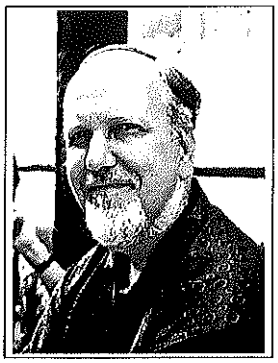
The Classification of Psychology: A Case Study in the Classification of a Knowledge Field

Birger Hjørland

The Royal School of Library and Information Science, Copenhagen



Birger Hjørland is Head of Department of Science and Humanities Information Studies, Royal School of Library and Information Science in Copenhagen. He earned his Ph.D. from the University of Gothenborg in 1993 in Information Science and a MA in psychology from the University of Copenhagen in 1974. He has been a research librarian at the Royal Library in Copenhagen 1978-1990 (subject specialist in Psychology) and the coordinator of the library's computer based reference services.

Hjørland, B. (1998). **The Classification of Psychology: A Case Study in the Classification of a Knowledge Field.** *Knowledge Organization, 25(4),* 162-201. 115 refs.

ABSTRACT: Different approaches to the classification of a knowledge field include empiristic, rationalistic, historicist, and pragmatic methods. This paper demonstrates how these different methods have been applied to the classification of psychology. An etymological approach is insufficient to define the subject matter of psychology, because other terms can be used to describe the same domain. To define the subject matter of psychology from the point of view of its formal establishment as a science and academic discipline (in Leipzig, 1879) is also insufficient because this was done in specific historical circumstances, which narrowed the subject matter to physiologically-related issues. When defining the subject area of a scientific field it is necessary to consider how different ontological and epistemological views have made their influences. A subject area and the approaches by which this subject area has been studied cannot be separated from each other without tracing their mutual historical interactions. The classification of a subject field is theory-laden and thus cannot be neutral or ahistorical. If classification research can claim to have a method that is more general than the study of the concrete developments in the single knowledge fields the key is to be found in the general epistemological theories. It is shown how basic epistemological assumptions have formed the different approaches to psychology during the 20th century. The progress in the understanding of basic philosophical questions is decisive both for the development of a knowledge field and as the point of departure of classification. The theoretical principles developed in this paper are applied in a brief analysis of some concrete classification systems, including the one used by PsycINFO / Psychological Abstracts. The role of classification in modern information retrieval is also briefly discussed.

1. Introduction

Classification in Psychology[1] and in Library and Information Science

This paper is about the classification of a specific subject domain: Psychology. As such it is meant to be a contribution to both psychology and to library and information science (LIS or just IS).[2]

As shown by Miksa (1998) there has been a philosophical and interdisciplinary "Movement to Classify Knowledge and the Sciences" beginning in the seventeenth century with persons like Tommaso Campanella and Francis Bacon. During the nineteenth century this movement became an activity of enormous proportions among a wide number of participants. "I sometimes speak of it as a time when anyone who was anybody in the realm of scholarship wrote a treatise on the topic" (Miksa, 1998, p. 34). Among the persons mentioned by Miksa is also Wilhelm Wundt (1832-1920). Wundt's contribution to the classification of knowledge may be obsolete, but his name is worth mentioning in this article. He was the person who most often gets the credit for the formal establishing of psychology as a science because he established the first psychological laboratory in the world in Leipzig in 1879.

According to Miksa this movement to classify knowledge and the sciences died out just after the beginning of the twentieth century. My own knowledge confirms this. It is extremely rare that articles on the classification of psychology or the place of psychology among other fields are published. Works such as Braun & Baribeau (1984) or the present article are exceptions to the rule.[3] What are the reasons? They might be a combination of the following: a) that nobody finds this problem of any interest any more. This could be influenced by the fact that b) the norms of scientific methodology have changed. This kind of approach went out of fashion during the strong positivistic trends in the beginning of the twentieth cen-

tury. c) Research has become more fragmented and also more applied in its orientation, which make this kind of classification research more difficult to justify. A final reason could be that d) these problems appear too difficult. Nobody feels they have the necessary background to be able to make a contribution.

It is my hope that this article might contribute to the understanding that the problems of classification of knowledge are both important and possible to tackle in interesting and fruitful ways. Recent interdisciplinary changes in the philosophy of science (from more empiristic and rationalistic tendencies towards more historical and holistic tendencies) also give some hope for such a change. But who should do this kind of research? Domain specialists (such as psychologists in this case)? Library and information scientists? Sociologists of science?[4] Philosophers? My answer is YES! They all should. Today all groups feel that this is beyond their competence. They feel that they have to learn too much about something that they are not primarily trained to do. We will all benefit if interdisciplinary research in this area begins to flourish.

2. On Methods of Classification[5]

In Hjørland, 1998b, I have presented a short outline of my theoretical view regarding the methods of classification. It is my claim that different methods of classification basically reflect different epistemological theories as shown in Figure 1 below.

In practice, however, classifications are often made without any explicit methodology; they are just based on the view or horizon of the persons who are doing the classification.[6] Research libraries and information systems (such as PsycINFO) often employ subject specialists to develop and update their systems or they import important parts of their system from recognized handbooks and other authoritative sources. But this is only to move the problem one step back: How do you know when a given source reflects "cognitive authority"? How do you distinguish between good and bad proposals? In order to evaluate this you must develop a theory about the methodology of classifying.

Different methods of classifying are in a very direct way related to different epistemological theories. Insight in epistemology can thus provide us with knowledge about the merits and weaknesses of the different solutions. Progress in the scientific method as well as in classification (which may be seen as part of the scientific methodology) must be based on the historical evidence gained in epistemology and science studies.

Figure 1 **Fundamental methods of Classification**

	Research Objects (E.g., Psychological phenomena) ("scientific classification")	**Documents** (E.g., psychological literature) ("bibliographic classification")
Empiricism (See also appendix 1)	Classification provided by statistical analysis (such as factor analysis) based on "resemblance". Examples: Classification of mental illness in psychiatry[7] or kinds of intelligence in psychology based on statistical analysis of test scores.	Documents clustered on the basis of some kind of similarity, e.g. common terms or bibliographical coupling. Examples: "Atlas of science" & "research fronts in SCI", algorithms for information retrieval.
Rationalism (See also appendix 2)	Classification based on logical divisions, e.g. classification of people in age groups. Examples: Frame-based systems in AI; Chomsky's analysis of deep structure in language & cognitive models of the mind in psychology	Facet analysis built on logical divisions and/or on "eternal and unchangeable categories" Examples: Ranganathan, BlissII & Langridge. Semantic networks.
Historicism (see also section 3 in this paper)	Classification based on natural development Example: The theory of evolution: Biological taxonomies	Systems based on the development of knowledge producing communities (the division of scientific labor) Example: The feature by the DDC that it distributes subjects by discipline
Pragmatism (see also section 5+6 in this paper)	Classification based on the analysis of goals and consequences ("critical classification")	Systems built on critical analysis of the development and state of knowledge. Examples: Francis Bacon, The French Encyclopaedists, the Marxists etc.

Figure 1 shows the relationship between basic epistemological theories and basic methods of classifying. Classification is done in all sciences, including psychology.[8] Like any other science IS has different approaches to classification based on different epistemological views. IS is mainly concerned with principles for classifying documents produced in other disciplines, which imply classification on a second order level. Classification in IS is not restricted to documents but can be applied to all forms of "information" represented in information systems. Different sciences may influence each other. Frame-based systems and semantic networks are examples of classifications developed in Artificial Intelligence (AI) and are also applied in IS. "Facet analysis" is a method of classification developed independently in IS and in psychology.

In my opinion there exist a limited number of basic methods of knowledge organization corresponding to basic epistemological views. A psychiatrist can, for example, classify mental illness using empirical methods, or rationalistic methods, or historical methods, or pragmatic methods (or, of course, combinations). In the same way, a psychologist can classify forms of intelligence or mental capacities by using statistical analysis of test scores (empirical method), by using computer models of cognitive processes (rationalistic methods), by studying the social construction of the intelligence concept (historical method), or by choosing a concept which fertilizes his general perspectives and aims (pragmatic method).

On another level, information scientists can use the same kinds of methods to organize documents, knowledge, or information. They can use empirical methods such as bibliometric linking and produce maps such as the "atlas of science". They can use rationalistic methods such as developing facets or principles for logical division, they can use historical methods such as revealing the cultural bias in different systems, or they can select classifications which support the aim of their activities.

Traditional ideals of classifying (as well as other aspects of scientific methodology) have tended to be empiristic or rationalistic, providing "neutral" or "objective" classifications. Modern epistemology, however, emphases the theory-laden character of observations, as well as the theory-laden character of classifications: They are not neutral discoveries but constructions which favor some kind of activities at the expense of other activities. This important insight is today often associated with "postmodernism" (cf., Miksa, 1998), but it was already developed by the pragmatic philosophers such as John Dewey in the beginning of the 20th century. It was, however, repressed by more empiristic and rationalistic influences (cf. Hjørland, 1997). This insight implies that we need to move from more positivistic approaches in classification toward more interpretative and neopragmatic approaches.

Conclusion: A classification cannot be neutral regarding approaches or theories about its subject matter. On the contrary: The classification of a subject field requires a conception or view of that particular field. (This does not, however, imply that the problems of classification only belong to the single disciplines and cannot be approached in fields like science studies or IS. There may be general approaches to analyzing the subject domains, and such knowledge is not typically part of the knowledge of the members of specific disciplines. In this paper, I shall try to show how this can be done more concretely.)[9]

3. A Short Outline of the Problems of *Defining Psychology, its Elements, Methods and Structure*

The term "psychology" goes back to about 1400-1500, but it first came into common use about 100 years later because of the works of Christian von Wolff (1679-1754).[10] "Psychology" is, however, just one term among many which have been used as a label to describe the subject area, which it is meant to represent.[11] Aristotle (384-322 B.C.) is considered to be the first person who has given a systematic description of psychological phenomena in the book "De anima" ("about the soul"[12]). Until the establishment of psychology as an "independent science" in the latter part of the 19th century, the study of psychological phenomena was mainly done in philosophy, but also in theology, in medicine, and in other fields. But what are the psychological phenomena?[13] And what principles define the subject area of psychology?

The formal establishment of psychology as a science was done under certain historical conditions, which favored certain views and approaches of the times. Psychology was first and foremost recognized as a science because it applied *the experimental method.* In American textbooks on the history of psychology this approach, which was founded by Wundt, has often been termed "structuralism" and is said to have died in America with E. B. Titchener (1867-1927). It was replaced by "functionalism" and behaviorism and other schools. This is, however, just one interpretation. Another interpretation says that Wundt (and in particular his predecessors Ernest Weber, 1795-1878 and Gustav Theodor Fechner, 1801-1887) founded psychophysics, which is a strong scientific subject area in psychology even today (even though it was born with very problematic metaphysical assumptions). What remains a fact is that psychology became split[14] by many different approaches which tend to define their own subject matter and classification of psychology. Titchener did not, for example, recognize

child psychology or animal psychology as parts of psychology, whereas these areas were very central in the contemporary school "functionalism". It is important to realize that these are not "accidental" properties of those theories, but that each theory, approach or "system" in psychology implicates in a very strong sense the subject matter and classification structure for psychology – even though this is seldom explicated very well.[15]

The formal establishment of psychology as a science[16] also raises an important question regarding the relation between "scientific psychology" as understood as that part of the psychological knowledge that is produced *inside* the borders of the formally established discipline, and the production of psychological knowledge produced *outside* these borders. A common sense consideration would say that psychological knowledge is that which is produced by psychologists (that is, the subject area and its formally educated workforce define each other in a mutual way). This is, however, a very problematic assumption, especially in the case of psychology. When psychology was established as a formal discipline about 1879 this was done on what must today[17] be considered a very limited approach compared to the huge amount of psychological knowledge produced in philosophy, theology, biology, medicine, and also outside the academic world.

In the process of its development psychology not only questioned its own foundation and established new different – and often conflicting – approaches. It also began to absorb (and perhaps to monopolize) other areas. Kurt Danziger exemplifies how the study of motivation became part of academic psychology:

> In 1928 the Harvard psychologist, L. T. Troland, published the first general text featuring the word "motivation" in the main title.... No doubt, the massive popularization of psychoanalysis in the post-war period played a significant role in establishing a link between the subject of psychology and the exploration of individual motives. In the subsequent academic literature on the topic of motivation Freud is always mentioned as a motivational theorist, if only to repudiate his theories as unscientific. Among other things, the construction of the new field of motivation enabled academic psychology to extend its dominion to topics that psychoanalysis had put on the agenda and threatened to monopolize. The new science of motivation began to act like a superior court that would adjudicate the truth claims of other psychologies. (Danziger, 1997, 111)

Danziger also describes how educational psychology and many other areas of applied psychology became parts of the overall discipline of psychology:

> The story of twenty-century academic Psychology is the story of an ultimately unsuccessful struggle against an ever more obvious fragmentation. Intelligence and its testing provided an early example of the discipline's tendency to annex new areas without being able to assimilate them.[18] Psychologists had gained an academic foothold by doing experiments on such topics as sensation, perception and memory. For some time, that remained the respectable core of the discipline, but how test intelligence related to this core was far from clear. It was much easier to annex such a field institutionally that to assimilate it intellectually.
>
> The situation was to be repeated many times over in the course of the twentieth century. Child study, or paedology, as it was known in some countries, was another example. Originating in joint efforts by physicians and educationists, it became transformed into child psychology, rapidly in the US, more slowly in Europe. But its links to core areas of the discipline remained tenuous at best. The same could be said of educational psychology, another early branch. In the period between the two world wars the discipline sprouted as many arms as Shiva, the Hindu deity. A psychological social psychology challenged its sociological rival, "personality" and "motivation" emerged as semi-autonomous fields of research and teaching, industrial psychology flourished, clinical psychology became a reality.
>
> What link was there between these fields, except that they all claimed to be "psychological"? But did that mean anything beyond a vague sense of common focus that was based on popular images rather than on solid scientific grounds? Grouping these diverse areas together as branches of one discipline undoubtedly had certain practical advantages. It advanced the cause of professionalization by implying that the more practically oriented branches had a respectable link to basic science, and it legitimized the otherwise esoteric interests of the academics by implying that their work had significant practical applications. But, for the most part, such implications were nothing more than promissory notes to be cashed in at some time in the future. Why should anyone accept these notes, and, more importantly, how could psychologists justify such promises to themselves?
>
> In the period under consideration here [second to fourth decades of the 20th century], that justification depended to a very large extent on the notion that, ultimately, Psychology was *one* discipline whose various branches would turn out to be linked by *one* set of principles. The grouping together of diverse fields of research and practice under one umbrella would then be more than a matter of historical accident and administrative convenience, it would be the logical consequence of deep theoretical links; common scientific "laws" would unify the discipline. As a first step in this direction, the various parts of the discipline would need to be tied together by common categories of discourse. Such common categories would establish the claim that there were indeed phenomena of importance that were common to all fields of Psychol-

ogy. Then one could study these common phenomena in order to discover the principles that unified the discipline.

This was the role played by the categories of "behaviour" and "learning" in the history of twentieth-century American Psychology.[19] Of the two, "behaviour" was more foundational, for it became the category that the discipline used to define its subject matter. ...

The history of "behaviour" is not only intertwisted with the history of "learning", it is also deeply entangled with the history of behavior*ism*. Unlike the other categories considered here, it has the unique distinction of having given its name to a *movement*. That leads to certain difficulties. We have to be careful not to confuse the history of the movement with the history of the category. They are far from being the same. ... (Danziger, 1997, 85-86)

The main thesis in Danziger's book (1997, p. 17) is that until the second half of the 20th century there was not one but several disciplinary languages of psychology [including categories of psychology and implying implicit classifications of the discipline], and each of them had its own historical trajectory. In the aftermath of World War II, however, the language of American Psychology was adopted virtually everywhere, a situation that has only begun to change recently. The period between 1910 and 1940 was a time of revolutionary change, not because the theories that explained the phenomena were changed, but because the phenomena themselves changed. They changed because the categories that defined them changed.

A striking feature of the discipline in its American incarnation was the impressive degree of uniformity achieved in its discourse – at least for a time. If one were to give a name to this hegemonic form of discourse one would have to call it "behavioral". This does not mean that most American psychologists were behaviorists, a judgment about their explicit theoretical commitments. Whatever those commitments might have been, most of them were quite ready to use the specialized terms of their discipline in a manner that conceded many of the assumptions of behaviorism and made them invisible.

In chapter ten Danziger raises the question of whether psychological categories can be said to constitute "natural kinds", whether they mirror the structure of a psychological reality that exists independently of them. After considering the social contextualization of these categories and their referential role, that question is ultimately answered in the negative.[20]

– – –

What have we learned from the above cited concerning the classification of psychology? *First of all, we have learned that it is very important to make a distinction between different kinds of concepts. We must analytically distinguish between the concept of discipline (and subdisciplines), scientific categories, subject areas, and approaches (or schools/systems/paradigms) as units for classification.*

We have seen how *the concept of discipline* illuminates the influences of the formal establishment and institutionalizing of a subject area. The division of academic labor in society has an influence on which subject areas are included and also the theoretical and methodological approach towards those subject areas.[21] We have also learned that disciplines can continue to exist and grow even if the criteria that played the decisive role in their establishment are later abandoned. They seem to follow a principle which Allport (1937) called "functional autonomy".

Psychological areas or subdisciplines are, for example, psychological processes within organisms (such as perception, learning, memory, emotions and motivation), developmental psychology, the psychology of personality, social psychology, and applied psychologies (e.g., clinical psychology, educational psychology, industrial- and organizational psychology etc.). Such areas can be seen as the object studied by specialized groups of people in the discipline, and in this respect they exist a priori to different approaches and theories. On the other hand, as science develops, areas and approaches studying these areas become more connected. In the case of psychology many subject areas existed before the science was formally established, and in the history of its development, these preexisting fields influenced the scientific approach just as principles and methods developed in the scientific organization influenced the subject areas.

Psychological approaches (or movements, views, schools, paradigms, currents, etc.) are the theories, basic forms of understanding, or ideas (ideologies), which have influenced the development of psychology. They have designed the categories as well as the theories and the concrete knowledge, which is established inside and outside the discipline. Examples are behaviorism, cognitivism, psychoanalysis, humanism, and the historical-cultural approach (see also appendix 3). According to Kuhn's (1970) theory of scientific revolutions scientists organize themselves around such paradigms. Kuhn differentiated between pre-scientific phases or stages, normal or paradigmatic phases, revolutionary phases, new paradigmatic phases and so on. Real science is characterized by normal phases in which there is almost total consensus concerning the discipline's fundamental approach. It is a question of interpretation whether Danziger's demonstration of the generality of a soft behaviorist approach in psychology could be said to represent normal science. I would say no. However, a closer discussion would have to include a much more careful analysis of Kuhn's theory and newer related works in the philosophy of science.

Psychological categories are the terms that a discipline (or a given approach) regards as its fundamental concepts. In psychology this is, for example, cognition, emotion, learning, personality, attitude, intelligence, etc. Danziger (1997) shows that around half of the fundamental concepts in psychology are constructed in the twentieth century. The rest originate from the philosophy of earlier periods. Danziger also shows that a psychology oriented towards the natural sciences tends to conceive psychological phenomena as "natural kinds", whereas modern constructivistic approaches tend to conceive them as historical products, as "human kinds".

There is a very complicated interaction between the developments of (sub)disciplines, categories, and approaches in the history of psychology. I have already indicated that each approach in a very fundamental way establishes its own subject matter. In my opinion, the analysis of the systems of the sciences must start by uncovering the most basic philosophical and theoretical assumptions and hence identifying the basic approaches or paradigms at the interdisciplinary level as well as at the disciplinary level. I find the "social constructivistic" method applied by Danziger and others absolutely necessary, but that does not mean that I am not a scientific realist. We should start our analysis with the examination of the fundamental approaches, but it would be relativistic to think that one approach is as good as any other. Reality puts limits to which approaches can survive in the long run and is a determining part in the development of knowledge (maybe to a lesser degree in the social sciences compared to the natural sciences). However, the kind of "realism" found in empiricism where it is supposed that science can uncover reality from observations alone, disregarding history and theories, I find very naïve and dangerous.

Figure 2 illustrates the possibility of analyzing each subject area in psychology from the point of view of each theoretical approach (and vice versa). In a given field (say developmental psychology) it is possible to trace the influence of behaviorism, of psychoanalysis, of cognitivism, of humanistic psychology, of activity theory, and so on. Sometimes such a mapping will be easy, sometimes difficult. Psychoanalysis concentrates on personality, motivation, and emotions. Psychoanalysis is sometimes said not to be about cognitive processes. But it is possible to write books about the psychoanalytic view on cognition, and it has been done. Each theoretical system favors some subject areas and neglects others. Even if nothing has been said directly about a given connection between an approach and an area, it is possible to generalize some principles and to draw some conclusions about these connections.

It is, however, important to realize that Figure 2 is only a purely analytical table. The table gives the impression, that these connections can be analyzed as purely external relationships. In reality (as documented in the history of psychology) there are strong internal connections between a given approach and its subject matter. It is also important to recognize the interactive character of these relationships. Developmental psychology is not only some psychological approach used in the study of the psychology of children. Child psychologists are studying a reality (something that develops), and this tends to influence their thinking and theories in a way which makes it more unlikely to develop "static" theories in this field. This again implicates that knowledge domains tend to be characterized both by the phenomena that are studied and the approach which is used to study those phenomena. This again implicates that the methods of psychology are not primarily an independent subdiscipline, but is primarily part of all subdisciplines[22].

Figure 2 **Connections between Approaches and Areas of Knowledge in Psychology**

	Behaviorism	Cognitivism	Psycho-dynamics	Phenomeno-logical Psy-chology	Gestalt-psychology	Activity theory	etc
Processes in organisms (perception, memory...)							
Developmental Psychology							
Psychology of personality							
Social Psychology							
Applied Psychologies (clinical, educational ...)							
etc.							

Our overall conclusion on this section three is that in defining psychology, its elements, methods and structure the basic theoretical approaches (or paradigms) must be taken as the point of departure. You can of course classify psychology by using purely empirical or rationalistic methods on a given set of psychological data (including bibliographical data or literary data). However, the historical development of psychology demonstrates the limitations of these approaches. Just to argue whether one set of data is useful or sufficient for an empirical or rational analysis presupposes that you use criteria which must in the end be justified by theoretical criteria of what constitutes psychological knowledge. There is no escape from deep theoretical involvement. The question is what kind of methodological approach can be applied to uncover the basic classificatory structure? And can such a methodological approach be of a certain generality so that it can be used to study the classification of other disciplines as well? My working hypothesis is that an epistemological approach is one necessary element in classification research and that it may fulfill the requirements of being sufficiently general.[23]

4. The Epistemological Basis of Psychological Theories

There is a close relationship between psychological approaches such as behaviorism, cognitivism, and psychoanalysis on the one side, and epistemological theories such as empiricism, rationalism or historicism/hermeneutics on the other. This is described in most of the traditional histories of the field. It is, however, often assumed that this link is cut when a science breaks loose from philosophy. The connection between a science and philosophy is itself an epistemological question where more positivistic theories emphasize the independence of the sciences, whereas more hermeneutic theories emphasize the connection between the sciences and their often implicit assumptions in ontology and epistemology.

It is my thesis and claim that not only the study of psychological theories should be done from an epistemological point of departure, but also that all classification research should do so. This claim must of course be defended, and the relevant contra-arguments must be considered. However, this is my present approach, and the consequence of rejecting this claim is to give up this approach to a theory of classifying subject domains. If no better approach to classification can be provided, this is a very serious problem for LIS. Therefore this claim must be considered carefully.

In Figure 3 is shown a simple table of connections between psychological approaches and their main epistemological assumptions.

Figure 3 **Connections between Theories in Psychology and Epistemology**

Basic Philosophical Position	**Basic Psychological Approach**
Empiricism/ logical positivism	Behaviorism; connectionism
Rationalism	Cognitivism; Systems theory
Hermeneutics/ phenomenology	Humanistic psychology. Psychoanalytic symbolic interpretation
Scientific Realism & Historical Materialism	Pragmatic/functionalistic psychology Cultural-historical psychology/ Activity theory
Skepticism	"Postmodern psychology"
Etc.	Etc.

Behaviorism, cognitivism, psychoanalysis, activity theory, etc., are different approaches or theories to the same phenomenon: the human mind.[24] Each of these theories implies its own subject matter for psychology and hence its own conceptual system and classification. *Behaviorism* is a psychological approach (much related to empiricism), which implies that the subject matter of psychology is behavior, learning, responses, discrimination, and so on. *Cognitivism* (related to rationalism) is an approach that implies that the subject matter of psychology is information processing of the mind, short- and long-term memory, attention, top-down and bottom-up perceptual processes. *Humanistic psychology* (related to hermeneutics) is a non-deterministic psychology emphasizing the understanding of persons by means of humanistic methods. The subject matter of psychology is seen as the analysis of concrete personalities as well as human goals, ambitions and choices. The most extreme form of humanistic psychology represents *existential psychology* (related to philosophical existentialism) where people are seen as responsible for their own existence. The basic choice for human beings is the choice between suicide or continuing to live. If people choose not to commit suicide, the next choice is whether to choose your own life or just to follow the pattern put forward by external circumstances. *Psychoanalysis* (related to hermeneutics – at least in some interpretations) is an approach that implies that the subject matter of psychology is dreams, neurosis, unconscious processes,

and symbol analysis. *Cultural-historical psychology/ activity theory* (related to pragmatism and scientific realism) implies that the subject matter of psychology is human adaptation to various physical, biological, and cultural conditions, that is how languages and cultures form human psychological capacities, processes, and personalities.

Some psychological approaches are easier to analyze from an epistemological point of view than other approaches are. Behaviorism is an example of a relatively easy approach because it is so clearly related to empiricism and logical positivism. Psychoanalysis is much more difficult. Because my suggested approach depends on whether it is in fact possible to analyze all the most important approaches, I should be able to identify the epistemological basis also of psychoanalysis. Andkjær Olsen & Køppe (1996) regard psychoanalysis as something new, which is irreducible to both mechanicism and humanism. Schultz (1988) regards Freud as the Hero of psychology, but finds that the problem with psychoanalysis is that it is not built on a realistic theory of knowledge. In appendix 4 I have provided a classification of psychoanalytic approaches based on Andkjær Olsen & Køppe (1996). I find it useful in itself (it could, for example, be applied in the PsycINFO-database). But I also think that it confirms the hypothesis about the basic role of epistemology in analyzing psychological theories.[25]

Maybe the most problematic aspect of establishing psychology as "an independent science" was the tendency to neglect philosophical studies, to regard them as obsolete and to concentrate too much on cumulating empirical facts. All empirical research depends on the theoretical outlook of the researchers, and in the case of psychology a very broad theoretical, historical and cultural outlook is necessary. The different approaches in psychology reflect the researchers' outlook, and these outlooks tend to reflect – more or less unconsciously and contradictorily – the theories of knowledge. In my opinion, we can come a long way in the understanding of psychology by analyzing this discipline from theories such as empiricism, rationalism, and historicism, even if this classification is a crude one.

Empiricism is a philosophy that favors perception and experiences. It arose, in part, together with rationalism from different ways of drawing epistemological and methodological lessons from the ongoing progress of the scientific revolution inaugurated by Copernicus and consummated by Newton. Where empiricism favors observation, rationalism has the opposite tendency and is thus a philosophy that places less relative emphasis on sensory experience and more on reasoning and a priori theorizing. Together, rationalism and empiricism constitute the two main tendencies of European philosophy in the period after Scholasticism and prior to Kant.

Empiricism saw people as born without any knowledge ("tabula rasa"), and all the knowledge an individual obtained came from the senses. Users form simple concepts from simple sense impressions. By the laws of association more complex concepts could be formed in the individual. Experiences must always be fragmentary and private.

The 20th century has been dominated by empiricist philosophy, especially by logical empiricism and logical positivism from about 1920 up to 1950. In psychology this view has especially been carried on in behaviorism, which dominated American psychology from 1913 to about 1965. This view has more recently influenced "cognitive science" in theories about neural networks and "connectionism".

Rationalism, on the other hand, saw sense experiences as a limited way to obtain knowledge. In order to perceive something, a person must already have a certain psychological makeup, which permits her to interpret the sense data. A person must have some concepts and these concepts cannot come from the senses but must be inborn (or they must develop from some pre-form, which is inborn). In modern terms: The brain must run some programs or follow some rules which determinate the fate of all input and the actions of the individual.

With the computer revolution came a new rationalist trend which dominated in the 1970s and 1980s. In psychology it dominated "the cognitive revolution" starting about 1956 with the psychologist Jerome Bruner and the linguist Noam Chomsky dominating psychology from about 1965 and culminating about 1985. It was closely connected to research in "artificial intelligence" and to the interdisciplinary field known as "the cognitive sciences". Today there is a re-evaluation and discussion about the status of this interdisciplinary trend (see Johnson & Erneling, 1997), and many people find its epistemological assumptions very problematic.

Historicism is a philosophy that emphasises that perception and thinking are always influenced by our language, culture, by our preunderstanding and "horizon", including our scientific theories. Historicism has a strong connection to the humanities where hermeneutics has been dominating for centuries. As a theory of science historicism has especially evolved as *scientific realism*, which is an evolutionary epistemology developed within American pragmatism (by Charles Sanders Peirce) and within historical materialism (by Friedrich Engels) in the 19th century.

Historicism thus agrees with rationalism in the view that our experiences are determined by our psychological make-up. However, it does not see this make-up as something inborn or common for all hu-

man beings, but rather as determined by cultural factors. Cognitivism compares the human mind with a computer and tries to explain logical thinking, the working of the memory and decision making as governed by rules which can be uncovered and used in systems with "artificial intelligence". Historicism, however, understands psychological mechanisms as culture-determined. "Logical thinking" in "developed countries" is opposed to "wild thinking" in "primitive cultures". One explanation is that the development of written language changed the cognitive functions. In cultures with written languages it is possible to compare the formal structure of sentences, whereby formal rules of logical thinking can be formulated and taught. Even members of a literate culture who have not had courses in formal logic will be affected by this new way of thinking (Goody, 1987). Such a way of explaining logical thinking is very different from a cognitivist's assumptions. In this way the psychologist Lev Vygotsky (1896-1934) sees higher cognitive functions such as memory as determined by culture. Primitive societies think more in pictures, where developed societies have a more verbal functioning of memory. The memory of small children is working by biological principles, but with the learning of a language memory begins to be working on a new higher level determined by sociocultural factors. This cognitive theory was already developed around 1930, but only today (in the 1990s) it seems to represent a main stream in American and international psychology.

In the philosophy of science historicism has been influential in the work of Thomas Kuhn (1970). His theory about scientific "paradigms" reflects how the processing of information by scientific knowledge-producers (and users) is determined by more or less conscious assumptions.[26] Kuhn's theory bridges the individual and the collective level in cognitive processes. In the 1990'ties, historicism seems to become a dominant epistemology. There are several different schools working under the broad headline of historicism, for example, hermeneutics, pragmatism, social constructivism, semiotics, and activity theory/the cultural-historical school. It is beyond the scope of this article to bring an introduction to each of these.

5. The Pragmatic Understanding of Knowledge Production

The sciences did not arise as responses to the practical needs of human beings. Rather the sciences arose in ancient history as activities connected to religious beliefs. Only with the Enlightenment (from about 1680) the belief in progress in society depending on the development of the sciences became a dominant view.

Also in the development of psychology persons such as Ernest Weber (1795-1878), Gustav Theodor Fechner (1801-1887), and Wilhelm Wundt (1832-1920) founded psychology (or rather psychophysics) on the basis of metaphysical assumptions inspired by religious beliefs, and not by the wish to produce practical knowledge (at least not primarily). Weber, Fechner & Wundt worked under metaphysical assumptions from the dualistic tradition of Descartes, in which the human mind is something totally different from the physical world. In fact the fathers of psychophysics were much inspired by the hope that their research could prove materialism wrong and provide a basis for religious beliefs. In spite of such problematic metaphysical assumptions, they succeeded in discovering some very important methods, laws and principles for psychology.

That fact that problematic metaphysical assumptions many times in the history of science have led to important scientific discoveries does not, however, mean that metaphysical assumptions do not matter. Indeed, such assumptions are very important because they are the glasses through which scientists look at the world. Such glasses can be more or less helpful or harmful. One of the very important functions of such religious beliefs has been that they allowed scientists to spend much time and energy on attacking problems without any substantiation for practical relevance. A related function has been the search for beauty, which resulting in, for example, mathematically formulated laws.

The pragmatic and functionalistic understanding of human psychology can be traced to evolutionary biology and Darwinism. This understanding is very different from dualism, which views the spirit as something different from the material world. Pragmatism understands human psychological processes and structures as parts of the adaptations of living organisms to life on earth. Perception, memory, emotions, intelligence, motivations and so on are products of three interwoven lines of development: biological development (phylogenesis), cultural development (anthropogenesis) and individual development (ontogenesis). Pragmatism/functionalism tries to understand how human psychological phenomena can be understood and explained as adaptations to the environments in their development.

A pragmatic understanding of psychology is not identical with the understanding of psychology as an applied science.[27] *Applied science* takes its point of departure from some formulated problems, for example, the selection of exceptional students for special education or the effectiveness of different methods of treatment of mental diseases. *Basic or fundamental science* however, takes as its point of departure some problems formulated by scientists themselves, and for which there

need not exist any practical utility at that moment. Basic science in psychology asks questions such as: what are the nature and cause of different perceptual illusions? How many functional memory systems exist in man (e.g., long-term memory and short-term memory)? To what degree are human mental abilities inborn, and what can twin-studies tell us about this? What determines the development of the individual personality? Psychologists who are oriented towards pragmatic epistemology can thus be either applied scientists or basic scientists or both.

The connection between basic and applied science is all but trivial in the development of psychology. In the history and philosophy of psychology there has been some interest in the philosophy of applied science (see among others Danziger, 1990 and 1997; Brocke, 1980; Hoffman & Deffenbacher, 1994; and Schonpflug, 1993). Danziger (1990, p. 120 +126) writes:

> "For the very term "*applied psychology*" reflected the myth that what psychologists put to use outside universities was based on a genuine science, much as engineers based themselves on physics. [Note 6: "The notion that technological change was due to the application of science was part of the popular rhetoric of science at the time, and psychologists were able to deploy it effectively because it was such a pervasive illusion..."].
>
> ...p. 126): "If we distinguish between the research published in the applied journals and that published in the basic journals, it is clear that during the interwar period it was only the latter group that was undergoing something like a revolutionary development. The pattern for applied-research styles had been essentially established at the end of World War I, and in the ensuing years no fundamental changes occurred. This was basically a Galtonian style of research concentrating on the distribution of psychological characteristics in natural or psychometrically constituted populations. Thus, by this time there were two quite divergent styles of psychological research in existence. One worked with data from individual subjects reacting under laboratory conditions, the other with populations surveyed statistically. The one had the weight of tradition and the mystique of the laboratory behind it, the other was buoyed up by apparent practical success and immediate social relevance".

The development of psychological knowledge is not only monodirectional from basic science over applied science to practical applications, but also in the opposite direction. Some approaches to basic research in psychology are more open to applied concerns than other approaches are. Wundt's psychology and the so-called "structuralistic" approach in American psychology were relatively uninterested in applied psychology and were also rather unfruitful for the application of psychological knowledge. With the introduction of pragmatism and functionalism came a much more fruitful exchange between theory and practice. Also psychoanalysis is known for its very close relations between theory and practice, basic and applied research.

"Applied psychology" (for example in pastoral care) can be traced far back in the history of mankind, long before the formal establishment of psychology as an independent science. According to Danziger (1997, p. 85), the newly established discipline of psychology began to annex these areas (for example child study and educational psychology) without being able to assimilate them theoretically. Thus the semantic connection between terms that designate subject areas can be more or less theoretically justified or can just represent a kind of disciplinary imperialism.

Applied perspectives can contribute with valuable perspectives to the development of a knowledge field. However, applied orientations in knowledge production do also have their great disadvantages. It is a fact in the history of science, that basic science has had tremendous practical consequences. The real and deep understanding of the nature of the mechanisms underlying phenomena is often much more valuable than the more superficial attempts to understand phenomena in the frame of some practical problems. It is, for example, better to understand the growth of the normal cell and the cancer cell than just to try one cure after another. Also the classification of phenomena in the sciences according to deep theoretical principles (as, e.g., in biological taxonomies) is in the larger perspective much more economical than just to classify according to narrow practical purposes (as, e.g., in domestic animals, pets, and pests). It is important that science can grow according to scientific needs (how they should be described may be difficult, but that is another matter). If science is too much controlled by external factors, there is a real danger that knowledge will not accumulate, that skepticism will flourish and that knowledge will become fragmented and disorganized. In this way the problem of the classification of knowledge is connected to questions regarding the working conditions of researchers and the relations between researchers and the rest of society.

Therefore a pragmatic perspective should not only understand its phenomena in a broad perspective emphasizing the understanding of the phenomena in their development and their mutual relationship with their environments. A pragmatic understanding should also emphasize the interaction between the phenomena and science itself. Science should be reflective and consider its own history. Understand how different motives and interests in science tend to give priority to certain ways at looking of the phenomena, and to analyze how scientific concepts, theories,

methods, institutions and so on can or do represent "social constructions".

A pragmatic approach to psychology is thus an approach which emphasizes the development of psychological phenomena as adaptations to the environments of organisms and persons. It also examines the motives behind psychological theories, concepts and approaches. It asks: "What practical difference does it make whether this theory is correct?" It tries to develop knowledge that is at the same time relevant for human activities and represents deep structures of reality. There is no conflict between a pragmatic view and a realistic view. On the contrary: a realistic epistemology must be based on pragmatism (pragmatic realism).

6. The Pragmatic Understanding of Classification

Just as a pragmatic view of science (e.g., of psychology) is different from an applied view, so is a pragmatic view of classification different from a view of the applications or concrete purposes of classification.

The pragmatic understanding of classification conceives a classification as a tool, and as such more suited to some purposes, goals and interests than to other purposes. A classification is never neutral, but reflects – consciously or unconsciously – certain values and views of the thing classified and the use of the classification itself. According to John Dewey a classification is objective in the sense that there exist objective standards for its goodness:

> Nevertheless there is a genuine objective standard for the goodness of special classifications. One will further the cabinetmaker in reaching his end while another will hamper him. One classification will assist the botanist in carrying on fruitfully his work of inquiry, and another will retard and confuse him. The teleological theory of classification does not therefore commit us to the notion that classes are purely verbal or purely mental. Organization is no more merely nominal or mental in any art, including the art of inquiry, than it is in a department store or railway system. The necessity of execution supplies objective criteria. Things have to be sorted out and arranged so that their grouping will promote successful action for ends. Convenience, economy and efficiency are the bases of classification, but these things are not restricted to verbal communication with others or to inner consciousness; they concern objective action. They must take effect in the world. (Dewey, 1948, pp. 151-154)

Applications of classifications are manifold. Library and information science is especially interested in classifications as tools for information retrieval in databases, for the organization of information in libraries and bibliographies, in short, as a tool for supporting the information seeking activities of staff and users. LIS is the field where most explicit interests in and analyses of the problems of classification of knowledge fields are taking place.

Another group of users of classification are publishers of great handbooks in specific disciplines (this is especially a German tradition, see appendix 5). In a more fundamental way, however, the basic organization of knowledge reveals itself in the way disciplines are organized in universities and similar institutions for the production and teaching of knowledge and in the structure of scientific publications (especially journals). The way the scientific journals classify new knowledge in their selection criteria and in their mutual delimitation reflects a basic structure of classification. This structure is, however, not explicit, but can be more or less known by researchers and by information specialists or can be analyzed by empirical studies. It should also be clear, however, that this more or less hidden structure reflects many agents' different needs, and is rather a representation of the producers' needs and possibilities than a representation that would satisfy the needs of users and information seekers. It is important to realize that the needs of different agents can be in conflict, and that a classification has to consider what kind of needs it is going to fulfill.

Just as applied science tends to make knowledge production less deep, less coherent and less well organized compared to basic science, applied classifications can be marked by some local or accidental factors which blur its deeper structure. Classification research should provide a basic approach to classification, which can then be modified in different specific applications.

LIS has been interested in both universal classifications covering all knowledge fields and in specific classifications covering a single field of knowledge. Both kinds of systems do have their justification. However, when users seek information about some specific matter, the disciplinary systems are most suited to their needs because they can display the knowledge field from a specific point of view without making compromises regarding how other disciplines would like their subjects represented. Ovesen (1989) describes how the discipline of anthropology almost disappears in the Danish Dewey System (DK5) because almost all anthropological subjects in his view are placed under subject headings which are names of other disciplines (like sociology). A universal classification always has to make compromises and to decide whose interests should primarily be taken care of. In doing so, it is of interest to know how each discipline would like to represent its field of knowledge. Therefore, I find that disciplinary classifications – the subject of this article – are of primary interest both for subject specialists and for LIS. I also see a need for general classifications, but this is beyond the scope of this article to discuss.

Regarded as a tool for information retrieval classifications have to compete with many other ways of accessing information. Today we have a lot of opportunities such as searching in titles, abstracts, fulltext, citations and so on. A theory of information retrieval should be able to specify the relative strengths and limitations of each subject point in retrieving information. Thus also to specify the relative strengths and limitations of classification codes in relation to all the other possibilities.

Seen in this way, a classification of a subject domain in a bibliographical record is represented by a symbol which can be used in identifying relevant information. Behind this symbol exists a whole classification scheme that structures the subject domain in one specific way.

In a way we have more than one classification in a database and represented in each record. Descriptors (from thesauri) are also a kind of symbols from a classification (and combinations also exist). What this article is about is the more traditional kinds of classifications which provide an overall mapping of the knowledge field in a top down fashion dividing the subject domain in a number of classes, which are then subdivided and so on. This is not the most important form for information retrieval, but it is one form among others, and it does have certain useful functions (se also Hjørland, 1998a+c).

I will conclude this section by stating that from the pragmatic point of view proposals for the classification of psychology should be evaluated by the following criteria:

- A psychological classification should represent all the most important approaches and subdisciplines in psychology (based on empirical, rationalistic, historical, and pragmatic evidence). A classification is expected to identify, label and systematize the main production of knowledge.
- A psychological classification should reflect an understanding of the history of the discipline, its different approaches, areas and perspectives.
- A psychological classification should be explicit about the view on psychology on which it is based.
- A psychological classification should reflect theoretical views on the connection between psychology and other sciences
- A psychological classification should reflect theoretical views on the connection between different subclasses/subdisciplines of psychology
- A psychological classification should avoid the reduction of psychology to either biology or sociology
- A psychological classification should – if possible – be based on a theory about the object of psychology and about its units.[28]

Research on the classification of psychology should thus include research in issues such as:

- Is "General psychology" a subdiscipline of psychology?
- Are both a sociological and a psychological "social psychology" an empirical reality? Whether or not this is the case, one should further ask: "Should there exist two or more social psychologies?" (Providing arguments pro et con and a conclusion. This conclusion could later be changed by new evidence).
- What are the relations between ethology and (animal) psychology?
- What are the relations between psychiatry and clinical psychology?
- To what degree is research in specific fields (e.g., child development) interdisciplinary?
- And so on

Classification research should analyze concrete domains as well as relationships between domains and similar patterns across different domains. Such issues are difficult and cannot be expected to be answered once and for all. If classification research does take itself seriously as research it tries to illuminate such problems without jumping to too fast conclusions. Practical classifications should be made all the time building on the accumulated knowledge at the time of construction (and should be evaluated on that background). The essential result of research in classification should not as much be seen as concrete classifications as a repertoire of arguments for and against different ways of classifying different subject domains.

Classification research should build on a realist epistemology and should never be regarded as finished. Real breakthroughs in the classification of the sciences are rare (e.g., Linné's botanical system, the atomic system of Rutherford and Bohr and recent changes in biological taxonomies) and are connected with theoretical breakthroughs in the sciences. Classifications are, however, not only a result of research in the single sciences. Research in classification can also stimulate scientific development. The specific sciences are not independent of philosophy or of knowledge about and views on classification.

7. Some Concrete Psychological Classifications

In the appendixes to this paper are shown some specific classifications for psychology.[29]

- Two dispositions by major German "Handbücher" (Graumann et al., 1981-; Balmer et al., 1976-1981) (Appendix 4)
- The one used in PsycINFO (a database with more than 1.500.000 records by 1998) in 1998 and 1986 (appendix 6a+b)

- One made by the present author for a union catalog for Danish psychological literature in Denmark (Hjørland, 1980; appendix 7)

This section will comment on these specific classifications in order to illuminate some general principles or tendencies of the classification of psychology (and about classification in general). These comments are not intended as actual suggestions for revision of those systems. In that case a much more detailed examination and analysis should be made.

My first comment is that – as far as I know – designers of such classifications have not made use of research done in LIS (!) The knowledge used is mainly based on actual experience with the material to be classified (which is NOT identical with subject knowledge in, for example, psychology as this is taught at universities, even though such subject knowledge is supposed to be helpful). In addition a very small amount of logical principles may be applied. This raises the important question whether such classifications can benefit from research done in LIS? (And what kind of research that might be helpful). In order to answer this question we should know whether these classifications are fulfilling their aims, or can be criticized. In other words, we should develop some criteria as how to evaluate and improve such classifications.

My second comment is that there is – at the most overall level – a similarity in the structures. Such classification almost always starts with the metadisciplinary classes (such as the history and methods of the discipline) then goes to the basic discipline and finally the applied areas. Throughout the classifications there is a tendency to go from the more general to the more specific aspects (we shall return to the important question of what "general" means in relation to psychological phenomena).[30]

My third comment is that the disposition of two German handbooks (Graumann et al., 1981-; Balmer et al., 1976-1981) from the same period illustrates that the same classificatory task can be tackled in very different ways. Of course many differences in specific classifications are always arbitrary, and we cannot draw general conclusions or learn important principles from accidental properties. We have to search for essential characteristics. That means that we have to go from the surface of things (or classifications) to their deeper nature – a principle derived from realist epistemology and in strict opposition to empiristic epistemology. One such accidental property might be that Balmer et al. (1976-1981) is more populist because it uses the names of the most well-known researchers in psychology as labels for specific volumes and thus also as subject headings. Behind such "accidental" differences between the two German handbooks it is my claim that a more general principle can be demonstrated. Balmer et al. tends to integrate the subject matter of psychology in the different psychological traditions, whereas Graumann et al. tends to focus on knowledge fields in abstraction from theoretical approaches. In my opinion Balmer's approach is the most organic one, whereas Grauman's is a more positivistic approach to classification. *Thus the classification of psychology in these two specific examples can in my opinion confirm the influence of different epistemological theories (related to empiricism and historicism, respectively). It confirms that different views of knowledge do influence the way people organize knowledge and may be the only general principle on which to base a theory of classification.*

My fourth comment concerns the fine-gradedness of the classifications. *PsycINFO* has 155 different subject headings (omitting those without a verbal description) and is thus one of the most enumerated classifications on this subject (see appendix 6). In 1986 the same database had only 81 classes. The expansion was introduced when the database corrected an old sin of omission not to index monographs. First monographs (including chapters) were indexed in a special bibliography, *PsycBOOKS* (in print, later only electronic, later again integrated in the PsycINFO database). We have thus every reason to believe that the current and relative finely graded classification was developed as a way of presenting the records in the printed volumes of PsycBOOKS (which were one-year cumulations opposed to Psychological Abstracts' monthly cumulations). Printed monthly abstract journals like Psychological Abstracts (1927-) are classified in order to permit the users to scan the table of contents each month. However, when the Abstracts are bound in cumulated volumes in libraries, the organization of the bound volumes remains month by month classified. Retrospective searches for specific subjects can easily be done in the electronic versions, but in my opinion this system does not satisfy the need to browse, the need to have a finely-graded classification of large cumulations. To search information electronically by using descriptors and other forms of access has been characterized as peeking into a room through the keyhole. Cumulated bibliographies (as well as other kind of cumulations, e.g., collected works) can sometimes display *a beauty*, which stands in contrast to such keyhole feeling. The lack of such cumulated subject bibliographies with finely-graded classifications might add to the feeling of lack of coherence in the discipline. Each researcher looses his impression of contributing specific knowledge to a larger structure. In my opinion psychology needs a much more finely-graded classification than the 155 classes in PsycINFO if this need is to be satisfied.

My fifth comment turns this problem the other way round and hypothesizes that this classification is not intended to play a significant role in on-line searching. What specific role does this classification play in electronic retrieval? Even though some records have more than one classification code[31] one characteristic of classifications compared to descriptors is that they tend to provide a structure where each document has one definite place. This allows for another kind of searching behavior which is more like browsing and navigating than keyholing. Classification codes tend to give *general knowledge* about a concept, whereas descriptor searching tends to identify more, but also much more specific knowledge.

In is very surprising that the classification in PsycINFO does not contain any classes for children, adolescents or adults (but one for older people (SH=2860)). This must be seen from the fact that the database some years ago made a retroconversion so that each record was given a new field displaying age groups.[32] I am not sure this was a good solution or whether it does not make navigating unclear. It makes it more difficult to evaluate the classification in its own right. It also gives rise to two different criteria of subdivision in class 2800 and thus to confusion about whether 2820 cognitive development contains cognitive development in older people or not.

In my opinion classifications of the kind discussed here do have important functions to play both in on-line retrieval, in printed cumulative bibliographies and as independent "maps" of a subject domain. However, in information retrieval they have been regarded as the opposite of user-friendly (because the users have to remember the classification codes or to look them up during on-line retrieval, which can be a stressful and complicated situation even without this task). Also classification-based retrieval came to look old-fashioned and ineffective compared to free text searching at the start of modern information retrieval. That may be the main reasons why they are today relatively underdeveloped.

My sixth comment will be that the classifications lack the understanding of psychology, which I asked for in section 6 above. I shall give some critical comments based on an analysis of PsycINFO. *Approaches to psychology are almost totally lacking.* Only 2140 "History and Systems", 3143 Psychoanalytic theory and a few groups in clinical intervention are explicitly concerned with different theoretical views. However, most people interested in psychology approach the subject with some theoretical favorites or dislikes or views they would like to know more about. A detailed classification of theoretical approaches to psychology is in my opinion mandatory to serve all three purposes plus (especially) all the people who have never thought about how theory-laden all subject domains in psychology actually are!

Many of the subject headings in the classification are names of non-psychological disciplines (e.g., statistics, genetics, literature, philosophy, linguistics, and robotics). Many more are names of interdisciplinary areas, in which psychology is only one of many contributors (e.g., gerontology, mass media, marriage & family, and so on). All this adds to a feeling that this is not a classification that reflects a view of psychology, but just a collection of loosely related themes without deeper internal connections. This is of course not only – or not primarily – a criticism of the designers of the PsycINFO-classification, but of mainstream psychology as such (as analyzed so brilliantly by Danziger, 1997). Even then PsycINFO should make their classification reflect an understanding of psychology to a higher degree.[33]

One of the most important things is to analyze the relation between subject areas and approaches. What is what, and what provides the basic rule for placement? In my opinion "2390 Parapsychology" should not be regarded as a subject area in psychology, but as an extreme non-materialistic (or dualistic) assumption, for which reason it should be relocated to "2140 Systems". In the same way different ways of testing in psychology (e.g., neuropsychological testing and educational measurement) should be relocated to the respective areas of psychology because methods should reflect their object, not the other way round. This is again about going from the surface of things to their deeper nature.

As written above the main structure is Metadisciplines, Basic Science and Applied Science. Below this level, there is in the Basic Science part a (hidden) substructure going from the general to the specific. The first heading is "2100 (General psychology)[34]". But what is "General Psychology"? and what is general in psychology?

At one time in the history of psychology (or rather by some systems of psychology) it was assumed that basic psychological processes like perception, memory, learning, and emotions were based on physiological principles which were common to all human beings, and therefore general or universal.[35] This is in my opinion an untenable and obsolete theory, but it is the background for the term "general psychology" as covering experimental psychology. So from this position the classifications of psychology are per tradition arranged beginning with the more biologically oriented fields towards the more socio-cultural fields.[36]

Much more could of course be said of these concrete classifications. One subdiscipline in psychology is "Differential psychology". This is not represented in PsycINFO, and an important discussion of the nature of this discipline could be done (see Asendorph,

1991 for one analysis). Each such analysis teaches us important lessons about psychology with important consequences for the understanding of its cognitive organization.

8. Conclusion

I have tried to give a broad outline of psychology and the problems of its classification. My intention has been both to say something important about psychology and to contribute to the methods of classification research as part of information science. This has been done by formulating as many explicit principles and theses as possible. My main assumptions have been that classifications are not neutral tools but reflect a view of the subject domain to be classified. Different views, paradigms or approaches exist in every subject domain, and these views have at the deepest level a strong connection to basic theories in ontology and epistemology. Therefore basic epistemological theories like empiricism, rationalism, historicism, and pragmatism can provide a basis for the classification of knowledge fields.

The overall picture of traditional mainstream psychology shows a discipline with immense worldly success, but at the same time a very fragmented discipline without a satisfactory theoretical framework. The main problem for psychology is its tendency to be reduced to either biology or sociology. The most promising theory for a united psychology seems to be "activity theory". This theory has the potential of transforming the psychological system of subdisciplines and the relations between psychology and other disciplines.

Research on the classification of knowledge fields must itself be based on ontological and epistemological theories. Here it is my claim that empiristic and rationalistic theories have so far been very dominating, but that the broad family of historically and culturally oriented epistemologies has much to contribute.

It is evident that other researchers may continue this work. Very many dissertations may be written about epistemological and psychological theories and their historical development, (indeed this might be a reason why few researchers today dare try to contribute to such problems). In my opinion it is important that sciences do not disappear in fragmented knowledge, but try to understand the major lines in the development, structure and organization of knowledge. Isn't this what research in knowledge organization and classification should be about?

Research on classification of knowledge should be relevant for practical purposes like information retrieval. I have tried to outline how research done by using the suggested approach can improve practical library and information services. I do not find that work in the classification field can be done once and for all, but that it should be a continuous activity, which ensures that the value added information provided by information specialists is of such a quality that the users find it relevant. LIS does have a basic structure of institutions, researchers, journals, and so on. I think we should play a stronger role in classification. Not in monopolizing it but in coordinating research and development. Making our journals relevant for people who seek information about the organization of knowledge. This article is an attempt to do just that.

Appendix 1

Empirical Approaches to the Classification of Psychology

Empiricism is a philosophy that claims that all knowledge originates from the observations made by individual human beings. All kinds of knowledge established by traditions or inborn in humans are regarded with great skepticism. All knowledge based on experience concerns something particular (isolated); empirical knowledge is therefore fragmented. Empiricism seeks to establish general knowledge through induction made from observed data. For the empiricist there is no necessity in the world, everything that is observed could be different in new observations.

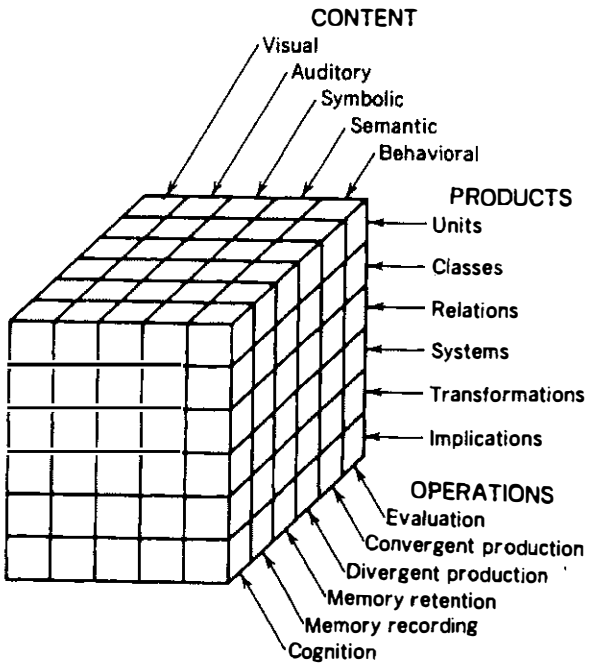
The twentieth century has been much dominated by empiricism (in the form of logical empiricism/logical positivism) and not least in psychology and in information retrieval theory. The prevailing approach to psychology has been behaviorism, which represents an extreme empiristic view of human nature. In spite of its influence, most philosophers of science agree that empiricism/positivism is in very great trouble and has been so at least since about 1950.

Even though empiricism and behaviorism are extremely skeptical towards all forms of inborn knowledge or cognitive functioning, intelligence testing has flourished. Among the methods developed to work with statistical data in psychology is a specific classificatory method known as *factor analysis*. This method has later been exported to many other sciences including information science.

Psychologists have tried to define basic categories of intelligence and to classify kinds of human talents and performances. One method has been by using factor analysis of a huge amount of empirical scores in intelligence tests. One well known example is Guilford's "structure-of-intellect" model describing 120 facets of intelligence, which were later expanded to 180 (Guilford, 1967, 1982). This program has been carried out in a very large scale, but has not been able to maintain the initial optimism with which it was associated. A newer program also building on strictly

empirical methods is *connectionism* where neural networks are taught to categorize input and to react accordingly. This program has also lost much of the initial optimism with which it has been associated.

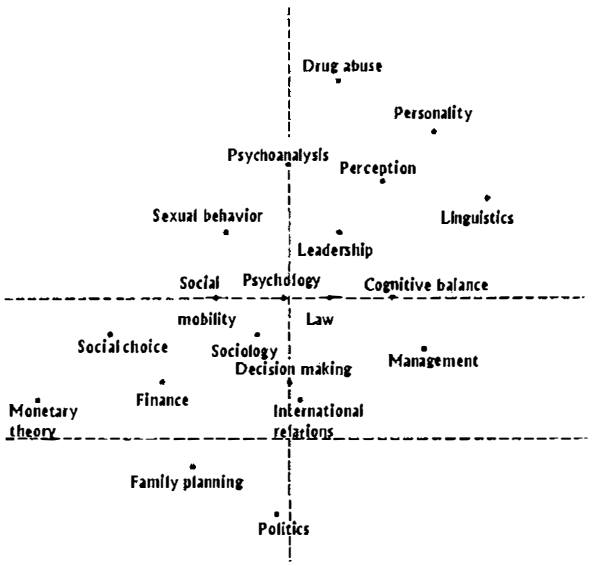
The problems with these kinds of classificatory methods are intimately connected to basic problems in empiricism. Empiricism neglects the fact that every experience does not only depend on the things experienced but also on the organism making the observations. Not even the simplest observations can be made without an organism capable of categorizing and interpreting the observations. On the basis of a given set of empirical data many different generalizations can be made. That depends on which attributes are chosen as the most relevant characteristics. Empirical classifications rest on "similarity" or "resemblance". What one should regard as "similar" data is, however, not a question which empiricism itself can answer. In fact it turns into a question concerning the purpose and aim of the classification. Observations are theory-driven, and so are classifications.



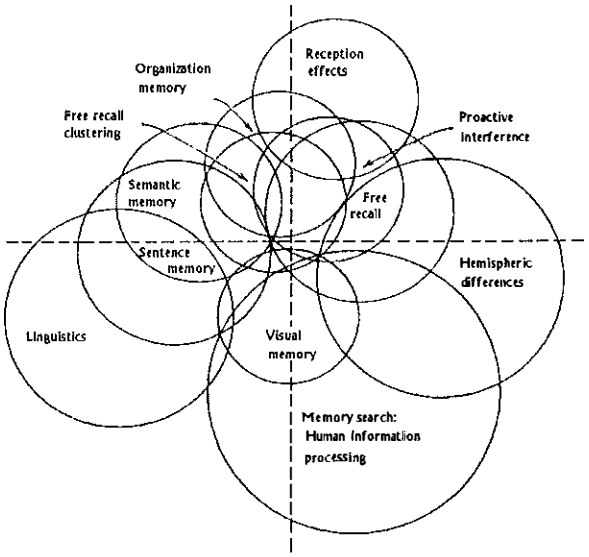
Guilford's "structure-of-intellect"-model (Guilford, 1967)

The empirical methods of the classification of literature have especially been used in the bibliometric tradition by using the citation indexes as the database. Concrete examples can be found in Garfield (1976, 1979 & 1992; see examples in figures below). The strengths and limitations of this approach in information science is discussed in more detail in Hjørland, 1997.

Also algorithms in information retrieval are actually used to classify the literature in a database into sets of relevant/non-relevant records. Such techniques must therefore share the same fundamental problems as all methods using purely empiristic methods do.



A bibliometric two-dimensional plot of 20 largest social science clusters (from Garfiel, 1979, p. 140, fig. 8.31)



A Bibliometric diagram of memory and learning macrocluster (from Garfield, 1979, p. 142, fig. 8.33)

Appendix 2

Rationalistic Approaches to the Classification of Psychology

Rationalism is a philosophy which emphasises reasoning and a priori theorizing. Rationalism is – like empiricism – an objectivistic, reductionistic, foundationalistic, ahistorical and apolitical approach. Rationalism analyzes concepts from a logical point of view and tries to organize concepts in one all-embracing structure. In knowledge classification it tries to classify all sciences in one all-embracing structure. This structure is objective, and does not depend on different points of view, purposes or interests. Classification that is based purely on logical division into mutual exclusive and exhaustive classes reflects a rationalistic approach. The facet-analytic tradition in classification research is the most typical representative of rationalism.

Theories of language, concepts and thoughts which try to identify an "absolute syntax" or universal laws and principles that do not depend on the context or cultural background of the users are rationalistic by nature. Rationalism finds that the predisposition to realize basic concepts that do not originate from experience must be inborn. It is our inborn way of forming concepts which determines the essential connections between the things we can learn. The rationalistic point of view also presumes that some kind of abstract analysis or fixed procedure could be used to penetrate the surface of documents, thereby revealing their true subjects. Its method is characterized by the tendency to formulate and follow rules and principles. According to rationalism it is possible to organize knowledge in axioms, definitions and theorems in every domain of knowledge.

Below is given some illustrations of how to apply the rationalistic method to classify psychological knowledge. A comprehensive critique of the limitations of this approach (and of the concrete examples) will not be given in this appendix. It should, however, be evident that rationalism on the one hand has problems in relating its theoretical approach to empirical reality (it lacks an empirical foundation). On the other hand rationalism has problems in its claim on the non-historical character and the disinterestedness of the relationships between concepts. Rationalism presupposes that the principles of division are of an external character, that subject matter is not formed by organic relations of an internal character. The inherent limitations will be evident in the comparison with the other approaches.

A Facet Analysis of Psychology

In Hjørland (1997) I have argued that the theory of facet analysis in LIS classification developed by Ranganathan, the British "Classification Research Group" and others can be interpreted as a typical rationalistic method for the development of a classification scheme. Mills & Broughton (1978) represents the best attempt to apply this method to developing a classification of psychology. In Hjørland (1988) I designed – inspired by Mills & Broughton (1978) – the following facet model for psychology. A more detailed discussion can be found in Hjørland (1988).

Facet 1: Research methods
Facet 2: Theoretical orientation
Facet 3: Time, place and form
Facet 4: Psychological processes
Facet 5: Psychobiology
Facet 6: Individuals and personality
Facet 7: Social and cultural conditions
Facet 8: Sphere of application

Facet model for
the classification of psychology
Hjørland (1988)

This model can of course be further elaborated. For example, Facet 7 could be subdivided according to a kind of "systems approach" to the social systems, of which the individual is a part, and which influences the individual. Possible levels could be:

The individual person
The dyad
Families
Small groups
Organizations
Communities
Countries
Cultures

These levels can be treated top down or bottom up. The chosen approach is related to epistemological issues regarding "methodological individualism" versus "methodological collectivism" in psychology and the social sciences.

Mills & Broughton (1978).
Bliss Bibliographic Classification. 2. Ed.

Class I: Psychology and Psychiatry. Outline

I	PSYCHOLOGY
IAA	Philosophical Concepts (as Philosophy AA/AI)
IAJ	Schools of psychology
IAK	Psycho-analysis
IAR	Behaviourism
IB	Research and experiment, experimental psychology
IBN	Tests, measurement, assessment, scales
IC	Animal psychology
ICC	Human psychological processes and attributes, behaviour
ICD	Influences, determinants, environment
ICE	Stress (general)
ICE X	Physical, physiographical factors
ICI	Biological factors, physiological psychology, psychosomatics
ICJ	Psychological factors (as IC/IX)
ICK	Social factors
ICL B	(Attributes of psychological processes) Norms, variations.... (Types of processes)
ICM	Developmental, psychogenesis (general)
ICM R	Differentiation (general)
ICP	Sensation and perception, sensory processes
ICQ	Stimulus and response (general)
ICT	(Types of response)
ICV	Conditional reflexes, conditioning
ID	Perceptual and motor processes, sensorimotor activity
IDD	Ability, aptitudes, skills, intelligence
IDJ	Performance, achievement
IDQ	Senses: proprioceptive, someathetic, visual...
IE	Motor, psychomotor processes
IEH	Motivation, drives, desires
IEJ	Involuntary behaviour, instincts, habits
IEN	Voluntary actions
IEV	Will, volition, choice, decision
IF	Affective psychology: emotions, feelings
IFG	(Types of emotion)
IFK	Cognitive, higher mental processes
IFM	Associative processes, concept formation
IFQ X	Ideation
IFR	Imagination, symbolism, imagery, intuition
IFV	Learning and memory
IFW	Memory
IG	Learning
IGM	Conditioned learning
IH	Thinking, reasoning, judgment, problem solving
IHT	Parapsychology: hypnotism, ESP...
IJ	The Subconscious and Unconscious, depth psychology
IJK	Subconscious, extraconscious
IJL	Defense mechanisms
IJP	Unconscious, sleep, dreams
IJV	The individual, individual psychology
IJW	Self concept, personal identity
IK	Personality, character, temperament
IKA W	Personal construct theory
IKK	Traits, characteristics
IKM B	Psychoanalytic personality factors: Id, Ego ...
IKO	Differential psychology, individual differences
IKO T	Typologies, types of persons
IKQ	The sexes, sex psychology
IKS	Sex behaviour
IL	Types of persons other than by sex or age (by deprivation, occupation, religion, family membership...)
ILK	(By age) Developmental psychology
ILY	Age, age groups
IM	Children, child psychology
IMM	The family, family relations
IMN	(Particular ages) Infants, adolescents...
IMU	Handicapped persons
IMV	Exceptional persons: geniuses...
IN	Social psychology, social behaviour
INL	Attitudes...conformity...power and influence...
INO	Social interaction
INP	Interpersonal interaction
IO	Communication
IOP F	Signs, symbols
IOR	Verbal, language
IOV	Media: audience, information
IP	Socialisation
IPR	Differentiation and stratification, roles
IPY	Psychology of everyday life (clothes, appearance...)
IQ	Groups
IQR	Group dynamics
IQS J	Types of groups

IQV	Etnopsychology: national, racial, cultural
IQY	(By types of persons) (As IK/IM)
IRC	Applied psychology
	(Applied psychology)
IRD	Clinical psychology (general)
IRE	Mental health, hygiene
IRF	Medical psychology, psychiatry, abnormal psychology, psychopathology
IRF RY	Therapeutic environments
IRF T	Hospitals, clinics ...
IRG	Psychiatric practice, clinical action
IRJ	Diagnosis, systems
ISB	Types of treatment, therapy
ISF	Community mental health
ISG	Physical
ISH	Drug therapy, pharmaco-therapy
ISP	Psychotherapy
ISR K	Psycho-analysis, analytical psychotherapy
ISW	Group therapy
ISY	Brief psycho-therapy
IUB	Mental disorders, types of disorders
IUB R	Nature of mental illness, aetiology
	(By cause)
IUM	Organic, physical causes
	**Alternative* (preferred in Class H Medicine)
	(By cause and manifestation)
IUN	Mental retardation, idiocy, imbecility...
IUO N	Psychosomatics **Alternative* (preferred in Class H Medicine)
IUP	(Disorders of psychological processes) (as IA/IQ)
IUP G	Learning disorders
IUP O	Communication disorders, aphasia
IUY	Autism
IVB	Psychoses
IVC	Organic psychoses: toxic ...
IVC Y	Functional
IVD	Affective: manio-depressive...
IVH	Paranoia
IVN	Schizophrenia
IVQ	Neuroses
IVR	Anxiety neuroses
IVS	Hysterical neuroses
IVT	Phobic neuroses, phobias
IWB	Personality disorders: psychopaths...
IWD	Behavioural disorders, psychopathology
IWX B	Non-psychiatric conditions
IWX P	Types of persons, psychiatric patients
IWX W	(By sex) (as IKW/IKX)
IWY	(By various characteristics) e.g. Socially deprived... (as IL)
	(By age)
IX	Children (as IM)
IY	Other applied psychologies
	*Alternative (divided like whole classification – e.g. Psychology of law IYS)

* This is an inverted schedule and filing order of facets & arrays is the reverse of their citation order.

*- Compound classes are built by retroactive synthesis – terms lover in schedule cite first – e.g.:

- Personality traits in children = Children – personality traits IMK K;
- Group therapy in paranoia = Paranoia – Group therapy IVH SW;
- Performance measurement with the mental retarded = Mental retarded – Performance
- Measurement IUN DJB N

A Dichotomy Classification of Psychology

Below is shown a dichotomy classification of psychology. These rationalistic principles of division can be found in many concrete classifications. They have, however, great difficulties in dealing with the internal relationships in the subdisciplines of psychology. They display formal relationships, not organic relations.

Human psychology
- Theoretical psychology
  - "General psychology"
    - "Individual psychology"
      - Adult psychology
        - Higher psychological processes
          - Cognitive psychology
            - Experimental psychology
              - Positivistic psychology
              - Non-positivistic psychology
            - Non-experimental psychology
          - Emotional & motivational psychology
        - Lower psychological processes
      - Child & adolescent psychology
    - Social psychology
  - Cultural psychology
- Applied psychology

Animal psychology

Appendix 3

Major Theoretical Approaches in the History of Modern Psychology

Psychophysics/Structuralism (1879-1920)

Founded by Ernest Weber (1795-1878), Gustav Theodor Fechner (1801-1887) and Wilhelm Wundt (1832-1920). Wundt founded the first psychological laboratory in Leipzig 1879. In America Edward Bradford Titchener (1867-1927) saw himself as a true successor of Wundt (but in fact he altered Wundt's views dramatically). The term "structuralism" was coined by Titchener (Not to be confused with the later structuralism inspired by the linguist Ferdinand de Saussure, a movement that also Jean Piaget felt himself associated with). The influence of structuralism declined with the breakthrough of behaviorism about 1913 and it almost disappeared with the death of Titchener 1927.

Functionalism/Pragmatism (1896-1930)

Pragmatism as philosophy was founded by Charles Sanders Pierce (1839-1914). It was supported and continued by William James (1842-1910) and John Dewey 1859-1952). James and Dewey developed the pragmatic approach in psychology. Pragmatism was in the USA an alternative approach to Titchner's "Structuralism" from about 1896 until it was gradually replaced by behaviorism from about 1913 to 1930. It is closely related to the functionalistic school in Chicago at the end of the nineteenth century and influenced by John Dewey and James R. Angell.

However, pragmatic and functionalistic approaches have influenced psychology outside the explicit schools from Charles Darwin and until this day. Today we see a revival or "neo-pragmatic" tendency. Schultz & Schultz (1996) mention James, Hall, Angell, Cattell, Woodworth & Carr under this heading. They find that functionalism disappeared about 1950.

Psychoanalysis/Depth Psychology (1895-)

Founded by Sigmund Freud (1856-1939) about 1895. Has gradually influenced academic psychology. It has divided itself in a large number of competing schools. According to Schultz and Schultz (1996, inside cover) it disappeared about 1975. In my opinion, however, it is still an important approach in psychology (see also appendix 4). (The term "psychoanalysis" does not include the psychology of C. G. Jung. The term "Depth psychology" is suggested as a generic term including psychoanalysis, the analytic psychology of Jung, and others).

Behaviorism (1913-1965*)

John B. Watson's "manifest" for a behaviorist psychology from 1913 can be pointed out as a formal establishment of the behaviorist movement, even such persons as Pavlov and Thorndike had contributed essentially at an earlier time. About 1965 behaviorism seemed to be succeeded by cognitivism. However, essential characteristics of behaviorism have, since about 1930 and until now, influenced psychology according to Danziger (1997). This is a broad, eclectic, implicit "variable psychology". According to Danziger all modern psychology has adapted the basic views of behaviorism, which has become "the language of psychology" even among psychologists who do not regard themselves as behaviorists.

Byrne (1995, p. 132) writes: "Introductory texts in the philosophy of mind often begin with a discussion of behaviorism, presented as one of the few theories of mind that have been conclusively refuted. But matters are not that simple: behaviorism, in one form or another, is still alive and kicking".

Phenomenological psychology (1912-1940)

Philosophically related to phenomenology as founded year 1900 by Edmund Husserl (1859-1938),

but in experimental psychology an approach related to Gestalt psychology. The Danish psychologist Edgar Rubin (1876-1951) wrote in 1915 a famous book about visual perception in which he described the figure and ground phenomena. In Europe phenomenology remained an important philosophy until the start of World War II (1940), where it was forced out by analytical philosophy.

Since then phenomenological psychology has internationally remained a small enclave. In Copenhagen the influence of phenomenological psychology is still perceptible In the USA "Journal of Phenomenological Psychology" was founded in 1970. Today the influence of phenomenology tends to increase.

Gestalt psychology (1912-1940)

Gestalt psychology is rooted in phenomenological philosophy (Franz Brentano, 1838-1917 and Edmund Husserl). The term "gestalt quality" was first coined by C. von Ehrenfels in 1890 (a student of Brentano). It became a formal school of psychology in 1912 when M. Wertheimer, Wolfgang Köhler and Kurt Koffka studied apparent movements using stroboscopic experiments. It subsequently headquartered in Berlin.

Humanistic Psychology (1962-)

Humanistic psychology was established as an approach in modern psychology with an independent organization and journals from 1962. *("Association for Humanistic Psychology" and "Journal of Humanistic Psychology").* Abraham Maslow (1908-1970) belongs to the pioneers of this movement. Humanistic psychology was founded as "the third force", in explicit dissatisfaction with both behaviorism and psychoanalysis (especially the deterministic view of human nature). It based itself on principles from the philosophy of humanism (which goes back to the latter half of the fifteenth century).

The history of psychology might be reinterpreted from a humanist point of view. It is rooted in the *renaissance* and in a continental European tradition with names such as Gottfried Wilhelm Leibniz (1646-1716), Immanuel Kant (1724-1804), Søren Aabye Kierkegaard (1813-1855), Wilhelm Dilthey (1833-1911), Edmund Husserl (1859-1938), William James (1842-1910), William Stern (1871-1938), Carl Rogers (1902-1986), Rollo May (1909-), Abraham Maslow (1908-1970), and Gordon W. Allport (1897-1967).

According to Schultz & Schultz (1996, inside cover) humanistic psychology disappeared as an approach in psychology about 1985. In my opinion, however, humanistic psychology (including existentialism) is still influential in psychology.

Genetic Epistemology (1960-1990)

Founded by Jean Piaget (1896-1980). The first books by Piaget were published in the 1920'ties, but his international influence (especially in the USA) became dominant about 1960. It culminated with the death of Piaget in 1980. Since then Piaget's influence has decreased. An important "neo-piagetian" enclave is still influential.

Cognitivism (1965-)

Cognitivism is an approach influenced by information theory, cybernetics, and systems theory (developed around 1948). As a starting point the year 1956 may be mentioned. This year Jerome Bruner published "A Study of Thinking" and Chomsky's "Logical Structure of Linguistic Theory" circulated in a preliminary edition.

This approach developed very forcefully, and was from 1965 the dominant view in American and International psychology. One of the pioneers, Herbert A. Simon received the Nobel price (1978 in Economics).

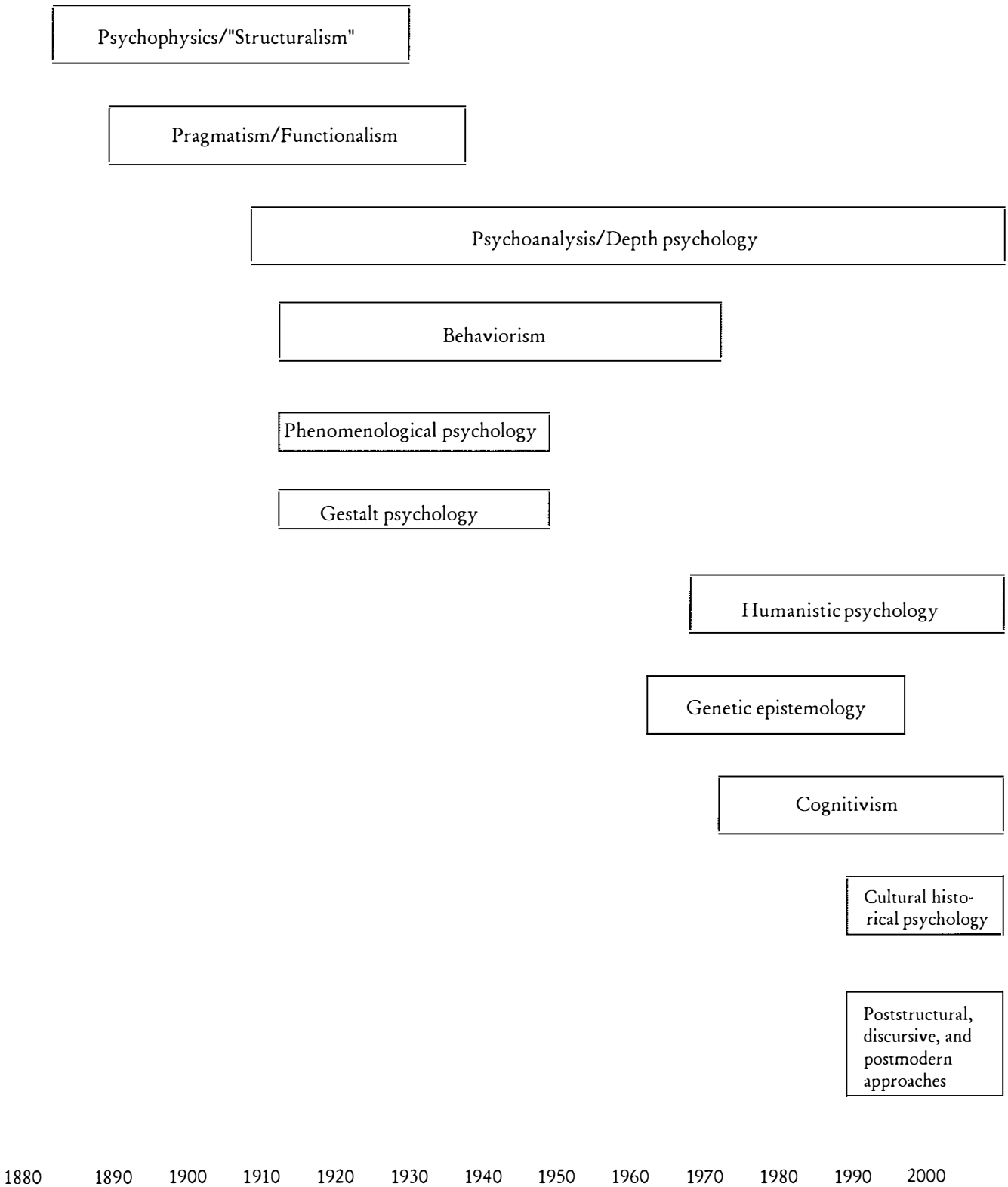
From the late 1980'ties this approach has been met with increasing criticism, and its influence has markedly decreased. Among the critics are also pioneers as Jerome Bruner and Ulrich Neisser.

Cultural historical psychology/Activity theory (1990-)

Founded as a school of psychology in Russia by Lev. S. Vygotsky (1896-1934), A. N. Leontjev (1903-1979), and A. R. Luria (1902-1977). It was suppressed in the Stalinist period but regained influence in the Soviet Union during the thaw. Later it first influenced European and then American psychology. In the 1990'ties it has become a mainstream in international psychology. It is related to American pragmatism.

Poststructural psychology/Discursive psychology/ Postmodern psychology (1990-)

In the 1990s psychology is increasingly orienting itself towards broader tendencies in philosophy and culture. Poststructuralism (especially Michael Foucault, 1926-1984), discursive psychology, narrative psychology, "social constructivism" and postmodern thoughts are important influences in modern psychology. Their main characteristics are a historical and a sociocultural turn and a rejection of the individualistic metaphysics which have dominated psychology since René Decartes (1596-1650) and Emmanuel Kant (1724-1804).



Timetable. Modern approaches to psychology.

Appendix 4

Approaches to Psychoanalysis
(Based on Andkjær Olsen & Simo Køppe, 1996, page 61-67)

(1) *Orthodox (dogmatic) Freudian psychoanalysis.*
Examples: Kurt Eissler (Director of the Freud-archive in New York) and Humberto Nagera (member of the Anna Freud group)

(2) *Object-relation theories.*
- The British object relation theories.
  Ancestor: Sándor Ferenczi, founded in England by Melanie Klein and Michael Balint. Adopted by Ronald Fairbairn and Donald Winnicott. The Tavistock tradition. Modern contributors: Wilfred Bion and Donald Meltzer.
- The American Self psychology
  Heinz Kohut and Otto Kernberg

(3) *Theories influenced by the positivistic theory of science.*
- Ego psychology in the USA
  Heinz Hartmann
- "The aggressive critics"
  (e.g., Adolf Grünbaum)
- The empirical infant research

(4) *Theories with focus on socialization and interaction.*
- The empirical infant research
- The Freudo-marxists
- The American culturalists
- The psychosomatic researchers

(5) *Theories influenced by the phenomenological and hermeneutical tradition.*
- Ludwig Binswanger
- Karl-Otto Apel, Jürgen Habermas & Paul Ricæur
- Roy Schafer
- Alfred Lorenzer

(6) *Theories influenced by linguistic structuralism.*
- Jacques Lacan

Appendix 5

CLASSIFICATIONS USED BY TWO GERMAN "HANDBÜCHER"
(Graumann et al. 1- <88>, 1981-; and Balmer et al. 1-16, 1976-1981)

1. PLAN FOR "ENZYKLOPÄDIE DER PSYCHOLOGIE"
Graumann et al. 1- <88>, 1981-

(* = Volumes published on 1998)

THEMENBEREICH A
GESCHICHTE UND STELLUNG DER PSYCHOLOGIE INNERHALB DER WISSENSCHAFTEN

Serie I: Geschichte der Psychologie

Bd.1: Geschichte der Psychologie I (bis zur Mitte des 19.Jahrhunderts).
Bd.2: Geschichte der Psychologie II (bis zum frühen 20.Jahrhundert).
Bd.3: Geschichte der Psychologie III (im 20. jJhrhundert).

Serie II: Die Psychologie innerhalb der Wissenschaften

Bd.1: Psychologie und Philosophie.
Bd.2: Psychologie und biologische Wissenschaften.
Bd.3: Psychologie und Sozialwissenschaften.

Serie III: Begriffswörterbuch der Psychologie

(3-4 Bände).

THEMENBEREICH B
METHODOLOGIE UND METHODEN

Serie I: Forschungsmethoden der Psychologie

*Bd.1: Methodologische Grundlagen der Psychologie
*Bd.2: Datenerhebung.(1982)
*Bd.3: Messen und Testen.(1983)
*Bd.4: Strukturierung und Reduzierung von Daten. (1982)
*Bd.5: Hypotesenprüfung.(1982)

Serie II: Psychologische Diagnostik

*Bd.1: Grundlagen psychologischer Diagnostik. (1982)
*Bd.2: Intelligenz- und Leistungsdiagnostik.(1982)
*Bd.3: Persönlichkeitsdiagnostik.(1982)
*Bd.4: Verhaltensdiagnostik.(1982)

Serie III: Psychologische Interventionsmethoden

Bd.1: Pädagogisch-psychologische Interventionsmethoden.
Bd.2: Psychotherapeutische Methoden I
Bd.3: Psychotherapeutische Methoden II
Bd.4: Rehabilitationsmethoden.

Serie IV: Evaluationsforschung

Bd.1: Evaluationsforschung: Modelle und Methoden.
Bd.2: Evaluationsforschung: Anwendungen.

THEMENBEREICH C
THEORIE UND FORSCHUNG

Serie I: Biologische Psychologie

*Bd.1: Grundlagen der Neuropsychologie. (1996)
*Bd.2: Klinische Neuropsychologie.
Bd.3: Psychophysiologie des Lernens und des Gedächtnisses.
Bd.4: Biopsychologie der Emotion.
*Bd.5: Ergebnisse und Anwendungen der Psychophysiologie
Bd.6: Psychophysiologie der Motorik.

Serie II: Kognition

*Bd.1: Wahrnehmung.(1994)
*Bd.2: Aufmerksamkeit. (1996)
*Bd.3: Psychomotorik. (1994)
*Bd.4: Gedächtnis. (1996)
Bd.5:
*Bd.6: Wissen. (1998)
*Bd.7: Lernen (1996)
Bd.8:

Serie III: Sprache

Bd.1: Psychologie der Sprachproduktion.
Bd.2: Psychologie der Sprachrezeption.
Bd.3: Psychologie des Lesens und Schreibens.
Bd.4: Gesprächs- und Textanalyse.
Bd.5: Sprachentwicklung und Spracherwerb.
Bd.6: Psychologie der Sprachanomalien.

Serie IV: Motivation und Emotion

*Bd.1: Theorien und Formen der Motivation.(1982)
*Bd.2: Psychologie der Motive.(1982)
*Bd.3: Psychologie der Emotion.(1990)
*Bd.4: Motivation, Volition und Handlung.(1996)

Serie V: Entwicklung

Bd.1: Allgemeine Entwicklungspsychologie.
Bd.2: Frühkindliche Entwicklung.
Bd.3: Entwicklung im Kindes- und Jugendalter.
Bd.4: Psychologie der Lebensspanne.
Bd.5: Psychogerontologie.
Bd.6: Entwicklung und Sozialisation.
Bd.7: Angewandte Entwicklungspsychologie.

Serie VI: Sozialpsychologie

Bd.1: Soziale Urteilsbildung.
Bd.2: Einstellungen und Vorurteile.
Bd.3: Soziale Interaktionen.
Bd.4: Soziale Beziehungen.
Bd.5: Soziale Kommunikation.
Bd.6: Gruppendynamik.
Bd.7: Kollektives Verhalten.

Serie VII: Kulturvergleichende Psychologie

Bd.1: Theorien und Methoden Kulturvergelichender Psychologie.
Bd.2: Kulturelle Determinanten des Erlebens und Verhaltens.

Serie VIII: Differentielle Psychologie und Persönlichkeitsforschung

*Bd.1: Grundlagen und Methoden der Differentiellen Psychologie. (1996)
*Bd.2: Verhaltens und Leistungsunterschiede (1995).
*Bd.3: Temperaments- und Persönlichkeitsunterschiede. (1996)
Bd.4: Persönlichkeitstheorien.
Bd.5:

Serie IX: Ökologische Psychologie

Bd.1: Allgemeine Ökologische Psychologie.
Bd.2: Spezifische Umwelten und Umweltprobleme.

THEMENBEREICH D
PRAXISGEBIETE

Serie I: Pädagogische Psychologie

*Bd.1: Psychologie der Erziehung und Sozialisation.
*Bd.2: Psychologie des Lernens und der Instruktion.(1996)
*Bd.3: Psychologie des Unterrichts und der Schule
*Bd.4: Psychologie der Erwachsenenbildung.

Serie II: Klinische Psychologie

*Bd.1: Grundlagen der Klinischen Psychologie. (1996)
*Bd.2: Psychische Störungen und ihre Behandlung.
Bd.3: Psychologie in der Klinik.
Bd.4: Klinische Beratung und Psychotherapie.
Bd.5: Kinderpsychotherapie und Erziehungsberatung.

Serie III: Wirtschafts-, Organisations- und Arbeitspsychologie

*Bd.1: Arbeitspsychologie.(1987)
*Bd.2: Ingenieurpsychologie.(1990)
*Bd.3: Organisationspsychologie.(1989)
*Bd.4: Marktpsychologie als Sozialwissenschaft.(1982)
*Bd.5: Methoden und Anwendungen in der Marktpsychologie.(1982)

Serie IV: Psychologie im Rechtswesen

Bd.1: Forensische Begutachtung.
Bd.2: Psychologie des delinquenten Verhaltens.

Serie V: Sportspsychologie

Bd.1: Sportspsychologie I: Sportliche Fähigkeiten und ihre Entwicklung.
Bd.2: Sportspsychologie II: Sportliche Leistung und ihre Bedingungen.

Serie VI: Verkehrspsychologie

Bd.1: Verkehrspsychologie I: Grundlagenforschung.
Bd.2: Verkehrpsychologie II: Begutachtung und intervention.

2. DISPOSITION FOR "DIE PSYCHOLOGIE DES 20. JAHRHUNDERTS 1-16"

Balmer, H. et al. (1976-1981)

I: Die europäische Tradition. Tendenzen, Schulen, Entwicklungslinien.

II: Freud und die Folgen (1). Von der klassischen Psychoanalyse...

III: Freud und die Folgen (2) ... bis zur allgemeinärztlichen Psychotherapie

IV: Pawlow und die Folgen. Von der klassischen Konditionierung bis zur Verhaltenstherapie.

V: Binet und die Folgen. Testverfahren, Differentielle Psychologie, Persönlichkeitsforschung.

VI: Lorenz und die Folgen. Tierpsychologie, Verhaltensforschung, Physiologische Psychologie.

VII: Piaget und die Folgen. Entwicklungspsychologie, Denkpsychologie, Genetische Psychologie.

VIII: Lewin und die Folgen. Gruppedynamik, Sozialpsychologie, Gruppentherapie.

IX: Ergebnisse für die Medizin (1). Psychosomatik.

X: Ergebnisse für die Medizin (2). Psychiatrie.

XI: Konsequenzen für die Pädagogik (1). Das Kind im Elternhaus.

XII: Konsequenzen für die Pädagogik (2). Das Kind in der Schule.

XIII: Anwendungen im Berufsleben. Arbeits-, Wirtschafts- und Verkehrpsychologie.

XIV: Auswirkungen auf die Kriminologie. Deliquenz und Gesellschaft.

XV: Transcendenz, Imagination und Kreativität. Religion, Parapsychologie, Literatur und Kunst.

XVI: Index

Appendix 6a
PsycINFO

[155 classes. Numbers to the left refer to the number of records in the database in 1998]

32388 SH=21
23925 **SH=2100 (GENERAL PSYCHOLOGY)**
8463 SH=2140 (HISTORY & SYSTEMS)

95250 SH=22
20084 **SH=2200 (PSYCHOMETRICS & STATISTICS & METHODOLOGY**
52945 SH=222
7261 SH=2220 (TESTS & TESTING)
474 SH=2221 (SENSORY & MOTOR TESTING)
3911 SH=2222 (DEVELOPMENTAL SCALES & SCHEDULES)
7880 SH=2223 (PERSONALITY SCALES & INVENTORIES)
14432 SH=2224 (CLINICAL PSYCHOLOGICAL TESTING)
2656 SH=2225 (NEUROPSYCHOLOGICAL ASSESSMENT)
1291 SH=2226 (HEALTH PSYCHOLOGY TESTING)
12630 SH=2227 (EDUCATIONAL MEASUREMENT)
2514 SH=2228 (OCCUPATIONAL & EMPLOYMENT TESTING)
170 SH=2229 (CONSUMER OPINION & ATTITUDE TESTING)
11005 SH=2240 (STATISTICS & MATHEMATICS)
11981 SH=2260 (RESEARCH METHODS & EXPERIMENTAL DESIGN)

162688 SH=23
94218 **SH=2300 (HUMAN EXPERIMENTAL PSYCHOLOGY)**
23370 SH=232
4621 SH=2320 (SENSORY PERCEPTION)
13684 SH=2323 (VISUAL PERCEPTION)
5065 SH=2326 (AUDITORY & SPEECH PERCEPTION)
3076 SH=2330 (MOTOR PROCESSES)
33090 SH=234
18970 SH=2340 (COGNITIVE PROCESSES)
13260 SH=2343 (LEARNING & MEMORY)
861 SH=2346 (ATTENTION)
3634 SH=2360 (MOTIVATION & EMOTION)
3393 SH=2380 (CONSCIOUSNESS STATES)
2133 SH=2390 (PARAPSYCHOLOGY)
50549 SH=24
20315 **SH=2400 (ANIMAL EXPERIMENTAL & COMPARATIVE PSYCHOLOGY)**
11194 SH=2420 (LEARNING & MOTIVATION)
19041 SH=2440 (SOCIAL & INSTINCTIVE BEHAVIOR)

137725 SH=25
51974 **SH=2500 (PHYSIOLOGICAL PSYCHOLOGY & NEUROSCIENCE)**
2697 SH=2510 (GENETICS)
21794 SH=2520 (NEUROPSYCHOLOGY & NEUROLOGY)
9913 SH=2530 (ELECTROPHYSIOLOGY)
6528 SH=2540 (PHYSIOLOGICAL PROCESSES)
8702 SH=2560 (PSYCHOPHYSIOLOGY)
36415 SH=2580 (PSYCHOPHARMACOLOGY)

11586 SH=26
3187 **SH=2600 (PSYCHOLOGY & THE HUMANITIES)**
5664 SH=2610 (LITERATURE & FINE ARTS)
2746 SH=2630 (PHILOSOPHY)

18629 SH=27
8133 **SH=2700 (COMMUNICATION SYSTEMS)**
7849 SH=2720 (LINGUISTICS & LANGUAGE & SPEECH)
2648 SH=2750 (MASS MEDIA COMMUNICATIONS)

120063 SH=28
49082 **SH=2800 (DEVELOPMENTAL PSYCHOLOGY)**
32018 SH=2820 (COGNITIVE & PERCEPTUAL DEVELOPMENT)
33199 SH=2840 (PSYCHOSOCIAL & PERSONALITY DEVELOPMENT)
8439 SH=2860 (GERONTOLOGY)

77916 SH=29
21406 **SH=2900 (SOCIAL PROCESSES & SOCIAL ISSUES)**
2555 SH=2910 (SOCIAL STRUCTURE & ORGANIZATION)
4720 SH=2920 (RELIGION)
8026 SH=2930 (CULTURE & ETHNOLOGY)
20891 SH=295
11190 SH=2950 (MARRIAGE & FAMILY)
2256 SH=2953 (DIVORCE & REMARRIAGE)
7447 SH=2956 (CHILDREARING & CHILD CARE)
4066 SH=2960 (POLITICAL PROCESSES & POLITICAL ISSUES)
5881 SH=2970 (SEX ROLES & WOMEN'S ISSUES)
6275 SH=2980 (SEXUAL BEHAVIOR & SEXUAL ORIENTATION)

4173 SH=2990 (DRUG & ALCOHOL USAGE (LEGAL))

68593 SH=30
43416 **SH=3000 (SOCIAL PSYCHOLOGY)**
14046 SH=3020 (GROUP & INTERPERSONAL PROCESSES)
11133 SH=3040 (SOCIAL PERCEPTION & COGNITION)

61737 SH=31
25658 **SH=3100 (PERSONALITY PSYCHOLOGY)**
28644 SH=3120 (PERSONALITY TRAITS & PROCESSES)
7444 SH=314
2041 SH=3140 (PERSONALITY THEORY)
5403 SH=3143 (PSYCHOANALYTIC THEORY)

286512 SH=32
100621 **SH=3200 (PSYCHOLOGICAL & PHYSICAL DISORDERS)**
55332 SH=321
16889 SH=3210 (PSYCHOLOGICAL DISORDERS)
10913 SH=3211 (AFFECTIVE DISORDERS)
15297 SH=3213 (SCHIZOPHRENIA & PSYCHOTIC STATES)
8451 SH=3215 (NEUROSES & ANXIETY DISORDERS)
3786 SH=3217 (PERSONALITY DISORDERS)
42048 SH=323
22459 SH=3230 (BEHAVIOR DISORDERS & ANTISOCIAL BEHAVIOR)
15224 SH=3233 (SUBSTANCE ABUSE & ADDICTION)
8279 SH=3236 (CRIMINAL BEHAVIOR & JUVENILE DELINQUENCY)
18244 SH=325
5815 SH=3250 (DEVELOPMENTAL DISORDERS & AUTISM)
5340 SH=3253 (LEARNING DISORDERS)
7090 SH=3256 (MENTAL RETARDATION)
5521 SH=3260 (EATING DISORDERS)
3345 SH=3270 (SPEECH & LANGUAGE DISORDERS)
380 SH=3280 (ENVIRONMENTAL TOXINS & HEALTH)
61169 SH=329
21576 SH=3290 (PHYSICAL & SOMATOFORM & PSYCHOGENIC DISORDERS)
4643 SH=3291 (IMMUNOLOGICAL DISORDERS)
2602 SH=3293 (CANCER)
3642 SH=3295 (CARDIOVASCULAR DISORDERS)
22952 SH=3297 (NEUROLOGICAL DISORDERS & BRAIN DAMAGE)
5774 SH=3299 (VISION & HEARING & SENSORY DISORDERS)

265848 SH=33
71965 **SH=3300 (HEALTH & MENTAL HEALTH TREATMENT & PREVENTION)**
63311 SH=331
21376 SH=3310 (PSYCHOTHERAPY & PSYCHO-THERAPEUTIC COUNSELING)
2680 SH=3311 (COGNITIVE THERAPY)
11097 SH=3312 (BEHAVIOR THERAPY & BEHAVIOR MODIFICATION)
13160 SH=3313 (GROUP & FAMILY THERAPY)
2987 SH=3314 (INTERPERSONAL & CLIENT CENTERED & HUMAN
12019 SH=3315 (PSYCHOANALYTIC THERAPY)
24498 SH=3340 (CLINICAL PSYCHOPHARMACOLOGY)
10444 SH=335
5281 SH=3350 (SPECIALIZED INTERVENTIONS)
1929 SH=3351 (CLINICAL HYPNOSIS)
470 SH=3353 (SELF HELP GROUPS)
1088 SH=3355 (LAY & PARAPROFESSIONAL & PASTORAL COUNSELING)
1676 SH=3357 (ART & MUSIC & MOVEMENT THERAPY)
20297 SH=336
3521 SH=3360 (HEALTH PSYCHOLOGY & MEDICINE)
4812 SH=3361 (BEHAVIORAL & PSYCHOLOGICAL TREATMENT OF
5593 SH=3363 (MEDICAL TREATMENT OF PHYSICAL ILLNESS)
6371 SH=3365 (PROMOTION & MAINTENANCE OF HEALTH & WEL
49476 SH=337
17133 SH=3370 (HEALTH & MENTAL HEALTH SERVICES)
1486 SH=3371 (OUTPATIENT SERVICES)
12400 SH=3373 (COMMUNITY & SOCIAL SERVICES)
2342 SH=3375 (HOME CARE & HOSPICE)
3728 SH=3377 (NURSING HOMES & RESIDENTIAL CARE)

12396 SH=3379 (INPATIENT & HOSPITAL SERVICES)
26497 SH=338
7331 SH=3380 (REHABILITATION)
12526 SH=3383 (DRUG & ALCOHOL REHABILITATION)
2303 SH=3384 (OCCUPATIONAL & VOCATIONAL REHABILITATION)
1839 SH=3385 (SPEECH & LANGUAGE THERAPY)
4460 SH=3386 (CRIMINAL REHABILITATION & PENOLOGY)

43906 SH=34
19736 SH=3400 (PROFESSIONAL PSYCHOLOGICAL & HEALTH PER
13229 SH=3410 (PROFESSIONAL EDUCATION & TRAINING)
6275 SH=3430 (PROFESSIONAL PERSONNEL ATTITUDES & CHARACTERISTICS
4409 SH=3450 (PROFESSIONAL ETHICS & STANDARDS & LIABILITY
258 SH=3470 (IMPAIRED PROFESSIONALS)

160363 SH=35
60406 SH=3500 (EDUCATIONAL PSYCHOLOGY)
16100 SH=3510 (EDUCATIONAL ADMINISTRATION & PERSONNEL)
27191 SH=3530 (CURRICULUM & PROGRAMS & TEACHING METHOD
14931 SH=3550 (ACADEMIC LEARNING & ACHIEVEMENT)
16276 SH=3560 (CLASSROOM DYNAMICS & STUDENT ADJUSTMENT
17250 SH=3570 (SPECIAL & REMEDIAL EDUCATION)
2058 SH=3575 (GIFTED & TALENTED)
6171 SH=3580 (EDUCATIONAL/VOCATIONAL COUNSELING & STU

70527 SH=36
32521 SH=3600 (INDUSTRIAL & ORGANIZATIONAL PSYCHOLOGY)
5698 SH=3610 (OCCUPATIONAL INTERESTS & GUIDANCE)
5449 SH=3620 (PERSONNEL MANAGEMENT & SELECTION & TRAINING)
3579 SH=3630 (PERSONNEL EVALUATION & JOB PERFORMANCE)
7088 SH=3640 (MANAGEMENT & MANAGEMENT TRAINING)
7174 SH=3650 (PERSONNEL ATTITUDES & JOB SATISFACTION)
5682 SH=3660 (ORGANIZATIONAL BEHAVIOR)
3342 SH=3670 (WORKING CONDITIONS & INDUSTRIAL SAFETY)

6585 SH=37
812 SH=3700 (SPORT PSYCHOLOGY & LEISURE)
3869 SH=3720 (SPORTS)
1904 SH=3740 (RECREATION & LEISURE)

8868 SH=38
8868 SH=3800 (MILITARY PSYCHOLOGY)

7371 SH=39
1294 SH=3900 (CONSUMER PSYCHOLOGY)
3103 SH=3920 (CONSUMER ATTITUDES & BEHAVIOR)
2974 SH=3940 (MARKETING & ADVERTISING)

13314 SH=40
4826 SH=4000 (ENGINEERING & ENVIRONMENTAL PSYCHOLOGY)
3712 SH=4010 (HUMAN FACTORS ENGINEERING)
373 SH=4030 (LIFESPACE & INSTITUTIONAL DESIGN)
374 SH=4050 (COMMUNITY & ENVIRONMENTAL PLANNING)
2032 SH=4070 (ENVIRONMENTAL ISSUES & ATTITUDES)
2002 SH=4090 (TRANSPORTATION)

5206 SH=41
978 SH=4100 (INTELLIGENT SYSTEMS)
2226 SH=4120 (ARTIFICIAL INTELLIGENCE & EXPERT SYSTEM
215 SH=4140 (ROBOTICS)
1787 SH=4160 (NEURAL NETWORKS)

11550 SH=42
4018 SH=4200 (FORENSIC PSYCHOLOGY & LEGAL ISSUES)
2309 SH=4210 (CIVIL RIGHTS & CIVIL LAW)
3350 SH=4230 (CRIMINAL LAW & ADJUDICATION)
587 SH=4250 (MEDIATION & CONFLICT RESOLUTION)
255 SH=4270 (CRIME PREVENTION)
1031 SH=4290 (POLICE & LEGAL PERSONNEL)

Appendix 6b

PSYCHOLOGICAL ABSTRACTS (1986).
[81 Classes]

GENERAL PSYCHOLOGY
- Parapsychology
- History & Philosophies & Theories
- Research Methods & Apparatus & Computer Applications

PSYCHOMETRICS
- Test Construction & Validation
- Statistics & Mathematics

EXPERIMENTAL PSYCHOLOGY (HUMAN).
- Perception & Motor Processes
  - Visual Perception
  - Auditory & Speech Perception
- Cognitive Processes
  - Learning & Memory
- Motivation and Emotion
- Attention & Consciousness States

EXPERIMENTAL PSYCHOLOGY (ANIMAL).
- Learning & Motivation
- Social & Instinctive Behavior

PHYSIOLOGICAL PSYCHOLOGY.
- Neurology & Electrophysiology
- Physiological Processes
- Psychophysiology

PHYSIOLOGICAL INTERVENTION
- Electrical Stimulation
- Lessions
- Drug Stimulation & Psychopharmacology

COMMUNICATION SYSTEMS
- Language and Speech
- Literature and Art

DEVELOPMENTAL PSYCHOLOGY
- Cognitive & Perceptual Development
- Psychosocial & Personality Development

SOCIAL PROCESSES AND SOCIAL ISSUES.
- Social Structure & Social Roles.
- Culture & Ethnology & Religion.
- Marriage & Family
- Political & Legal Processes
- Psychosexual Behavior & Sex Roles.
- Drug & Alcohol Usage.

EXPERIMENTAL SOCIAL PSYCHOLOGY.
- Group & Interpersonal Processes.
  - Social Perception & Motivation.

PERSONALITY.

PHYSICAL AND PSYCHOLOGICAL DISORDERS.
- Mental Disorders
- Behavior Disorders & Antisocial Behavior
- Learning Disorders & Mental Retardation
- Speech and Language Disorders
- Physical & Psychosomatic Disorders.

TREATMENT AND PREVENTION.
- Psychotherapy & Psychotherapeutic counseling.
  - Group & Family Therapy.
    - Encounter Group & Sensivity & Human Relations Training.
- Behavior Therapy & Behavior Modification.
- Drug Therapy.
- Hypnotherapy.
- Speech Therapy.
- Health Care Services.
  - Community Services & Mental Health Programs
  - Counseling & Social Casework.
  - Hospital Programs & Institutionalization.
- Rehabilitation & Penology.
  - Drug & Alcohol Rehabilitation.

PROFESSIONAL PERSONNEL AND PROFESSIONAL ISSUES.

EDUCATIONAL PSYCHOLOGY.
- Educational Administration & Personnel & Training.
- Curriculum & Programs & Teaching Methods.
- Academic Learning & Achievement.
- Classroom Dynamics & Student Adjustment & Attitudes.
- Special & Remedial Education.
- Counseling & Measurement.

APPLIED PSYCHOLOGY.
- Occupational Attitudes & Interests & Guidance.
- Personnel Selection & Training.
- Personnel Evaluation & Performance.
- Management & Management Training.
- Organizational Behavior & Job Satisfaction.
- Human Factors Engineering.
- Environmental Psychology & Environmental Issues.
- Marketing & Advertising.

Appendix 7

Classification of Psychology
(52 classes)
(Hjørland, 1980)

A: Psychology in general
A1: History, biography and geography of psychology
A2: Methods, statistics etc.
A3: Philosophy and Theory of science
A4: Psychological approaches
A4.1: Behaviorism
A4.2: Psychoanalysis
A4.3: Humanistic psychology
A4.4: Dialectical materialism

B: Neuropsychology, genetics, and psychochemistry

C: Comparative psychology

D: Psychological functions in general
D1: Consciousness, sleeping, dreaming etc.
D2: Perception and psychophysics
D3: Learning and memory
D4: Thinking
D5: Psychology of language
D6: Motivation, emotion, acts
D6.1: Psychology of sexuality

E: Psychology of personality; Differential psychology. Psychological tests
E1: Psychology of women

F: *Developmental psychology*
F1: Children (including pregnancy, birth, child-parent relations etc.)
F2: Psychology of youth
F3: Adult development
F4: Psychogerontology (including the psychology of death)

G: Social Psychology
G1: Family psychology
G2: Cultural psychology

H: Psychology of work and organizational psychology
H1: Organizational psychology
H2: Psychology of unemployment
H3: Ergonomics

I: Educational Psychology
I1: Special education

J: Clinical psychology/Psychiatry (with community psychology)
J1: Psychopathology and psychodiagnostics (with concrete syndroms, including drug abuse)
J2: Therapy
J3: Child and adolescent clinical psychology/psychiatry

K: Medical psychology, somatopsychology, etc.

L: Other areas of applied psychology and special psychologies
L1: Criminal psychology
L2: Economic Psychology, advertising
L3: Sports- and recreational psychology
L4: Aestetical psychology and arts (with literature, music & picture)
L5: Political and historical psychology
L6: Traffic psychology
L7: Environmental psychology (town and home environment, noise etc)
L8: Psychology of religion
L9: Military psychology

M: Parapsychology (with meditation and yoga)

N: Other Subjects

Notes

1. This paper is not about the psychology of classification, which is a major subject in cognitive psychology.
2. As a contribution to LIS this article could be seen as an example of what I have earlier named "domain analysis" (Hjørland & Albrechtsen, 1995). This paper concentrates on just one aspect of such an analysis: the classification of a subject area. There have been other methodological contributors to classification of knowledge fields, mainly in the facet analytical tradition (e.g., Mills, 1957; Vickery, 1960).
3. Jørgensen (1963) is another exception from this general tendency. In this work Jørgensen suggested a very scholarly classification of psychological phenomena based on a combination of behavioral, phenomenological, and physiological criteria. Jørgensen was both a leading person in the movement of logical positivism and also a Marxist. In my opinion these two influences can both be traced in Jørgensen's original definition and classification of psychology, and they are in conflict (in a way postulated by me, but not clear to himself). As logical positivist/empiricist Jørgensen could only accept things that can be observed. Therefore he defined the human psyche by observational criteria. As a Marxist he was influenced by scientific realism and looked after mechanisms behind what is observed. It is, however, outside the scope of this article to discuss his proposal for the classification of psychology. Jørgensen's interest in classification in a period of time where the general interest in classification was low, can partly be explained by the fact that he was a philosopher, and not a psychologist. There was (and still is) a certain division of labor between psychology as an empirical science and (mental) philosophy as a theoretical science.
4. Whitley (1984) is an example of an important sociological contribution.
5. It is outside the scope of this article to discuss the concept of classification itself. However, two recent contributions should be mentioned:
   Adams & Adams (1991) differentiate between classification and taxonomy. They see a *taxonomy* as a special kind of classification with specific hierarchical characteristics, a classification in which smaller and more specific classes or *taxa* (singular: taxon) are grouped to bigger and more general ditto. A *typology* they conceive as a form of classification which is specially designed with the aim of sorting the elements in mutually exclusive categories called *types*.
   Jacob (1991, 1994) finds that *categorization* is the fundamental cognitive tool that facilitates the organization, storage and retrieval of information. Traditional classification is an arbitrary and artificial tool that is used to structure a specific knowledge domain while ensuring consistency and stability of meaning. Because a classificatory structure serves to identify relationships between entities and to set the boundaries for a specific area of inquiry, it establishes a worldview that limits the recognition of similarities. To encourage dialogue across disciplinary boundaries, the specificity of meaning inherent in the classificatory structure must be replaced by more general meanings that function across disciplines.
6. I consider classifications made without any explicit methodology, just based on the view or horizon of the persons who are doing the classification to be "subjective" because they do not apply the public knowledge. Therefore they tend to reflect specific persons view (or perhaps a widespread ideology) rather than the public or scientific view revealed by scholarly/scientific studies.
   I also regard such studies as "pragmatic" in one sense of this word. It is, however, very important not to confuse this meaning of "pragmatism" with the view developed by pragmatic philosophers, such as Charles Sanders Peirce or John Dewey around the beginning of the 20th century.
7. The most influential classification of mental disorders *is Diagnostic and Statistical Manual of Mental Disorders* (DSM) published by American Psychiatric Association. Its 4th edition (DSM-IV) is from 1994. This system is widely recognized and debated in the literature (214 book reviews in Social Sciences Citation Index and 10.692 entries in the PsycINFO database.) This system is mainly based on an empirical epistemology and has been discussed by people informed by other epistemologies.
8. However, it is done in different ways, and epistemological trends in the sciences do affect the use of classificatory methods, and even the attitude towards the relevance of classifying at all. According to Kuiken, Wild & Schopflocher [11] positivism has had negative influence on classification in the sciences.
9. Classification theory may find itself in a situation very similar to that of lexicography. Eco (1984, p. 68) shows how the idea of a dictionary runs into theoretical difficulties: "The tree of genera and species, the tree of substances, blows up in a dust of differentiae, in a turmoil of infinite accidents, in a nonhierarchial network of *qualia*. The dictionary is dissolved into a potentially unordered and unrestricted galaxy of pieces of world knowledge. The dictionary thus becomes an encyclopedia, because it was in fact *a disguised encyclopedia*." (Emphasis in original).
   On p. 84 he writes: "Such a notion of encyclopedia does not deny the existence of structured knowledge; it only suggests that such a knowledge cannot be recognized and organized as a global system; it provides only "local" cultural organizations; every attempt to recognize these local organizations as unique and "global" – ignoring their partiality – produces an *ideological* bias.
   The Porphyrian tree tried to tame the labyrinth. It did not succeed because it could not, but many contemporary theories of language are still trying to revive this impossible dream". (Emphasis in original).
   And, one could add that almost all contemporary theories on information retrieval and knowledge organization – in building on empirism or rationalism – are also trying to revive the same impossible dream.
10. About the etymology of the term "psychology" see Lapointe, 1973 and Vandekemp, 1980 & 1983.
11. Many different terms can be used as a label to describe the same subject area. Examples are "psychology", "the study of the soul", "the science of consciousness", "psychoanalysis", "the science of behavior", "cognitive science", "the

science of the mental", "the study of subjectivity", "personology", or "microsociology". If they are used about the same subject area, they are semantically synonymous. However, the definition of psychology is really difficult because it is not given that they refer to the same knowledge field. They represent more or less different or identical views on man, which imply more or less different or identical subject domains. The question about the synonymity of those terms is therefore not objective or a priory, but a theoretical question depending on the development of the theories about psychology.

Also the term "psychology" has not one meaning but many meanings. The use of the term is theory laden. For example, some users of the term psychology are more related to the study of physiological processes, while others are more related to the study of personality processes from a more sociological point of view. The philosopher of science Dudley Shapere (1984) writes about "domains": "Although in more primitive stages of science (or, perhaps better, of what will become a science), obvious sensory similarities or general presuppositions usually determine whether certain items of experience will be considered as forming a body or domain, this less and less true as science progresses (or, as one might say, as it becomes more unambiguously scientific). As part of the growing sophistication of science, such associations of items are subjected to criticism, and are often revised on the basis of considerations, which are far from obvious and naïve. Differences, which seemed to distinguish items from one another are concluded to be superficial; similarities which were previously unrecognized, or, if recognized, considered superficial, become fundamental. Conversely, similarities, which formerly served as bases for association of items come to be considered superficial, and the items formerly associated are no longer, and form independent groupings or come to be associated with other groups. The items themselves often, in the process, come to be redescribed, often, for scientific purposes, in very unfamiliar ways". (Shapere, 1984, p. 323).

This is important because it implies that the classification of knowledge domains cannot be done independently of the claims or views of the knowledge in the domain *".. as science proceeds, the connection between knowledge-claims, domain groupings, and descriptions (and often naming) tend to become tighter and tighter"* (Shapere, 1984, p. 324).

According to Shapere, domains are bodies of subject-matter that have become delineated by the way in which the history of scientific methodology, theory and discovery has developed over many centuries, and even at a mature stage they are in a process of constant refinement and occasional wholesale reordering and unification. There seems to be a long term tendency to develop more comprehensive theories which unite domains of subject matter.

The definition of psychology therefore cannot be made from etymological studies alone, but requires a theory about the domain which the term is meant to cover. Such a theory should be able to explain what is to be included and what is to be excluded from psychology.

A theory about the classification of psychology must develop a metatheory of what is by different views included and excluded from psychology. In order to argue what should be excluded from psychology the theory must be able to explain where these phenomena belong in the universe of knowledge. Its theory about the domain of psychology must not only imply a classification of what is regarded as psychological phenomena according to the theory itself, but it should also be able to classify phenomena which other theories regard as psychological phenomena.

In my view, the ontological and epistemological theories are the basic theories, which can be used as psychological metatheories to produce the basic outline of a classification of psychological knowledge. This view is, however, itself a theory which is opposed to the anti-metaphysicalism of empiricism and positivism.

12. Aristotle was of the opinion that the book "De anima" treated the most important of all subjects.

13. The psychological systematization presupposes some philosophical clarifications of the nature of psychological phenomena and the psycho-physical problem. Do psychological phenomena only exist in man (called "anthropopsychism") as, for example, Descartes thought, or – to take the opposite extreme theory – is the whole world, including non-living objects, endowed with spirit (called "panpsychism") or do psychological phenomena only exist in living beings (called "biopsychism")? Or do they only exist in certain higher animals?

The Psycho-Physical Problem (The Mind-Body Problem)		
MONISTIC THEORIES	DUALISTIC THEORIES	PLURALISTIC THEORIES
Materialistic theories (Karl Marx, John B. Watson*)	The Theory of Interaction (Descartes)	Karl Popper & J.Eccles "Three Worlds"
Spiritualistic or idealistic theories (Berkeley)	The Theory of Parallelism (Leibnitz)	
The theory of Identity (Spinoza)	The Epiphenomenological Theory (Pavlov)	Karl Pribram

* (According to Tolman (1992) John B. Watson and the behaviorism he founded were not materialistic, but phenomenologistic and hence philosophically idealistic. This view is connected to an important distinction between empiricism/positivism on the one side and scientific realism on the other. Empiricism/positivism tries to base all knowledge on sense impressions and to avoid any "metaphysical" assumptions. Sense impressions are, however, purely subjective, and without language to ensure the objectivity of observations empiricism cannot avoid the idealistic trap).

Immanuel Kant put forward a classical categorization of psychological phenomena in his book "Kritik der Urtheilskraft" (1790), in which he divided psychical phenomena into "Erkenntnisvermögen" (*Cognition*), "Gefühl der Lust und Unlust" (*Emotion*) and "Begehrungsvermögen" (*Motivation*). Different psychological theories have attempted to reduce these phenomena to one. Different psychological approaches tend to overestimate the importance of some processes at the expense of others.

For example, psychoanalysis tends to overestimate motivation, while cognitivism tends to overestimate the role of cognitive processes.

It is also important to notice that in the "classical psychology" (e.g., by Wundt) cognition, emotion and motivation were regarded as a microcosmos, a world closed on itself, apart from bodily phenomena (based on the dualism of Decartes). It was thought that self-observation (introspection) could be used to uncover the basic elements of consciousness, the special psychical "matter".

Leontjev writes: "The classical rationalistic psychology was as an attempt to uncover our psychical world, the world of our ideas, our emotions and our thought, and here find the laws which express its nature. They believed that they only had to observe and come to terms with the fluctuating and unclear subjective psychical experiences in a sufficiently rational and careful way in order to find the laws and causes which govern the "small world" of our consciousness. This could be done in the same way as the observation of the stars had let humankind to the discoveries of the laws that govern the physical universe, the "big world".

This psychological idea was never realized, and in fact can never be realized. The world of our consciousness has no resemblance with the world of the planets. You cannot consider consciousness a closed existence in itself and search for independent connections in it. They do not exist. If you talk about "spiritual movements" or "spiritual forces" then you are just using simple metaphors. The expressions of consciousness are always connected to one thing or another and reflect something. Therefore there does neither exist a physics of conscious expressions nor a mathematics of ideas or a geometrical or pure form of the spirit. The expressions of our consciousness are always determinated by the external reality of objects, which is reflected in it". (Leontjev, 1977, p. 86; my translation).

It is not until the development of the functionalistic and behaviouristic approach that psychology relates consciousness to behavior and acts to the body and to the adaptation of the individual to his/her environment (cf., Jarosjevski, 1980). This is one reason why categories like behavior, acting and activity are missing in the classical tripartition (cognition/emotion/motivation).

14. To say that psychology *became* split is slightly wrong, because a split between, for example, biological and sociological conceptions of psychological phenomena is already visible in the works of Aristotle.

15. The reason that is seldom explicated very well that different approaches to psychology imply different views of subject matter and classification is that each approach tends to consider itself the only real scientific approach, and that psychology as a new empirical science disconnected from philosophy tended to make all such questions merely empirical questions.

16. The formal establishment of psychology as a science was done in universities. First in Leipzig, and very soon in all major universities in the rest of the world. When a discipline is established at a university it becomes both an area of research and of teaching. The kind of psychology, which is taught at universities is called "academic psychology". Psychoanalysis (founded by Sigmund Freud around 1900) was not part of academic psychology for a very long time, and is still mainly a non-academic field of knowledge with strong connections to applied psychotherapy.

    One indication of the historical impact of a field of knowledge such as psychoanalysis on academia is the number of dissertations written with that approach. In Denmark a dissertation by Lise Østergaard from 1959 is the first one that documents the acceptance of the psychoanalytic viewpoint in academic psychology.

    Another indication of the relationship between academic and non-academic knowledge is the system of journals. Psychoanalytic contributions can, for example, be found in academic psychological journals, as well as in academic medical journals (as well as other disciplines such as philosophy and literature). The core set of psychoanalytic journals are, however, not affiliated with any academic discipline, but are connected to psychoanalytic societies in different countries. It is a characteristic of the relation between academic mainstream and psychoanalysis that the American Psychological Association did not establish a psychoanalytically oriented journal until 1984 (Psychoanalytic Psychology, sponsor: American Psychological Association, Division of Psychoanalysis). By the way it is only sponsored, not like many other journals published, by the American Psychological Association (which represents members educated in psychology at the universities).

17. Wundt himself – physician and physiologist by education – also regarded experimental psychology as a very limited area of psychology. He wrote a major work "Völkerpsychologie" (vol. 1-10) based on more humanistic methods, and he did not want that psychology should become "an independent discipline", but he wanted it as part of philosophy with close connections to other humanistic disciplines. He had, however, started a process which he himself could not control. Psychology became an independent field of study partly as a result of the competition for jobs, and partly because of the development of anti-psychologistic tendecies in philosophy itself (see Danziger, 1990, p. 41).

18. [Danziger underlines the discipline's tendency to annex new areas such as educational psychology, which existed before the formal establishing of psychology as a science. One may ask: Where did these areas come from? How did they arise as parts of human discourses? How did man become an object of research? In asking such questions, the research done by Michel Foucault is extremely relevant (e.g., Foucault, 1967, 1970, 1972, 1973, 1976, 1977, 1978)]

19. Danziger has here a note 1: "More recently, the category of "cognition" has played a similar role. The idea of abstract laws uniting many domains of psychological functioning, irrespective of content, reappeared in the form of the category of "cognition" just when "learning" could no longer play this role effectively. But this development falls outside the time period of this book" (Danziger, 1997, p. 108).

20. In an earlier book Danziger reveals a slightly different view on the possibility of establishing realistic psychological categories:

"One thing that has emerged from the historical analysis of changes in investigative practices is the importance of the social alliances formed by the discipline as a whole and by subgroups within the discipline. These alliances tended to favor and to maintain certain practices over others. An escape from methodological solipsism is likely to depend on the variety of alliances that members of the discipline manage to forge.

Working relationships and alliances are formed not only with other professional groups. We have seen that the social context in which psychological knowledge products are ultimately applied have an effect on the kind of knowledge product for which there is a demand and hence on the practices that must be used to produce it. In that connection it is difficult to ignore the dominant role administrative useful knowledge has played in the past. As long as that state of affairs persisted, the kind of reality to which much of psychological investigation provided access was an administratively created reality. Even when it was not directly tied to actual administrative reality, this kind of research created its own replica of such a reality, as in early American personality research.

The administrative context of application cast its shadow over significant parts of the context of investigation, which did not help to broaden the latter's access to the real world outside such contexts. The prospects of that happening would seem to depend on the extension of disciplinary alliances to groups of people who are more interested in psychological knowledge as a possible factor in their own emancipation than as a factor in their management and control of others.

The worldly success of modern psychology was built on a narrow social basis. That entailed a very considerable narrowing of epistemic access to the variety of psychological realities. Critical analysis can give us some knowledge of that which has been excluded – in other words, knowledge that has emerged in different social contexts. The receptivity of discipline to such knowledge, however, would seem to be tied to changes in its social and cultural commitments." (Danziger, 1990, 197)

21. If this should not be totally clear from the citations from Danziger (1997) I strongly recommend that everybody should read the whole book.

22. The implication of what is said here is that I disagree with the organizational principle put forward by the German ENZYKLOPÄDIE DER PSYCHOLOGIE 1-88 (see Appendix 2).

23. It may not seem an easy approach. But who has said that doing scientific and scholarly works and making real contributions to knowledge should be an easy task? Researchers are expected to educate themselves so that they are qualified to attack the problems with the kind of methods required by the problems (and not vice versa)!

24. One research object in psychology is, for example, emotions such as anxiety. The basic approaches in psychology towards anxiety are very different. *Behaviorism* approaches anxiety as a kind of conditioning or as a learned behavioral pattern. *Ethology* approaches anxiety as a kind of instinctive behavior developed phylogenetically. *Psychopharmachology and biologically oriented psychiatry* look at anxiety as a defect in the brain that might be cured by medical treatment. *Psychoanalysis* sees anxiety as determined by personality structure and forgotten childhood experiences. *Cognitivism* sees anxiety as a kind of reasoning with negative consequences for the self. *Existentialism* may look at anxiety from a religious perspective or from the perspective of the meaning of human life. *Social constructivism* looks at anxiety as a repertoire of different culturally shaped ways at behaving. *Marxism* may look at anxiety as the individual's response to a real threat in a capitalist society, and so on.

In my view all these approaches have something important to say about anxiety. Their generalizations are, however, problematic. The important thing to realize is that anxiety is a biological, a cultural *and* an individual phenomenon. It is important not to reduce anxiety to only one aspect.

25. This is further affirmed by an analysis of psychoanalysis put forward by Schultz, 1988, who sees the solid core of psychoanalysis as the realistic and cultural study of human *symbolic* cognition. His main criticism of Sigmund Freud is that Freud "built his ship on the wrong yard". Schultz bases his psychology much on Freud and Leontiev (e.g., Leontiev, 1977) and finds that Leontiev and his tradition has too little to say about a very central issue in psychology: the symbolic activities of human beings (in which psychoanalysis and also phenomenology are strong). However, Freud's psychology should be based on a realistic epistemology. Psychoanalysis is then mainly the realistic study of human symbolic cognition. Schultz also proposes a classification of psychology as shown below.

<table>
<tr><td colspan="4">A Realist View on the Classification of Psychology
(Modified after Schultz, 1988, p. 270)</td></tr>
<tr><td colspan="4">Science of Life (Study of life activity)</td></tr>
<tr><td>Biology
(The science of simple life activity)</td><td colspan="3">Psychology
(Science of the cognitive activity)</td></tr>
<tr><td rowspan="2">Ethology
(Science of subject-activity)</td><td colspan="3">Psychology of Personality
(The Science of person activity)</td></tr>
<tr><td>Dynamic psychology
(The science of symbolic cognition)</td><td colspan="2">Psychology of thinking or reflection
(The Science of categorical cognition)</td></tr>
</table>

26. Kuhn's view did not, however, influence the basic thinking about users and cognition in cognitive psychology (or in information science) for a long time. The influence of historicism in this discipline was in particular introduced by the criticism which Winograd & Flores (1986) posed to traditional "rationalism" (in the form of "artificial intelligence" and cognitivism). This implies a new view of users as social and cultural beings and of a more sociological-epistemological view on information seeking.

27. To identify a pragmatic understanding of psychology with the understanding of psychology as an applied sci-

ence would be a rather vulgar interpretation of pragmatism, but it is, however, more true for some pragmatist researchers than for others.

28. An important issue in all classifications is what are the "elements" or units to be classified. Very few psychological theories use this word or have an explicit definition of this concept. Fechner did, and Mammen (1993, 1998) has made a new proposal which I find extremely important. The *meaning* of a thing, say "an axe", is not just a result of some sensory properties, but of a standardized human practice and a tradition for producing this tool. The *sense* of a thing, for example "an axe" is the result of my personal relation to a concrete axe or to axes in general. Humans are different from animals in that they not only sense things because of their universal attributes. Man has a special ability to perceive the numerical identity of objects and thus to follow the history of objects (which may be lost in some cases of schizophrenia). The unit of the specific human psychology is thus a subject (1) in relation to an object (e.g. a tree), mediated by a tool (e.g., an axe) this relatedness is influenced by other human subjects (at least one, subject 2). According to Mammen, these are the necessary, basic elements in human psychology. This view changes fundamentally the traditional classification of psychology: "To conclude: One advantage of using the same basic "units of analysis" in all these different cases is that some of the traditional distinctions between cognitive and "motivational" psychology, or psychology of personality, vanish. ..." Mammen (1993, p. 41).

29. Among important classification systems not discussed in this paper is *Medical Subject Headings. Tree structures* published currently by National Library of Medicine in Washington.

30. This overall structure might be an exception from the rule that such systems are not built on principles developed in or communicated by LIS.

31. How is this scheme of classification actually applied? Are each of the records in the PsycINFO database given one and only one classification code/subject heading? A simple analysis in the database shows that the number of records with a subject heading/classification code (SH=) is 1.528.542 or equal to the total number of records in the database. Also the number of records printed in 1996 equals the number of records with a subject heading from this year, showing that each record has at least one subject heading.

    S1 56437 PY=1996
    S2 1528542 SH=?
    S3 56437 S1 AND S2

    However, some records must have more than one classification code because the truncated set of classification codes beginning with the numbers 2, 3 and 4 do have an overlap (92.393 records both have a classification code beginning with the number 2 and the number 3). At least 102.173 out of 1.528.542 records or 6.7% have more than one classification code (this small investigation cannot reveal duplicates beginning with the same number).

    The fact that each record can have more than one classification code ascribed to it means that the function of the classification system is not sharply defined in relation to the descriptor system (the thesaurus) where the norm is to apply a number of different descriptors to each record.

Set	Items	Description
S1	0	SH=0?
S2	0	SH=1?
S3	668637	SH=2?
S4	932331	SH=3?
S5	29747	SH=4?
S6	0	SH=5?
S7	0	SH=6?
S8	0	SH=7?
S9	0	SH=8?
S10	0	SH=9?
S11	1528542	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10
S12	92393	S3 AND S4
S13	3430	S3 AND S5
S14	6350	S4 AND S5
S15	102173	S12 OR S13 OR S14
S16	0	S12 AND S13 AND S14

32. This retroconversion to provide each record with a new field displaying age groups was done mechanically, in such a way that all records which did not have descriptors for children were defined as concerning adults. This is not an elegant solution, because many writings (such as this paper) are neither about children nor about adults.

33. The coverage of PsycINFO is not only psychology, but also related disciplines, for example, psychiatry or educational research. This represents a clear dilemma. We have many databases covering these fields and from the user's perspective it is better that each database has a deeper coverage than having great overlap between databases *at the same time* as having great gaps in the coverage of the core disciplinary literature. (This may not be the case from a commercial perspective.) Interdisciplinarity in coverage also makes it harder to make an adequate subject representation (e.g., classification) and to provide the users with a clear picture of the size, extent, structure and content of the current psychological knowledge.

34. I disregard the fact that 2100 is only used for metadisciplines. This is a thing that has happened in the history of the system, and which, in my opinion, is a fault.

35. Poulsen (1984, p. 169-) writes: "If scientific psychology is to be a general psychology in the meaning that it is only concerned with the aspects of human psychology which are common to all people and characteristic for the human species, this will have unacceptable consequences. Psychology will be a science which denies caring about psychological functions in the specific forms in which they exist in specific societies and in specific individuals. ...scientific psychology becomes irrelevant and relevant psychology non-scientific". (My translation).

36. What does the term "general" mean. This is not a trivial question, but a complicated philosophical one. I once made a major analysis of the meaning of this term when it was used as adjective in relation to the name of a science (e.g. general psychology, general physiology, or general sociology). Part of this is published in Hjørland, 1982, but some parts remain unpublished.

My major result was that the meaning of the terms varies with the philosophical view in the sciences. Within the dominant empiristic view a general discipline is seen reductionistic, as the part of the discipline which was considered foundational. Thus general psychology meant physiological psychology, general physiology meant chemical physiology, and general sociology meant psychosociology. Within a non-reductionistic view, however, a general discipline means the part of the discipline in which its general principles are formulated. At the University of Copenhagen (and elsewhere?) the term "General psychology" has been considered a subdiscipline of psychology. As such it is not identical with experimental psychology or physiologically oriented psychology but is supposed to formulate the basic principles of psychology spanning both biological and sociological views. Leontievs' (1977) general psychology is an influential example of this last meaning.

References and Selected Bibliography:

Adams, J. C. (1999). Principles of classification (normative, geographic, ethnographic, linguistic, philosophica, phenomenological and other). In: Religions, the study and classification of. *Britannica® CD 99 Multimedia Edition.* Chicago, IL: Encyclopaedia Britannica, Inc., © 1994-1999.

Adams, W. Y. & Adams, E. W. (1991). *Archaeological typology and practical reality. A dialectical approach to artifact classification and sorting.* Cambridge: Cambridge University Press.

Allport, G. W. (1937). *Personality: A Psychological Interpretation.* New York: Holt, Rinehart & Winston.

Andersen, N. O., Arnberg, J., Thoring Hansen, J., & Marcussen, L. (1983). *Erkendelsesteori og videns-klassifikation.* København: Danmarks Biblioteksskole, 1983. (Danmarks Biblioteksskoles A4-serie nr. 23)

Anderson, J. R. (1983). *The Architecture of Cognition.* Cambridge, MA: Harvard University Press.

Andkjær Olsen, O. & Køppe, S. (1996): *Psykoanalysen efter Freud. Bind 1-2.* København: Gyldendal.

Asendorpf, J. (1991). *Die differentielle Sichtweise in der Psychologie.* Göttingen: Verlag für Psychologie.

Baldwin, J. M. (1901). A Scheme of Classification for Psychology. *Princton Contributions to Psychology, 3*(1), 16-19.

Balmer, H. et al. (Ed.) (1976-1981). *Die Psychologie des 20.Jahrhunderts.* Zürich: Kindler.

Battan, L. J. (1999). Approaches to climatic classification. Genetic classifications. Empiric classifications. In: Climate and weather. *Britannica® CD 99 Multimedia Edition.* Chicago, IL: Encyclopaedia Britannica, Inc., © 1994-1999.

Braun, C. M. J. & Baribeau, J. M. C. (1984): The Classification of Psychology Among the Sciences from Francis Bacon to Boniface Kedrov. *Journal of Mind and Behavior, 5*(3), 245-259.

Brocke, B. (1980). Wissenschaftstheoretische Grundlagenprobleme der Angewandten Psychologie. Das Abgrenzungs-, Konstituenten- und Fundierbarkeitsproblem. *Zeitschrift für Sozialpsychologie, 11,* 207-224.

Bry, I. & Afflerbach, L. (1968): In search of an organizing principle for the behavioral science literature. *Community Mental Health Journal, 4*(1) , 75-84.

Burne, A. (1995). Behaviourism. In S. Guttenplan (Ed.), *A companion to the philosophy of mind* (pp. 132-140). Oxford, England: Blackwell Publishers. (Blackwell Companions to Philosophy).

Chafetz, M.D. (1986). Taxonomy in Psychology: Looking for Subatomic Units. *The Journal of Psychology, 120*(2), 121-135.

Danziger, K. (1990). *Constructing the subject. Historical origins of psychological research.* Cambridge: Cambridge University Press.

Danziger, K. (1997). *Naming the Mind. How Psychology Found its Language.* London: SAGE.

Dewey, J. (1948). *Reconstruction in philosophy.* (Enlarged ed.). New York: Beacon. (Original work published 1920)

Diagnostic and Statistical Manual of Mental Disorders: DSM-IV. 4th ed. (1994). Washington, D. C.: American Psychiatric Association.

Dreger, R. M. (1968). Aristotle, Linnaeus, and Lewin, or the Place of Classification in the Evaluative-Therapeutic Process. *Journal of General Psychology, 78*(1), 41-59.

Dubois, D. (1994). Identity and Autonomy of Psychology in Cognitive Sciences: Some Remarks from Language Processing and Knowledge Representation. *World Futures, 42,* 71-78.

Eco, U. (1984). *Semiotics and the Philosophy of Language.* London: The MacMillan Press Ltd.

Fiedler, F. (1990). Klassifikation der Wissenschaften. In Sandkühler, H. J. (Ed.). *Europäische Enzyklopädie zu Philosophie und Wissenschaften Band 1-4* (Band 2 pp. 812-515). Hamburg: Felix Meiner Verlag.

Fiske, D. W. (1991). Macropsychology and micropsychology: natural categories and natutral kinds. (In: R.E. Snow and D. E. Wiley (eds.), *Improving inquiry in Social Science.* Hillsdale, NJ: Erlbaum. pp. 61-74).

Foucault, M. (1967). *Madness and civilization: a history of insanity in the Age of Reason.* London: Tavistock Publications. (Translated from: Folie et deraison; histoire de la folie a l'age classique. Paris: Plon, 1961).

Foucault, M. (1970). *The order of things; an archaeology of the human sciences.* London: Tavistock Publications. (Translated from "Les mots et les choses; une archéologie des sciences humaines". Paris, Gallimard, 1966)

Foucault, M. (1972). *The archaeology of knowledge.* New York, Pantheon Books. (Translated from the French by A. M. Sheridan Smith from: "L'archeologie du savoir". Paris: Gallimard, 1969).

Foucault, M. (1973). *The birth of the clinic; an archaeology of medical perception.* New York: Pantheon. (Translated from the French by A. M. Sheridan Smith from "Naissance de la clinique; une archeologie du regard medical. Paris, Presses universitaires de France, 1963).

Foucault, M. (1976). *Mental illness and psychology.* New York: Harper & Row, (Translated by Alan Sheridan from "Maladie mentale et psychologie" Paris: Presses universitaires de France, 3.ed. 1966)

Foucault, M. (1977). *Discipline and Punish; the birth of the prison.* New York: Random House. (Translation of: Surveiller et punir; naissance de la prison. [Paris] : Gallimard, 1975).

Foucault, M. (1978): *The history of sexuality vol. 1-3.* New York: Pantheon Books. (Vol. 1. An introduction. Vol. 2. The use of pleasure. Vol. 3. The care of the self.) (Translation from: "Histoire de la sexualité". Paris: Gallimard, 1976. 1. La volonté de savoir. 2. L'usage des plaisirs. 3. Le souci de soi.)

Garfield, E. (1976). Social-Sciences Citation Index Clusters. *Current Contents,* N27, 5-11

Garfield, E. (1979). *Citation Indexing: Its Theory and Application in Science, Technology, and Humanities.* New York: John Wiley.

Garfield, E. (1992).: Psychology Research, 1986-1990 – A Citationist Perspective on the Highest Impact Papers, Institutions, and Authors. *Current Contents, V41,* (OCT 12), 5-13

Goody, J. (1987). *The Interface Between the Written and the Oral.* Cambridge: Cambridge University Press.

Graumann, C.-F. et al. (Ed.).(1981-). *Enzyclopädie der Psychologie Band 1-88.* Göttingen: Verlag für Psychologie.

Gregg, A. et al. (1970). The place of psychology in an ideal university: The report of the University Commission to advise on the future of psychology at Harvard. *American Psychologist, 25*(5), 391-420. (Reproduces the 1947 report of the Harvard Commission in the context of a contemporary discussion of the place of psychology in the university).

Harré, R. (1991). Psychology. IN: Burkhardt, H, & Smith, B. (Eds.) *Handbook of Metaphysics and Ontology. Vol 1-2, A-Z* (Vol. II pp. 736-742). Munich, Vienna: Philosophia Verlag.

Howarth, C. I. (Ed.) & Gillham, W. E. (Ed.). (1981). *The Structure of Psychology: An Introductory Text.* Routledge Chapman & Hall.

Guilford, J. P. (1967). *The Nature of Human Intelligence.* New York: McGrawhill.

Guilford, J. P. (1982). Cognitive psychology's ambiguities: Some suggested remedies. *Psychological Review, 89,* 48-59.

Hjørland, Birger (1980). *Classification Scheme developed for "Psykologisk litteratur i danske forskningsbiblioteker"* (Psychological literature in Danish Research Libraries). Copenhagen: The Royal Library, 1980. (Translated from Danish).

Hjørland, B. (1982). Hvad er almen psykologi? (What is general psychology?) *Psyke & Logos, 3,* 377-385.

Hjørland, B. (1988). Information Retrieval in Psychology. *Behavioral and Social Sciences Librarian, Vol 6* (3/4), 39-64.

Hjørland, B. (1992). The concept of "subject" in Information Science. *Journal of Documentation, 48*(2), 172-200.

Hjørland, B. (1997): *Information Seeking and Subject Representation. An Activity-Theoretical Approach to Information Science.* Westport, Conn. & London: Greenwood Press.

Hjørland, B. (1998a). Information Retrieval, Text Composition, and Semantics. *Knowledge Organization, 25*(1/2), 16-31.

Hjørland, B. (1998b). Theory and Metatheory of Information Science. A New Interpretation. *Journal of Documentation, 54*(5), 606-621.

Hjørland, B. (1998c; IN PRESS): Review of Miksa (1998), *Journal of the American Society for Information Science.*

Hjørland, B. & Albrechtsen, H. (1995). Toward a New Horizon in Information Science: Domain Analysis. *Journal of the American Society for Information Science, 46*(6), 400-425.

Hoffman, R. R. & Deffenbacher, K. A. (1994). Alternative schemes for the analysis of basic versus applied science: Beauty is still in the eye of the beholder. *Ecological Psychology, 6*(2), 125-130.

Ingwersen, P. (1994). Polyrepresentation of information needs and semantic entities: Elements of a cognitive theory for information retrieval interaction. In *ACM/SIGIR-94* (pp. 101-110). London: Springer.

Ingwersen, P. (1996). Cognitive perspectives of information retrieval interaction: Elements of a cognitive IR theory. *Journal of Documentation, 52*(1), 3-50.

Jacob, E. K. (1991). Classification and Categorization: Drawing the Line. *Advances in Classification Research. Vol. 2. Proceedings of the 2.nd. ASIS SIG/CR Classification Research Workshop.* Washington,

D.C.: American Society for Information Science, pp. 67-83.

Jacob, E. K. (1994). Classification and crossdisciplinary communication: Breaching the boundaries imposed by classificatory structure. *Advances in Knowledge Organization, 4*, 101-108. (Proceedings of the third international ISKO conference, 20-24 June 1994, Copenhagen, Denmark).

Jarosjevskij, M. G. (1980): *Psykologien i det 20.århundrede. Psykologiens udvikling i Europa, USA og Sovjetunionen.* København: Forum.

Jarosevskij, Michail Grigo'evic (1990) *A history of psycholog.* Translated from the Russian by Ruth English. Moscow : Progress Publishers.

Johnson, D. M. & Erneling, C. E. (Eds.) (1997): *The Future of the Cognitive Revolution.* Oxford: Oxford University Press.

Jørgensen, J. (1963): Hovedtræk af bevidsthedsytringernes klassifikation [Main outline of the classification of expressions of counsciousness] (Chapter VIII+IX, pp. 189-242) In: Jørgen Jørgensen: *Psykologi paa biologisk grundlag.* Copenhagen: Munksgaard.

Kant, E. (1790). *Kritik der Urtheilskraft.* (Translated by J. Creed Meredith: The Critique of Judgement. Oxford: Clarenton Press, 1969).

Karamuftuoglu, M. (1998). *Knowledge Based Information Retrieval: A Semiotic Approach.* Thesis submitted for the degree of Doctor of Philosophy. Department of Information Science, City University, London.

Kedrow, B. M. (1976). *Klassifizierung der Wissenschaften. Band 1-2*, Köln: Pahl-Rugenstein. (Translated from Russian). [A third volume is mentioned in vol. 2]

Kirk, B. A. (1958). Classifying the literature in counseling psychology. *Journal of Counseling Psychology, 5*, 89-97.

Krauth, J. (1981). Techniques of classification in psychology I: factor analysis, facet analyses, multidimensional scaling, latent structure analysis. *International Classification, 8*(3), 126-132.

Krauth, J. (1982). Techniques of classification in psychology 2: cluster analysis, typal analysis, configural frequency analysis, discriminant analysis, regression analysis. *International Classification, 9*(1), 1-10.

Kuhn, T. S. (1970): *The structure of scientific revolutions* (2rd ed.). Chicago: University of Chicago Press.

Kuiken, D., Wild, T. C., & Schopflocher, D. (1992): Positivist Conceptions of Induction and the Rejection of Classificatory Methods in Psychological Research. (Pp. 47-56 In: Tolman, C. W. (Ed.): *Positivism in Psychology. Historical and Contemporary Problems.* New York & Berlin: Springer-Verlag).

Lapointe, F. H. (1973): Origin and evolution of the term psychology. *Psychologia, 16*(1), 1-16.

Leontjev, A. N. (1977): *Problemer i det psykiskes udvikling I-III.* Kbh.: Rhodos.

Leontyev, Aleksei Nikolaevich (1981). *Problems of the development of the mind. Translated from Russian from* "Problemy razvitiia psikhiki." Moscow: Progress.

Louttit, C. M. (1933). The Dewey decimal system and psychology. *Journal of General Psychology, 9*, 234-238.

Louttit, C. M. (1941). Library classification for psychological literature. *Psychological Record, 4*, 350-364.

Luriya, A. R. (1977). On the place of psychology in the social and biological sciences. (In Russian; translated title). *Voprosy Filosofii, No 9*, 68-76.

Madsen, K. B. (1975). *Systematologi. Sammenlignende videnskabsteori for psykologer og beslægtede faggrupper.* København.

Mammen, J. (1993). The elements of psychology. Pp. 29-44 in: Niels Engelsted; Mariane Hedegaard; Benny Karpatschof & Axel Mortensen (Eds.). *The Societal Subject.* Århus: Aarhus University Press.

Mammen, J. (1998). The Psyche as "res extensa" (IN: *Fourth Congress of the International Society for Cultural Research and Activity Theory (June 7-11 1998 Aarhus, Denmark). Abstracts* (pp. 449-450). Aarhus: Institute of Psychology.

Medical Subject Headings. Tree structures (1998). Washington, D.C: National Library of Medicine.

Miksa, F. (1998). *The DDC, the Universe of Knowledge, and the Post-Modern Library.* Albany, NY: Forrest Press.

Mills, J. (1957). The Classification of a Subjetc Field (in: Proceedings of the International Study Conference on Classification for Information Retrieval held at Beatrice Webb House, Dorking, England 13th-17th May 1957. – London: Aslib, p. 29-42.

Mills, J. & Broughton, V. (1977): *Bliss Bibliographical Classification. 2. ed. Introduction and Auxilliary Schedules.* London: Butterworths.

Mills, J. & Broughton, V. (1978): *Bliss Bibliographical Classification. 2. ed.* Class I: Psychology and Psychiatry. London: Butterworth.

Munday, E. (1979). When is a Child a "Child"? Alternative Systems and Classification. *Journal of Anthropology Society of Oxford, 10*(3), 161-172.

Needham, J. (1943). Integrative Levels: A Revaluation of the Idea of Progress (1937 Herbert Spencer Lecture, reprinted in: J.Needham: *Time: the Refreshing River.* London.

Ovesen, J. (1989). Classificare Necesse Est. Lidt om klassifikation i antropologien – og også ellers. (i:

Orden i papirerne – en hilsen til J.B. Friis-Hansen. Ed. by Ole Harbo and Leif Kajberg. Copenhagen: Danmarks Biblioteksskole. Pp. 117-122.

Pedersen, J. (1982). Concerning the main structure of a new schedule for psychology within the Universal Decimal Classification. *International Forum Information Documentation, 7*, 16-21.

Platonov, K. K. & Mirimanova, M. S. (1983). The Object-oriented Thesaurus in Psychology. *Naucho-Technicheskaya Informatsiya, Seriya 2, 17*(3), 14-18.

Poffenberger, A. T. (1917). A library classification for books on psychology. *Psychological Bulletin, 14*(9), 328-331.

Poulsen, H. (1982). Leontjev, genspejlingsbegrebet og den almene psykologi. Kommentarer til Ole Dreier og Benny Karpatschof. *Psyke & Logos, 3*, 161-175

Rescher, N. (1979). *Cognitive Systematization. A Systems-theoretic approach to a coherent theory of knowledge.* Oxford.

Rice, R. W. (1978). Formal Classification of Research Information. An Empirical Test of the McGrath-Altman Approach and an Illustrative Case. *American Psychologist, 33*, 249-264.

Rosenzweig, M. R. (1992). Unity and diversity of psychology. International Association of Applied Psychology: The unity of psychology (1990, Kyoto, Japan). *International Journal of Psychology, 27*(5), 283-290.

Ruckmick, C. A. (1926). A schematic classification of general psychology. *Psychological Review, 33*, 397-406.

Sams, T; Laursen, P; Eskelunen, L. (1994). Response Classification in Psychological Testing Using a Neural Network. *International Journal of Neural Systems, 5*(3), 253-256

Samurin, E.I. (1967). *Geschichte der bibliothekarisch-bibliographischen Klassifikation.* Band I-II. München: Verlag Dokumentation. (Translated from Russian).

Scheerer, E. (1989). Psychologie. In*: Historisches Wörterbuch der Philosophie* (Bd. 7, S. 1599-1653). Hrsg.: J. Ritter & K. Gründer. Darmstadt: Wissenschaftliche Buchgesellschaft.

Schonpflug, W. (1993). Applied psychology: Newcomer with a long tradition. *Applied Psychology: An International Review, 42*(1), 5-30. [This article is debated by de Wolff; Landy; Louw; and Semmer in the same issue of the journal]

Schultz, D. P. & Schultz, S. E. (1996). *A History of Modern Psychology.* Sixth edition. Philadelphia: Harcourt Brace College Publishers.

Schultz, E. (1988). *Personlighedspsykologi på erkendelsesteoretisk grundlag. Eller Mysteriet om personen der forsvandt.* København: Dansk Psykologisk Forlag.

Shapere, D. (1977). Scientific theories and their domains. In F. Suppe (Ed.), *The structure of scientific theories* (2rd ed., pp. 518-599). Urbana: University of Illinois Press.

Shapere, D. (1984). *Reason and the search for knowledge: Investigations in the philosophy of science* (Boston Studies in the Philosophy of Science vol. 78). Dordrecht: D. Reidel.

Shapere, D. (1989). Evolution and continuity in scientific change. *Philosophy of Science, 56*, 419-437.

Soudek, M. (1980). On the classification of psychology in general library classification schemes. *Library Resources & Technical Services, 24*(2), 114-128.

Soudek, M. (1983). The inadequate treatment of psychology in general library classification schemes. *Canadian Psychology, 24*(3), 181-189.

Thorne, F. C. (1964). Diagnostic classification and nomenclature for psychological states. *Journal of Clinical Psychology, 20*(1), 3-60.

Tolman, C. W. (1992): Watson's positivism: Materialist or phenomenalist? In: C. W. Tolman (Ed.): *Positivism in Psychology. Historical and Contemporary Problems*, pp. 83-102. New York: Springer Verlag.

Tuttle, R. H. (1999). Taxonomy. The objectives of biological classification. In: The biological sciences. *Britannica® CD 99 Multimedia Edition.* Chicago, IL: Encyclopaedia Britannica, Inc., © 1994-1999

Vandekemp, H. (1980). Origin and Evolution of the Term Psychology – Addenda. *American Psychologist, 35*(8), p.774. (Note)

Vandekemp, H. (1983): A note on the term psychology in English titles – predecessors of Rauch. *Journal of the history of the behavioral sciences, 19*(2), p. 185.

Vickery, B. C. (1960): *Faceted Classification. A Guide to the Construction and Use of Special Schemes.* London: ASLIB.

Walker, A. (Ed.). (1991). *Thesaurus of psychological index terms.* 6th. ed. Washington, D.C.: American Psychological Association.

Warnke, C. (1972). Klassifikation der Wissenschaften. In: Klaus, G. & Buhr, M. (Eds). *Marxistish-Leninistisches Wörterbuch der Philosophie.* Neubearbeitete und erweiterte Ausgabe (vol. 2, pp. 629-633). Reinbek bei Hamburg: Rowohlt Taschenbuch Verlag.

White, H. D., & McCain, K. W. (1998). Visualizing a discipline: An author co-citation analysis of information science, 1972-1995. *Journal of the American Society for Information Science, 49*(4), 327-355.

Whitley, R. D. (1984). *Intellectual and social organization of the sciences.* Oxford: Clarendon.

Willoughby, R. R. (1932). A classification for psychology. *Journal of General Psychology, 7*, 179-185.

Winograd, T., & Flores, F. (1986): *Understanding computers and cognition: A new foundation for design.* New York: Addison-Wesley.

Birger Hjørland, Royal School of Library and Information Science, Copenhagen, 6 Birketinget, DK-2300 Copenhagen S., email: bh@db.dk

Erratum

In my article in Knowledge Organization, (Hjørland, 1998, p. 26) I quoted Smith (1981, p. 84) for fifteen reasons why authors quote other documents. Smith, however, is only a secondary source of this information. The primary source is Garfield (1965, p.85), which I should have acknowledged in the article. (Unfortunately , I also made the same mistake in Hjørland, 1997, p. 149-150). I am sorry, and the error is my solely responsibility. (By the way, a very important update of the problem on norms of citing behavior is Garfield, 1996).

References

Garfield, G. (1965). Can citation indexing be automated? *In Statistical Association Methods for Mechanized Documentation. Symposium Proceedings, Washington, 1964.* (National Bureau of Standards Miscellaneous. Publication. 269, ed by Mary E. Stevens, et al., p. 189-192). Reprinted in *Essays of an Information Scientist*, vol. 1, 1962-1973, p. 84-90. Also available on the Internet: http://165.123.33.33/eugene_garfield/essays/V1p084y1962-73.pdf

Garfield, G. (1996) When to cite. *Library Quarterly, 66*(4), 449-458. Also available on the Internet: http://165.123.33.33/eugene_garfield/papers/libquart66(4)p449y1996.pdf

Hjørland, B. (1997). *Information Seeking and Subject Representation. An Activity-Theoretical Approach to Information Science.* Westport, Connecticut: Greenwood Press.

Hjørland, B. (1998). Information Retrieval, Text Composition, and Semantics. Knowledge Organization, 25(1/2), 16-31.

Smith, L. (1981). Citation Analysis. *Library Trends, 30*, 83-106.

Birger Hjørland