, gadgets, shacks, and eventually apparatus. I have read for pleasure but less often to learn, and I am poorly read in psychology – that is one of the ways in which I “neglect my contemporaries.” My experiments came out of other experiments, not out of theories. My books were written out of nature, not out of other books (Skinner, 1983, p. 28).

The above examples have all demonstrated a paradox in empiricism’s relation to literature. On the one hand their epistemological ideals do not permit them to use literature as sources of information. On the hand they find it necessary to write and to use literature. We may go a little deeper into this question by asking: Given that it is unavoidable to use literature as a source of knowledge, in which way will the empiricist ideals influence the way literature should be used? (And thus indirectly also how it is used?)[11]. In my opinion, the recent “evidence-based” movement may be interpreted as an empiricist view of the role of literature in knowledge utilisation. This movement is especially visible in medicine and is known as “evidence-based medicine”. It has also influenced other fields, for example psychology and nursing (and even has a weak voice in LIS (see Eldredge, 2000)). What this trend is demanding is that all professional decisions are based on documented evidence. This demand sounds reasonable, even common sense. The question has, however, been asked: If evidence-based medicine is a new trend within medicine, “what on earth was medicine based on before?” (Worrall, 2002, p. 316). Would not anybody demand that professional decisions should be based on evidence? Further reflection on this problem indicates that either “evidence-based medicine” is a common set of epistemological assumptions among all actors (implying consensus) or it is a specific epistemology that in certain ways is opposed to other epistemologies. It has both tendencies, as also revealed by the controversies it has created (see Fox, 2000; Rodwin, 2001). Interpreted as one epistemological view confronting other views, there is much indication that evidence based movements can be seen as modern empiricist/positivist movements that are opposed to, for example, more interpretative tendencies in the same disciplines. As formulated by Sundin (2003, p 178):

Within the evidence-based movement, especially evidence-based medicine, a hierarchy of scientific methods has been established in order to evaluate the “veracity” of research findings. This hierarchy can differ in details, but at the top is Randomized Controlled Trials (RCT), or compilations of such, and at the bottom are case studies and qualitative research. Since medical knowledge has precedence in healthcare, other professions interested in the evidence-based movement have had to relate to this hierarchy. Problems occur – depending on how strictly the hierarchy of evidence is followed- in the meeting between evidence-based medicine and the often qualitative human sciences oriented nursing research of today (Willman and Stoltz, 2002). It can be maintained that the methods of the evidence-based movements have a specific in-built epistemology and that it is therefore problematic to transmit the ambitions of the movement from medicine to nursing. The above described hierarchy of evidence has thus partly challenged qualitative nursing research whose findings by definition always end up furthest down in the hierarchy.

---

The evidence-based movement is particularly important for LIS because of its explicit and formalised methods for the indexing and retrieving of documents. The Medline database has changed its indexing principles according to demands raised by this movement (and thus confirm Hjørland's (1998) claim that principles of indexing and retrieval, etc. are theoretically founded in epistemological principles). The Cochrane Collaboration[12] with its databases and reviews, as well as the concept of meta-analysis are important elements in this movement[13]. It has provided important views, which LIS can use as points of departure, and in a way the principles of meta-analysis represents the most precise principles for literature searching that we have today. Although these views may seem too mechanical, too simplistic and too positivist, they are nonetheless important as theoretical views which it is possible to relate to.

Attempts have been made to combine positivism with other, more qualitatively oriented approaches. One such attempt is Grounded Theory (see Seldén, 2005). Grounded Theory is an approach that explicitly relates to researchers' background-knowledge and their use of literature and libraries (see Strauss and Corbin, 1990). As pointed out by Seldén, Grounded Theory may, however, be problematic on this point.

Further investigation of the strength and weaknesses of the empiristic/positivist tradition may thus be seen as epistemological investigation which has the possibilities of contributing to a fruitful take-off for information studies because it relates to how researchers should use literature[14].

## 6. Criticisms of positivism

Positivism has been criticised from many positions, especially from leading positivists who have changed their view. Kincaid (1998) summarises the criticism:

Perhaps most heavily criticized was the positivist claim that theories must be translatable into observational terms. This claim was criticized on several grounds:

- (1) The theory/observation distinction is difficult to draw in any sharp way,
- (2) Attempts to translate theoretical terms into observational ones often presupposed theoretical terms in the process of describing the observational data; theoretical terms can be applied in indefinitely many ways to observations, and
- (3) Even if the theory/observation distinction could be drawn, every scientific test involves background theoretical assumptions, thus showing that observational evidence has no absolute epistemic status.

Kincaid further demonstrates how these criticisms lead to doubts about the positivist notion of a unified science: if theoretical terms cannot and need not be reduced to observational ones, then it seems unlikely that the special sciences (biology, psychology, sociology, and so on) are reducible to physics or that they should be in order to become good sciences. A further implication of these criticisms was that behaviourism and operationalism lost much of their motivation if good natural science is not translatable into purely observational terms. Methodological individualism is also much less plausible once the reductionist picture of scientific unity is rejected. It has been shown that precisely the same problems that prevent any reduction of the theoretical to the observational confront attempts to reduce the social to the individual. The positivist search for an a priori universal scientific method was also criticised. The holistic picture of theory evaluation suggested that abstract scientific methods by no



---

means exhaust the practice of science and that much substantive, domain-specific information is involved in their application.

Empiricism, rationalism and positivism share some assumptions that have been criticised from hermeneutical, historicist, pragmatic and critical epistemologies. Among the important assumptions are the views that concepts are formed in the individual mind and that perceptual processes are mechanical processes that process chemical and physical stimuli. Critics have pointed out that our perceptual processes are influenced by our language and culture; that they are not just mechanical processes, but are also kinds of acts that are influenced by cultural, theoretical and pragmatic issues. When we, for example, learn to use the word “cup”, we are not just making an arbitrary association between a given set of stimuli patterns and the word “cup”, but we are learning something about a specific human tool and humankind’s experience with that tool. The implication is that our most primitive sensing is already theory-laden, and exactly this assumption is the most important point on which positivist and non-positivist epistemologies disagree. If our primitive sensations are not just “given”, but are influenced by our cultural and theoretical subjectivity, then no form of mechanical accumulation of data can provide knowledge. Instead we must gather knowledge by engaging in interpreting different kinds of theoretical, empirical, historical and axiological kinds of information. The claim of the critics of positivism is thus that the kind of library and literature study that the empirical traditions wish to avoid (“read nature not books”) cannot be and should not be avoided.

Another criticism focuses on the alleged neutrality of empiricism, rationalism and positivism. Critical positions such as feminist epistemologies, pragmatism and critical theory have pointed out that the claimed neutrality is not real, but that researchers who claim to be neutral in reality just hide which interests they support (see Hjørland, 2004b).

### **7. Empiricism, rationalism and positivism in LIS**

It is not a simple job to trace the influence of different epistemologies in LIS because they are often used implicitly and unconsciously. Hjørland (1997) made an interpretation of how different positions in LIS may be related to different epistemologies. One example is the facet-analytical school of classification founded by Ranganathan. This is seen as a rather strong example of a rationalist philosophy in LIS. It is a position that does not consider the empirical basis (or testing) of systems very much. It is strong, however, in providing clear definitions and rules. Systems such as thesauri or classifications based on this approach often display a high degree of structure and clarity, which is lacking in systems developed by other traditions.

A few writers have addressed the role of positivist assumptions in LIS. Among them are Dick (1991 1993)[15]; Hjørland (1997, 2003a, b); Peters (1977); Radford (1992); Rayward (1994); Svenonius (2004) and Wildemuth (1993). Although some of these authors argue eclectically that both positivist and other perspectives should be used in information science, nobody has put forward any strong argumentation concerning the benefits of empiricism/positivism[16]. This does not imply, however, that positivist thought is not strongly influential in LIS. It only means that dominant tendencies in LIS are not based on explicit arguments.

One example of the influence of positivism in LIS has been put forward by Rayward (1994), who finds that “the outmoded paradigm of nineteenth-century positivism”

---

visible in some of Paul Otlet's basic ideas is still to be found in much contemporary research. He writes:

Otlet's concern was for the objective knowledge that was both contained in and hidden by documents. His view of knowledge was authoritarian, reductionist, positivist, simplistic – and optimistic! . . . It is merely a question of institutionalizing certain processes for analyzing and organizing the content of documents. For him that aspect of the content of documents with which we must be concerned is facts. He speaks almost everywhere of *facts*.

. . . At first sight there is a startling contrast between what Otlet was writing about and what Landow and others who are interested in understanding hypertext in terms of modern critical theory are describing. But when posed in this way, the difference makes us look a little more closely at what some of the accounts of modern hypertext systems, especially in their grandiose, theoretical, "macro-text" manifestations, are actually saying. Is it possible that, despite the rhetorical flourishes, there is, deeply embedded in the accounts of some of these systems, what might be described as a "remainder" of nineteenth-century positivism?.

. . . In describing the Xanadu Project, Nelson (1987) for example, in capital letters, says that it is "just one thing: a new form of interconnection for computer files – corresponding to the true inter-connection of ideas which can be refined and elaborated into a shared network" (p. 143). These words and the sentiments that they both express and seem to imply could be, except for the term "computer files," Otlet's own. They suggest an atavistic positivist perspective that takes one by surprise (Rayward, 1994, pp. 247-8).

Another point of view concerning the influence of positivism in LIS has been formulated by Wilson (2002):

. . . it is particularly striking that over the past 50 years or so there has been a shift in information research from a predominantly positivist model of the world to a predominantly phenomenological perspective. The evidence is there in the literature. For example, if we look at the papers prepared for the Royal Society Scientific Information Conference (*Report and Papers Submitted*, 1948) we find, perhaps not surprisingly, given the sponsoring organization, that the majority are prepared from a positivist perspective – the emphasis is upon counting things and occurrences of events. We learn little from the papers about the behaviour of scientists, or their motivations, or about the context in which their information needs arise, or about what factors affect their judgements. We do learn about the length of scientific papers (Read, 1948), on various aspects of botanical journals (Royal Botanic Gardens, 1948), and on the mechanisation of UDC (Holmstrom, 1948) but we learn little of deeper significance. Given the changes in the technology of information delivery since 1948 it is not surprising that the papers have a somewhat antique air about them and there appears to be little of relevance to the present-day behaviour of scientists, simply because behaviour *per se* was not the subject of investigation. Ten years later, when the successor conference was held, this time, significantly, in the USA (International Conference on Scientific Information, 1959), with many more papers, the same paradigm prevailed, although, occasionally, a more sophisticated sociological approach was evident, for example, in Scott (1959).

Since the 1980s, however, there has been a shift in research methods towards the employment of so-called qualitative methods. (and, as an aside, it is interesting that the positivist view persisted in information science in North America for much longer than in Europe). However, method without a philosophical framework that determines why a particular method is employed and what view of reality the researcher holds, is purely mechanistic. The choice of an appropriate research method should be determined by a combination of the philosophical position of the researcher *vis-à-vis* the research objectives, the nature of the problem to be explored, its novelty in research terms, and the time and resources available to carry out the work. The leap that students, in particular, make from statement of the problem to data collection without the benefit of a perspective to guide either

the choice of problem or the choice of method is one of the principal reasons for the relatively low level of a great deal of research in the field.

In the quotation above Wilson makes some important characterisations of some kinds of positivist research in LIS. I do not agree, however, that positivism does not any longer dominate in LIS. This will be demonstrated with a few examples.

### 7.1. Case 1: inter-indexer consistency

A typical kind of empiricist/positivist studies in LIS is studies of “inter-indexer consistency”. Studies of this kind seem to expect that there is one correct way of indexing documents and that indexers who differ from other indexers are wrong. The last expectation is problematic because indexers may be consistently wrong in their indexing. Majority votes are irrelevant when it comes to scientific and scholarly judgments, only the kinds of evidence and arguments put forwards count. The positivist assumptions guiding most of such studies can be uncovered at two levels:

- (1) Such studies are positivist in their methodology, in their tendencies to count the number of agreements (or disagreements) in indexing the same documents rather than asking the indexers why they indexed the documents the way they did.
- (2) Such studies are positivist in their assumptions about the indexer and the indexing process. They typically do not consider the indexers’ interpretations, subject knowledge or world-views, but tend to regard indexers as automata that sometimes make mistakes. In other words they regard indexing as a value-free task, not as an act of making priorities in mediating content for potential needs.

This second level of positivism seems much more important than the first level. Most people tend to look at epistemologies only in the first sense: as methodologies in research in a narrow sense. By introducing the second level, the boundaries between epistemologies and subject specific theories (e.g. theories of indexing) become blurred, and the philosophy of science turns out to have far-reaching consequences for theories and practices of library and information science. This view of indexer-inconsistency studies is strongly emphasised by Bade (2003, pp. 71-2; italics added):

One major problem with “indexer inconsistency”, both as a theoretical and as a practical issue, is that “consistency” can be and nearly always is measured simply by counting the number of times two (or more) indexers agree or disagree. What is completely left out of account is not only the item described but the competencies, knowledge of LCSH, educational background, past reading and any other factor which may be relevant (e.g. were they rushed to complete their work? Were they poorly paid? Where they careless or conscientious in other areas of their life and work?) If one takes into account only the records then the results are worthless, *as in most studies to date*. If one additionally takes into account the books themselves – as in the present study and that of Mueller and Steinhagen – the results differ greatly and are meaningful. Anyone wishing to attempt an adequate scientific study of indexer consistency must take into account the very many factors which come into play in the real world practice of catalogers; *any test made under controlled conditions will be irrelevant to an understanding of indexing as it is practiced since however “controlled” the working conditions, catalogers do not work in the conditions of a controlled experiment. By refusing to establish the range of acceptable subject headings - based on a knowledge of the contents of the item analyzed – and judging the indexers’ conformity to that subset of the indexing language, the count is indeed only a count of indexer consistency and not of appropriateness, the*

---

*characteristic which alone matters.* If the researcher cannot determine what an appropriate description would be, then it is impossible to evaluate the description provided by anyone: *any description is as good as any other*[17]. The only thing such studies have done is to count disagreements and the numbers obtained have absolutely no relation to the documents being analysed. While what has been subject to experimental control is the book analyzed, what is counted is the judgements of the catalogers/indexers and these have been selected according to no criteria at all.

The chief problem for the study of subject appropriateness (correctness, usefulness) is that in order to judge the appropriateness of the subject headings assigned one must have already determined what the subject heading should be, and that determination is exactly the same kind of judgment that one intends to evaluate.

This example is thus an indication that positivist assumptions in research on indexing have been unfruitful and delayed the development of the field.

### 7.2. Case 2: relevance research

In information retrieval experiments are evaluations often performed by comparing the outcome of two kinds of systems. The output is judged relevant or non-relevant (binary) or less often, it is judged relevant to some degree. The argument here is that there are many causes why some output may be non-relevant. As described in the quotation from Kincaid (1998) above, the tendency in positivist research is to focus only on correlations between variables while drawing no conclusions about causes. Thousands of studies on relevance in information science have failed to advance our knowledge about the underlying mechanisms in the production of non-relevant items in information systems. Positivism is not realist science, and so positivism neglects the stratified system of causes. When it comes to relevance, the production of non-relevant items may be caused by such different causes such as:

- False drops (also called false associations).
- A word is used in another conceptual meaning, that the searcher intended. The relevant concept is mentioned, but in a concrete document, which cannot be generalised to the user's problem.
- The reference is to a document in a language not understood by the user. The document describes some research, which has been done with research methods, that the user finds is below standard.
- The document is written from theoretical perspectives (or in a style, or in publications, or citing authors, etc.) which the user has no confidence in the document lacks perspective or horizon (seems to be traditional research made for its own sake rather than for solving a problem).
- Implications for practice seem too vague; the link to the user's own work domain cannot be drawn.
- The theses or implications of the document seem politically problematic for the user. The demands on time and effort to utilise the material are too heavy in the user's present situation.
- The user is afraid that his/her teacher or employer will find his/her reading of this material irrelevant or unwanted (see Hjørland, 2000; Hjørland and Sejer Christensen, 2002).

---

This example is thus also a demonstration of how positivist assumptions have been paralysing for advancing a core field within LIS.

### *7.3. Case 3: the cognitive view and methodological individualism*

As we saw above, Kincaid (1998) characterised modern positivism with its tendency towards methodological individualism (MI) and pointed out that the criticism of positivism has undercut the motivations for MI[18]. In information science MI has in particular been associated with the cognitive view put forward by researchers like Nicholas J. Belkin and Peter Ingwersen. The point of departure of this view was the idea that psychological studies of human beings might provide the basis for the design of information systems. This view has been criticised by, among others, Frohmann (1990) and Hjørland (1991, 1997, 2002b) and more sociologically-oriented approaches were recommended as a replacement of the cognitive view and of MI, which is associated with it. Today Ingwersen is mainly doing bibliometrical research (which is more sociologically and thus less MI oriented[19]), why a better representative for the original, individually orientated, cognitive view today probably is Jørgensen (2003).

A related issue is the tendency within cognitive and user-oriented approaches to provide abstract or generalised models of users. The criticism of positivism implied, as we saw, that abstract scientific methods by no means exhaust the practice of science and that much substantive, domain-specific information is involved in their application. This issue in positivism is thus related to issues concerning domain-general views versus domain specific views in information science. Thus, the domain-analytic approach in information science (Hjørland and Albrechtsen, 1995; Hjørland, 2002a) may also be seen as a criticism of positivist assumptions within LIS.

This last examples is thus indicating that arguments related to different approaches in LIS (such as cognitive views or domain-analytical views) are closely related to broader issues involving epistemological theories in general, and empiricism, rationalism and positivism in particular.

## **8. Summary and conclusion**

This paper has tried to introduce important problems related to empiricism, rationalism and positivism in general and in LIS in particular. It has been demonstrated that the interpretation of the meaning and implication of these traditions are not trivial, why a deeper investigation of their development, internal logic and consequences have been necessary.

While vulgar interpretations associate positivism with quantitative, realist, “hard” methods in the sciences (as opposed to qualitative, “soft”, relativist methods of the humanities) it has been argued that these views are wrong. A deeper and more correct interpretation of positivism is provided by Kolakowski’s four criteria:

- (1) the rule of phenomenalism (there is no real difference between “essence” and “phenomenon”);
- (2) the rule of nominalism (insights formulated as general laws can only have individual concrete objects as real referents);
- (3) the rule that denies cognitive value to value judgements and normative statements; and

- 
- (4) the rule (or belief) that there is an essential unity of scientific method (downgrading the differences between different domains).

Another common mistake have been to confuse empiricism with empirical studies. Although extreme forms of rationalism were originally hostile towards empirical studies, this is not an issue: When we discuss different epistemologies today (in general or in a LIS-context) the question is how best to advance the field, and nobody argues against empirical studies. The question is how best to do such studies. Different philosophies have different answers to this question and it is important to understand the specific kind of answer that is provided by different epistemologies such as empiricism, rationalism, hermeneutics or critical realism. This paper has focused on the specific kinds of ideals that are connected with empiricism, rationalism and positivism. It has illuminated strengths and weaknesses inherent in these traditions. Such strength and weaknesses are revealed, for example, by the way that different approaches argue for their own views. This paper should not be seen as the last word about these epistemologies, but rather as a starting point for further investigations.

An important aspect of the empiricist traditions is its paradoxical attitude towards the use of literature and libraries in order to acquire and utilise knowledge. Bacon's motto "read nature not books" is demonstrated to be alive in this tradition and, at the same time, to be contradicted by the actual practices of its followers, who (of course) writes, uses and cites literature. In this paper it is suggested that the concepts of metaanalysis and evidence-based practice (e.g. evidence-based medicine) may be seen as explications of empiricism's latent attitude towards the use of literature. In this way empiricism may be seen as a normative theory of information seeking with clear relevance also for indexing and knowledge organisation. It may be a problematic theory, but it does provide a point of departure for further investigations and it shows the close relations between general epistemological theories on the one hand and substantial LIS theories concerning information seeking and knowledge organisation on the other.

Within the field of LIS very few researchers have scholarly competencies in the philosophy of science. The number of authors who have devoted publications to problems related to empiricism, rationalism and positivism seem to be about ten persons (an attempt have been made to cite them in this paper). There seems to be confusion on what these traditions mean in LIS, whether they are still alive and whether they have contributed to the development of our discipline or not. Wilson (2002), for example, consider positivism essentially replaced by phenomenology in LIS, whereas Rayward (1994) find positivism very much alive and writes about some hypertext studies that "they suggest an atavistic positivist perspective that takes one by surprise".

Based on the theoretical clarification in the first part the paper of what empiricism, rationalism and positivism mean and of the criticism raised against these positions, the final part of the paper addresses selected present-day research problems in LIS, which are all shown to be closely associated with positivism: inter-indexer consistency studies are typically positivist in their research methodology as well as in their fundamental view of what indexing is. They are more interested in counting the number of agreements and disagreements that they are in understanding the nature and causes of such disagreements. Relevance research is typical positivist in its tendency to psychologise criteria for what is relevant and thus seeking the secrets of



---

relevance in the individual rather than in scientific norms. It is also positivist in its tendency to consider correlations between different variables rather than, for example, to uncover the nature and causes of non-relevant items and, for example, to develop taxonomies of different kinds of errors and non-relevant output. The cognitive view is related to positivism in its tendency towards methodological individualism (the reduction of sociological phenomena to psychological phenomena). Also the widespread tendency to assume universal principles (as opposed to culture-relative and domain-specific principles) is related to positivist assumptions.

It has not been the objective to present alternative views in this article because this whole issue is devoted to different philosophies of science and their relations to LIS. The ambition of this paper has thus been to demonstrate that issues related to empiricism, rationalism and positivism are important in order to understand and properly to address research in general as well as in LIS.

### Notes

1. The term “logical empiricism” is almost synonymous with “logical positivism” or “neopositivism”.
2. “The positive philosophy is according to the explicit and repeated statement of Comte not empiricism” (Høffding, 1922, pp. 57-8; my translation). Høffding (1825) refers to the last volume of “*Cours*”, to “*Discours sur l’esprit positif*” and “*Considérations philosophiques sur les sciences et les savants*” and declares: “Already in 1825 he demonstrates in “*Considérations philosophiques sur les sciences et les savants*” that an absolute empiricism is impossible. Science is not just a collection of facts. Its essential task is the connection of evidences; it consists of laws, not of bare facts. No isolated fact is incorporated in science. It becomes not part of science before the isolation is lifted by being connected to another fact – at least by means of a hypothesis. Comte (1830-1842, *Cours IV*, p. 300) even make the interesting remark that “no isolated and pure empirical observance can be certain” (Høffding, 1922, p. 58; my translation). It is also a central part of Comte’s epistemology that he considered knowledge to be relative to biological, historical and social conditions. He critiqued tendencies to study human psychology and cognition in isolation from social and cultural influences.
3. Some of the main works were translated into English with a considerable delay – or not at all. Habermas’ (1962) book was thus translated into English with a delay of 27 years (Habermas, 1989)!
4. The development of non-Euclidian geometry, the nineteenth century’s most important contribution to mathematics, brought a crisis to the rationalist view in questioning its most important example.
5. Content analysis is a well known concept in many social sciences, which is related to subject analysis in LIS. Krippendorff (1989) presents a dilemma for such analyses: “If categories are obtained from the very material being analyzed, findings are not generalisable much beyond the given data. If they are derived from a general theory, findings tend to ignore much of the symbolic richness and uniqueness of the data in hand. The compromises content analysis must seek are rarely easy ones”. The first strategy is a more empirical, bottom-up one, while the second is a more rationalist, top-down strategy.
6. The following quote underlines the same issue: “All competent thinkers agree with Bacon that there can be no real knowledge except that which rests upon observed facts. This fundamental maxim is evidently indisputable if it is applied, as it ought to be, to the mature state of our intelligence. But, if we consider the origin of our knowledge, it is no less certain that the primitive human mind could not, and indeed ought not to, have thought in that way. For if, on the one hand, every Positive theory must necessarily be founded upon

observations, it is, on the other hand, no less true that, in order to observe, our mind has need of some theory or other. If in contemplating phenomena we did not immediately connect them with some principles, not only would it be impossible for us to combine these isolated observations, and therefore to derive any profit from them, but we should even be entirely incapable of remembering the facts, which would for the most part remain unnoted by us” (Comte, 1830-1842, emphasis added).

The original French version reads: “*Tous les bons esprits répètent, depuis Bacon, qu’il n’y a de connaissances réelles que celles qui reposent sur des faits observés. Cette maxime fondamentale est évidemment incontestable, si on l’applique comme il convient à l’état viril de notre intelligence. Mais, en se reportant à la formation de nos connaissances, il n’en est pas moins certain que l’esprit humain, dans son état primitif, ne pouvait ni ne devait penser ainsi. Car si, d’un côté, toute théorie positive doit nécessairement être fondée sur des observations, il est également sensible, d’un autre côté, que, pour se livrer à l’observation, notre esprit a besoin d’une théorie quelconque. Si, en contemplant les phénomènes, nous ne les rattachions point immédiatement à quelques principes, non seulement il nous serait impossible de combiner ces observations isolées, et, par conséquent, d’en tirer aucun fruit, mais nous serions même entièrement incapables de les retenir, et, le plus souvent, les faits resteraient inaperçus sous nos yeux*” (Comte, p. 29-30, notes excluded).

7. An interesting example of psychologism is George Boole, who saw his famous Boolean logic as “laws of thought”.
8. What Svenonius (2004, p. 574) regard as a weakness of operationalism is caused by the very attempt to quantify: the tendency to oversimplify. It is not clear, however, whether Svenonius claim that all quantitative studies are results of logical positivism or what specific influence LP has had on measurement. Quantitative studies are much older than LP and may be informed by other philosophies as well.
9. For example, defining intelligence as that which is measured by intelligence tests. This is clearly a circular definition, for what criteria guide the development of the tests in the first place? Women are, for example, better at certain task, while men are better at other tasks. The selection of the tasks must be guided by some theory and principles that cannot be defined operationally.
10. Wittgenstein acknowledges that all the propositions of the *Tractatus* are themselves nonsensical, and that they are to be used only as steps, “to climb up beyond them”. He remarks that the reader must “throw away the ladder after he has climbed up it” (Wittgenstein, 1922, p. 6.54). Wittgenstein thus followed traditional empiricism in the strange paradoxical attitude towards literature, although he acknowledges some initial functions of literature in the process of learning. It is well known that Wittgenstein later repudiated from his former positivist view and developed a more pragmatic view.
11. The answer to this question will, by the way, also reveal the nature of an empiricist view of citations.
12. <http://www.cochrane.org/index0.htm>
13. For an overview of literature on metaanalysis see Hjørland (2001).
14. *The Economist* (2004, p. 69) brought an article about why so many business books are awful. The paper concluded: “It is hard to believe that many managers run their business differently as a result of their reading. Occasionally, however, a truly great business book will articulate an idea that helps them to explain what it is that they are trying to do. It creates phrases – such as ‘core competence’ or ‘emotional intelligence’ – that fit the moment. But a few lines of ‘*Henry IV, Part II*’ might well serve the same function, and give more pleasure too.” Maybe this conclusion may be interpreted as a kind of criticism of the positivist neglect of classical knowledge and focus on “new” knowledge based on observations?

15. Most notably has Dick (1991, 1993) and Wildemuth (1993) argued eclectically for a combination of positivist and non-positivist epistemologies and against the tendency provided by “positivist-bashers”.
16. Svenonius (2004) represents the strongest arguments in LIS in favour of a logical positivist approach.
17. Bade’s italics.
18. Positivist thought tends to psychologise epistemology, while hermeneutically- and critically-oriented views tend to epistemologise psychology. This has consequences for user studies in information science.
19. That MI is associated with modern positivism does not imply, however, that most bibliometrical and sociological research in IS is not influenced by positivism too. Such research might be carried out according to ideals that are associated with positivism or according to ideals that reject such assumptions.

### References

- Adorno, T.W., Albert, H., Darendorf, R., Habermas, J., Pilot, H. and Popper, K.R. (1976), *The Positivist Dispute in German Sociology*, trans. by Adey, G. and Frisby, D., Heinemann, London.
- Alston, W.P. (1998), “Empiricism”, *Routledge Encyclopedia of Philosophy, Version 1.0*, Routledge, London.
- Bade, D.W. (2003), *Misinformation and Meaning in Library Catalogs*, David Bade, Chicago, IL.
- Comte, A. (1830-1842), “Cours de philosophie positive. Ire et 2e leçons”, available at: [www.uqac.quebec.ca/zone30/Classiques\\_des\\_sciences\\_sociales/classiques/Comte\\_auguste/cours\\_philo\\_positive/cours\\_philo\\_pos\\_1\\_2.doc](http://www.uqac.quebec.ca/zone30/Classiques_des_sciences_sociales/classiques/Comte_auguste/cours_philo_positive/cours_philo_pos_1_2.doc) (accessed 25 August, 2004), English translation available at: <http://radicalacademy.com/adiphiloessay42.htm>
- Dick, A.L. (1991), “The influence of positivism on the design of scientific techniques: implications for library and information science research”, *South African Journal for Library and Information Science*, Vol. 59 No. 4, pp. 231-9.
- Dick, A.L. (1993), “Three paths to inquiry in library and information science: positivist, constructivist and critical theory approaches”, *South African Journal of Library and Information Science*, Vol. 61 No. 2, pp. 53-60.
- (*The Economist* (2004), 21 August.
- Eldredge, J.D. (2000), “Evidence-based librarianship: an overview”, *Bulletin of the Medical Library Association*, Vol. 88 No. 4, pp. 289-302.
- Fox, R.E. (2000), *The Dark Side of Evidence-based Treatment*, American Psychological Association, Washington, DC, available at: [www.apa.org/practice/pf/jan00/cappchair.html](http://www.apa.org/practice/pf/jan00/cappchair.html) (accessed August 2004).
- Frohmann, B. (1990), “Rules of indexing: a critique of mentalism in information retrieval theory”, *Journal of Documentation*, Vol. 46 No. 2, pp. 81-101.
- Garrett, D. and Barbanell, E. (Eds) (1997), *Encyclopedia of Empiricism*, Fitzroy Dearborn Publishers, London.
- Haakonssen, K. (1973), “Introduction”, in Kuhn, T.S. (Ed.), *Videnskabens revolutioner (The Structure of Scientific Revolutions)*, Danish trans. by Haakonssen, K., Fremad, Copenhagen.
- Habermas, J. (1962), *Strukturwandel der Öffentlichkeit*, Neuwied, Berlin.

- Habermas, J. (1989), *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, The MIT Press, Cambridge, MA.
- Hjørland, B. (1991), "Det kognitive paradigme i biblioteks- og informationsvidenskaben ("The cognitive paradigm in library and information science")", *Biblioteksarbejde*, Vol. 33, pp. 5-37.
- Hjørland, B. (1997), *Information Seeking and Subject Representation. An Activity-theoretical Approach to Information Science*, Greenwood Press, Westport, CT and London.
- Hjørland, B. (1998), "Theory and metatheory of information science: a new interpretation", *Journal of Documentation*, Vol. 54 No. 5, pp. 606-21.
- Hjørland, B. (2000), "Relevance research: the missing perspective(s): 'non-relevance' and 'epistemological relevance'", *Journal of the American Society for Information Science*, Vol. 51 No. 2, pp. 209-11.
- Hjørland, B. (2001), "Why is meta-analysis neglected by information scientists?", *Journal of the American Society for Information Science and Technology*, Vol. 52 No. 13, pp. 1193-4.
- Hjørland, B. (2002a), "Domain analysis in information science. Eleven approaches – traditional as well as innovative", *Journal of Documentation*, Vol. 58 No. 4, pp. 422-62.
- Hjørland, B. (2002b), "Epistemology and the socio-cognitive perspective in information science", *Journal of the American Society for Information Science and Technology*, Vol. 53 No. 4, pp. 257-70.
- Hjørland, B. (2003a), "Empiricism and positivism", in Feather, J. and Sturges, P. (Eds), *International Encyclopedia of Information and Library Science*, 2nd ed., Routledge, London, pp. 179-81.
- Hjørland, B. (2003b), "Hermeneutics", in Feather, J. and Sturges, P. (Eds), *International Encyclopedia of Information and Library Science*, 2nd ed., Routledge, London, pp. 223-5.
- Hjørland, B. (2004a), "Arguments for philosophical realism in library and information science", *Library Trends*, Vol. 52 No. 3, pp. 488-506.
- Hjørland, B. (2004b), "Social and cultural awareness and responsibility in library, information and documentation studies", in Rayward, B., Hansson, J. and Suominen, V. (Eds), *Aware and Responsible*, Scarecrow Press, Lanham, MD, pp. 71-91.
- Hjørland, B. and Albrechtsen, H. (1995), "Toward a new horizon in information science: domain analysis", *Journal of the American Society for Information Science*, Vol. 46 No. 6, pp. 400-25.
- Hjørland, B. and Sejer Christensen, F. (2002), "Work tasks and socio-cognitive relevance: a specific example", *Journal of the American Society for Information Science and Technology*, Vol. 53 No. 11, pp. 960-5.
- Høffding, H. (1922), *Den nyere filosofis historie*, 3. udgave. Bind 1-4, Gyldendalske Boghandel, København.
- Holmstrom, J.E. (1948), "Decimal classification mechanized by microphotography and keyed by a special alphabetical system", *Report and Papers Submitted. Papers Presented at the Royal Society Scientific Information Conference*, Royal Society, London, pp. 384-404.
- Hume, D. (1758), *An Enquiry concerning the Human Understanding*, PDF Collier & Son, London.
- International Conference on Scientific Information (1959), *Proceedings of the International Conference on Scientific Information*, Washington, DC, November 16-21, 1958, National Academy of Sciences – National Research Council, Washington, DC.
- Jørgensen, C. (2003), *Image Retrieval. Theory and Research*, Scarecrow Press, Lanham, MD.
- Kincaid, H. (1998), "Positivism in the social sciences", *Routledge Encyclopedia of Philosophy, Version 1.0*, Routledge, London.

- Kolakowski, L. (1968), *Alienation of Reason: A History of Positivist Thought*, trans. by Guterman, N., Doubleday, New York, NY.
- Krippendorff, K. (1989), "Content analysis (Vol. 1, pp. 403-407)", in Barnouw, E., Bradley, R., MacDonald, S. and Zimmerman, P.R. (Eds), *International Encyclopedia of Communications*, Vol. 1-4, Oxford University Press, New York, NY and Oxford.
- Kuhn, T. (1962), *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, IL.
- Lenin, V. (1947), *Materialism and Empirio-criticism*, trans. by Fineberg, A., Foreign Languages Publishing House, Moscow (originally published in 1908).
- Mallery, J.C., Hurwitz, R. and Duffy, G. (1992), "Hermeneutics", in Shapiro, S.C. (Ed.), *Encyclopedia of Artificial Intelligence*, 2nd ed., John Wiley & Sons, New York, NY, pp. 596-611.
- Mueller, A.P. (2003), "The ghost that haunts Brazil", available at: [www.neoliberalismo.com/Archivo-01/ghost.htm](http://www.neoliberalismo.com/Archivo-01/ghost.htm) (accessed 26 August 2004).
- Olaisen, J. (1996), "Pluralism or positivistic trivialism?: Important trends in contemporary philosophy of science", in Olaisen, O., Wilson, P. and Munch-Pedersen, E. (Eds), *Information Science: From the Development of the Discipline to Social Interaction*, Scandinavian University Press, Oslo, pp. 277-323.
- Ørom, A. (2003), "Knowledge organization in the domain of art studies – history, transition and conceptual changes", *Knowledge Organization*, Vol. 30 No. 3/4, pp. 128-43.
- Peters, P.E. (1977), "Philosophy of science", in Kent, A., Lancouer, H. and Daily, J.E. (Eds), *Encyclopedia of Library and Information Science*, Vol. 22, Marcel Dekker, New York, NY, pp. 183-207.
- Radford, G. (1992), "Positivism, Foucault, and the fantasia of the library: conceptions of knowledge and the modern library experience", *Library Quarterly*, Vol. 62, Spring, pp. 408-24.
- Rayward, W.B. (1994), "Visions of Xanadu: Paul Otlet (1868-1944) and hypertext", *Journal of the American Society for Information Science*, Vol. 45 No. 4, pp. 235-50.
- Rayward, W.B. (2004), "Francis Bacon's natural history and problems of the communication of scientific knowledge", in Rayward, B., Hansson, J. and Suominen, V. (Eds), *Aware and Responsible*, Scarecrow Press, Lanham, MD, pp. 115-39.
- Read, D.R. (1948), "The length of scientific papers", *Report and Papers Submitted. Papers Presented at the Royal Society Scientific Information Conference*, Royal Society, London, pp. 530-2.
- Report and Papers Submitted* (1948), *Papers Presented at the Royal Society Scientific Information Conference*, Royal Society, London.
- Rodwin, M.A. (2001), "The politics of evidence-based medicine", *Journal of Health Politics, Policy and Law*, Vol. 26 No. 2, April, available at: [www.ahrq.gov/clinic/jhpl/rodwin.htm](http://www.ahrq.gov/clinic/jhpl/rodwin.htm) (accessed 21 August 2004).
- Royal Botanic Gardens (1948), "A note on botanical periodicals", *Report and Papers Submitted. Papers Presented at the Royal Society Scientific Information Conference*, Royal Society, London, pp. 368-9.
- Scott, C. (1959), "The use of technical literature by industrial technologists", *Proceedings of the International Conference on Scientific Information, Washington, DC, November 16-21, 1958*, National Academy of Sciences – National Research Council, Washington, DC, pp. 245-66.
- Seldén, L. (2005), "On grounded theory – with some malice", *Journal of Documentation*, Vol. 61 No. 1, pp. 114-29.

- 
- Skinner, B.F. (1983), "Origins of a behaviorist", *Psychology Today*, September, pp. 22-33.
- Smith, L.D. (1986), *Behaviorism and Logical Positivism. A Reassessment of the Alliance*, Stanford University Press, Stanford, CA.
- Strauss, A. and Corbin, J. (1990), *Basics of Qualitative Research*, Sage, Newbury Park, CA.
- Sundin, O. (2003), "Towards an understanding of symbolic aspects of professional information: an analysis of the nursing knowledge domain", *Knowledge Organization*, Vol. 30 No. 3/4, pp. 170-81.
- Svenonius, E. (2004), "The epistemological foundations of knowledge representations", *Library Trends*, Vol. 52 No. 3, pp. 571-87.
- Turner, J.H. (1993), *Classical Sociological Theory: A Positivist's Perspective*, Nelson Hall, Chicago, IL.
- Weber, R. (2004), "Editor's comments: the rhetoric of positivism versus interpretivism: a personal view", *MIS Quarterly*, Vol. 28 No. 1, pp. iii-xii.
- Wildemuth, B.M. (1993), "Post-positivistic research: two examples of methodological pluralism", *Library Quarterly*, Vol. 63 No. 4, pp. 450-68.
- Willman, A. and Stoltz, P. (2002), "Yes, no, or perhaps: reflections on Swedish human science nursing research development", *Nursing Science Quarterly*, Vol. 15 No. 1, pp. 66-70.
- Wilson, T. (2002), "Philosophical foundations and research relevance: issues for information research", paper presented at CoLIS4 – 4th International Conference on Conceptions of Library and Information Science: Emerging Frameworks and Method, University of Washington, Seattle, WA, 21-25 July, available at: <http://informationr.net/tdw/publ/papers/COLIS4.html> (accessed 26 August 2004).
- Wittgenstein, L. (1922), *Tractatus Logico-philosophicus*, K. Paul, Trench, Trubner & Co., London.
- Worrall, J. (2002), "What evidence in evidence-based medicine?", *Philosophy of Science*, Vol. 69, September, pp. S316-30, available at: [www.lse.ac.uk/Depts/cpnss/pdf/pdfcaus/CTR%2001-02.pdf](http://www.lse.ac.uk/Depts/cpnss/pdf/pdfcaus/CTR%2001-02.pdf) (accessed 21 August 2004).
- Zins, C. and Guttman, D. (2003), "Domain analysis of social work: an example of an integrated methodological approach", *Knowledge Organization*, Vol. 30 No. 3/4, pp. 196-212.

### Further reading

- Smith, R. (2001), "Human sciences", in Smelser, N.J. and Baltes, P.B. (Eds), *International Encyclopaedia of Social and Behavioural Sciences*, Pergamon-Elsevier Science, London, pp. 7027-31.