Rethinking the culture-economy dialectic

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chapter 2

ON CONCEPTS AND CONCEPTUAL ANALYSIS

In the beginning was the Word, and the Word was with God, and the Word was God.
John 1:1

A good word is like a good tree whose root is firm, and whose branches are in the sky; it gives its fruit at every season by the permission of its Lord. (…) *And the likeness of a bad word is as a bad tree, which is felled from above the earth, and has no staying place.*
Quran 14:24-26

2 / 1 / introduction

In the introduction to this book it was stated that its focus is on the conceptual and theoretical history of the culture - economy dialectic. One of the research goals is to explain what is or was meant by questions and statements about the relationships between culture and economy. Hence, part of this book is (a form of) concept(-ual) analysis (CA). However, there is no single field, theory or methodology of CA. Rather, there is a whole gamut of different approaches related to concepts and the elucidation of their meaning. This chapter is intended to give a brief (or at least as brief as possible) overview of these fields and sub-fields of CA resulting in some kind of synthesis which will provide the methodological framework for (some) later parts of the book. Hence, this chapter's ultimate goal is to construct a general model of concepts and a methodology of CA in social science.
Like all human behaviour, science is a linguistic effort. Without language there would be no science. Language provides the building blocks for science. Concepts and grammar (semantics and syntax) are the bricks and mortar of language. Sometimes, however, these bricks seem to be made out of jelly. CA is the elucidation of vague, but often very common, concepts. Famous early predecessors of conceptual analysis, Socrates and Plato, for example, discussed (mainly) ethical concepts, such as "goodness", in an attempt to find objective descriptions or definitions of these concepts. (Section 2.2 deals with the history of conceptual analysis.)

Conceptual clarity is necessary to enable reasonable communication within (social) science: 'A good word is like a good tree whose root is firm, (…) it gives its fruit at every season' (Quran 14:24). The 'bad trees', on the other hand, are the all too ambiguous concepts that cause misunderstanding and other problems in science and philosophy. Wittgenstein argued, for example, that (a lot of) philosophical problems originate from erroneous use of language: 'Denn die philosophischen Probleme entstehen, wenn die Sprache feiert' (Wittgenstein 1953, § 38). The same is (to a large extent) true in (social) science.
In the introduction to this book (§ 1.2), three arguments for a conceptual analysis of the culture - economy dialectic (CED) were mentioned. The first of these (*the abundance of theories and empirical operationalisations led to a growing conceptual contestation and confusion*; see § 1.2.1) is most strongly related to Wittgenstein's argument. The second and third arguments (2: *the CED and its history played an important role in the history of the social sciences*; and 3: *studying culture may imply studying (the social roles and meanings of) concepts*; see § 1.2.2) were of a very different nature. The second points at a conceptual evolution in the CED and is dealt with in subsubsection 3.2.2.
The third argument is related to the very complex problem of the relationships between culture, language and reality. This chapter studies conceptual analysis as a method for the analysis of the CED. However, conceptual analysis is not mere methodology. Language, rules, meaning and culture are closely linked. Studying culture implies studying language (*e.g.* Winch 1958). '[L]anguage affects and reflects culture just as culture affects and reflects what is encoded in language' (Fantini 1995, p. 145). Similarly, language reflects reality just as reality is perceived through the categories of our language. Before focusing on conceptual analysis and the concept of "concept" itself (in subsection 2.1.2), it may, therefore, be useful to look at the complex relationships between language, culture and (the perception of) reality.

2 / 1 / 1 / language, culture and reality

Social reality is conceptually structured. We perceive, understand and classify social reality through our conceptual categories. 'Language, in fact, both reflects and affects one's world view, serving as a sort of road map to how one perceives, interprets and thinks, and expresses about the world' (Fantini 1995, p. 144). Mediated by our concepts, it is our culture that thinks in us (Gellner 1992).
The – by far – best known theory on the influence of language on our perception of reality is the Sapir-Whorf thesis (SWT). SWT is a form of conceptual relativism, but not the first or only form. Conceptual relativism claims that different groups have different languages with different concepts and, therefore, different interpretations and/or perceptions of reality. Conceptual relativism or related ideas can be found in the work of (among others) Locke, Hamman and Herder (see *e.g.* Aarsleff 1982;1988) and Kant (1781/7), who claimed that perception without concepts is blind. The most important predecessor of SWT, however,

was Wilhelm von Humboldt. According to Humboldt, who was strongly influenced by Herder, language gives shape to the intellectual life of nations and societies. Language is not just a means of communication, language is thought; our language determines the conditions of our life. (Humboldt 1836; 1836-9; Hennigfeld 1976; Aarsleff 1982; 1988) SWT was (re-)introduced by Sapir and Whorf in the early 20th century, but some scholars claim that Nietzsche and/or Korzybski forrwarded a similar thesis earlier (*e.g.* Hennigfeld 1976; Pula 1992). Sometimes, especially by anthropologists, Boas is mentioned as one of the fathers of SWT as well (*e.g.* Hill & Mannheim 1992).
SWT can be summarised pretty well by these two quotes from its founding fathers:

> [T]he 'real world' is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. (Sapir 1929; p. 209)

> We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organised by our minds – and this means largely by the linguistic systems in our minds. We cut nature up, organise it into concepts, and ascribe significances as we do, largely because we are parties to an agreement that holds throughout our speech community and is codified in the patterns of our language. The agreement is, of course, an implicit and unstated one, but its terms are absolutely obligatory; we cannot talk at all except by subscribing to the organisation and classification of data which the agreement decrees. (Whorf 1956, p. 213)

SWT consists of two parts: (1) linguistic determinism and (2) linguistic relativity. Linguistic determinism is the hypothesis or theory that the language we use determines (to some extent) how we perceive the world and how we think about it:

> English and Chinese are simply two different ontological systems. To learn a foreign language is to study a different ontology. Therefore, to communicate with an alien culture is not to absorb the truths it discovered, but to learn to see or think of the world in a different way. (Zhifang 2002, p. 169)

Perception starts with and is determined by conceptualisation: 'In the beginning was the Word, (…) and the Word was God' (John 1:1). In the strong version of the theory of linguistic determinism, language determines perception and thought; in the weak version language merely influences these. Linguistic determinism is the most contested part of SWT. Lucy (1997) categorises and reviews the empirical research on (this part of) SWT and concludes that more and better research is needed. Recently Davidoff (2001) found some evidence for the strong version of linguistic determinism.

SWT claims that we perceive culture and economy, *because* we have these concepts "culture" and "economy". Other languages with other classifications are possible, have existed, and still exist. The CED itself may be the product of our conceptual classification not of some distinction that is really 'out there'. The CED is a product of Western thought and language, not a universal phenomenon and/or scientific problem. The Japanese language, for example, does not have an equivalent of "culture" (although, according to Mishima (1984), *iki*, *furyu*, *miyabi* and *do* all come near to *some* interpretations of "culture", but neither can be used in compound terms as is common practice with "culture").

According to linguistic relativity, categories, concepts or classifications are unique to specific languages. Language divides or classifies reality in arbitrary concepts or categories and there is no limit to the number of possible classifications. Hence there is no limit to the conceptual diversity among languages. Cultural differences between conceptual classifications have been studied by numerous scholars (*e.g.* Whorf 1956; Brown 1958; Hunn 1982; Lakoff 1987; Waxman 1991; Clark 1991; Anglin 1995). Wierzbicka (1991) found that even truisms are culture specific. Concepts are, however, not just *different* between cultures, but '[c]oncepts are heavily determined by cultural tradition' (van Loocke 1999, p. 4). Some scientists (*e.g.* Hill & Mannheim 1992; Grucza 2000) reject the distinction between language and culture altogether. Different ways to classify reality and/or experience are often determined by differences in practical utility and cultural significance (Anglin 1995): 'Of the indefinitely large number of concepts that humans are capable of forming, words are coined for those conceptual categories and distinctions that are functionally important enough for people to communicate about with each other' (p. 176).

SWT did not finish with Sapir and Whorf of course (see *e.g.* Hill & Mannheim 1992 or Hunt 2001 for an overview of more recent work on SWT) and there are some theories related to SWT within philosophy. Linguistic relativity is related to Davidson's (1974) 'conceptual schemes'. "Objects' do not exist independently of conceptual schemes. *We* cut up the world into objects when we introduce one or another scheme of description' (Putnam 1981, p. 52; see also Goodman 1972). Linguistic determinism is (a.o.) related to Hanson's (1958) claim that perception is theory-laden, Foucault's (1969) discursive construction of social reality and social constructivism (in general). The term 'social constructivism' was coined by Berger and Luckmann (1966). Early predecessors were (a.o.) Berkeley's (1710) idealism and Marx and Engels (1846/1932) on the influence of ideology on social reality. Constructivism generally claims that science constructs the perception and representation of reality. However, some constructivists go one step further and make the ontological claim that science constructs reality itself.

SWT has drawn much critique. In particular linguistic determinism is fiercely contested (*e.g.* Bunge 1974; Pinker 1994; 1997). Bunge (1974) claims that language does not influence perception or thought, but that language is ontologically neutral, although some languages (ordinary / natural languages especially) are not rich enough to express certain

ideas about reality. Strangely, Pinker's (1994) widely acclaimed critique of SWT does not deal with any other languages (or cultures) than English (*e.g.* Wierzbicka 1997) and should on this ground alone be rejected as a serious contribution to the debate.

As conceptual classifications are determined by practical utility and cultural significance (Anglin 1995), they are subject to change. Concepts are subjective and changing tools to deal with a complex world. There are evolutionary paths from manual skills to the concepts in (of) language(s) (Arbib & Rizzolatti 1999). Our concepts are the result of an evolutionary process of adaptation to changing circumstances (*e.g.* Slurink 2002). This, however, does not imply that our conceptual structure is always and necessarily the best possible representation of reality (of the time). Concepts are developed as representations of reality in order to increase fitness, not to create a mirror of the environment (Peschl 1999). Moreover, as circumstances change permanently, we are always one step behind. And to complicate things even further, circumstances do not only vary over time but also over space and over social groups. Evolutionary change is not teleological. It is a process dependent on reproductive success. Conceptual evolution, similarly, is dependent on the (re-) productive success of concepts and/or conceptual structures. Conceptual evolution does not lead to more *objective* or *truthful* conceptual representations of external reality; it only advances those concepts that are most (*re*-) *productive* in theoretical developments and practical applications.
The question, of course, is how to build a (social) science on a subjective and changing conceptual foundation. There are two basic strategies available to deal with this problem. The first is to restrict theorising to a model of reality instead to reality itself. This is the path chosen by mainstream economics. However, if science is to make claims about the real world rather than some mathematical model, this does not seem to be the most appropriate or (even) obvious path. The second strategy starts with recognition of the fact that our conceptual representation of reality is (necessarily) far from perfect, and with a critical evaluation of the concepts we use and how these concepts shape our interpretation of reality. This second strategy implies that every research project should start with conceptual analysis.

2 / 1 / 2 / on words and concepts

Conceptual analysis (or concept analysis) is the analysis of concepts. However, the concept of "concept" itself is far from clear:

> [T]here is considerable disagreement about what exactly a concept is. Psychologists tend to use 'concept' for internal representations, for example, images, stereotypes, words that may be vehicles for thought in the mind or brain. Logicians and formal semanticists tend to use it for sets of real and possible objects, and functions defined over them; and philosophers of

> mind have variously proposed properties, 'senses', inferential rules or discrimination abilities. (Rey 1998, p. 505)

"Concept" is a member of a set of related concepts that also includes (a.o.) "word" and "term". Words as lexical items 'are triplets of phonological structure, syntactic structure, and meaning' (Jackendoff 2002, p. 51). Elsewhere Jackendoff speaks of 'long term memory associations' instead of 'triplets' and of 'conceptual features' as synonymous to 'semantic features' (2002, p. 130). A word then, is just a convenient label for a concept. The concept is the meaning of a word. The difference is illustrated nicely and very interestingly in Motter *et al*. (2002), who defined two *words* similar if they represented more or less the same *concepts* and mapped these connections between words in the English language. They found that 'one only needs three steps on average to connect any two words in the 30.000-words dictionary' they used and that 'in fact, less than 1% of the words require more than four steps to be reached from any given word' (p. 065102-2).

Concepts have been studied form various, very different, perspectives. Pathak (2000), for example, distinguishes eight types of research on concepts, some of which are subdivided even further. The bulk of the research on concepts, however, can be divided up into three main types or fields: (1) philosophical research, (2) research on concepts in social science, and (3) concept analysis for improvement of knowledge and information exchange, as in nursing or computer science. These three research fields are, however, closely linked.

Different goals and different sets of concepts for analysis may result in different concepts of "concept" and different interpretations of the concept of "concept" may induce different approaches in studying them. Roughly speaking, concepts of "concept" are positioned on a scale from very general to very specific. Most general are the interpretations of "concept" in psychology and most of philosophy. For example, Laurence and Margolis 'take concepts to be sub-propositional mental representations' (1999, p. 4). Hence, anything in our thought smaller than a (short) sentence is a concept. Even more abstract, Barsalou *et al.* claim that 'concepts are models for types of individuals in world models' (1993, p. 23). (More about the different philosophical theories on the nature of concepts in § 2.2.3.) A little bit less general are definitions of "concept" as applied in concept analysis in social science and concept analysis for information exchange. Sartori (1984b), for example, defines concepts as the basic units of thinking and claims that: 'It can be said that we have a concept of A (or of A-ness) when we are able to distinguish A from whatever is not-A' (p. 74). Concepts are nouns or sometimes adjectives or verbs (or, even more rarely, compounds of these with a meaning different from their parts) referring to something in extra-linguistic reality. Dahlberg (1978), working in the same field as Sartori, suggests regarding concepts as units of knowledge, rather than as units of thought. However, the standard definition of "concept" with respect to social science terminology is established in ISO 1087 (see § 2.3.1), where a concept is (defined as) 'a unit of thought constituted through abstraction on the basis of properties common to a set of objects' (def. 3.1).

Very specific are the notions of "concept" as applied in conceptual history (*Begriffsgeschichte*) and management fashion research, fields that are not recognised by Pathak (2000) (and most other scientists and philosophers of language and concepts) as belonging to the concept research field. The specific interpretation of "concept" in these fields is, of course, related to the very specific types of concepts studied. According to Koselleck (1972), the leading figure in conceptual history, concepts are not just words: concepts, or better *geschichliche Grundbegriffe*, are social factors with systematically ambiguous meaning. Similarly, the philosopher and anthropologist Gellner (1992) interprets concepts as socially shared compulsions. Concepts as social factors do not only describe social and political reality, but partly also (re-)produce it. Concepts are systematically ambiguous in the sense that they, contrary to other words, cannot be disambigued by a certain context. Concepts are ambiguous, whatever the context (see § 2.4.1). Gallie (1956) regarded many concepts in (a.o.) social and political philosophy to be *essentially contested*. These concepts are necessarily ambiguous because of their function in philosophical and scientific debates.
In management fashion research, the concept of "concept" has a similar (but not identical) specific meaning. However, the term "concept'" is not used very often. The term "management concept" is more or less synonymous to "management fashion" and to "management theory". These three different terms only differ according to which part of the phenomenon they emphasise. A concept (in this sense) is term, theory (content) *and* context (which includes the fashion perspective). As in conceptual history, management concepts are social factors and are systematically ambiguous. (*e.g.* Abrahamson 1991; 1996; Benders & van Veen 2001) (see § 2.4.2) The theory-ladenness and ambiguity of concepts in these more specific interpretations was advanced earlier by a number of analytical philosophers, including Popper (1935), Hempel (1952) and Wittgenstein (1953), although Hanson (1958) was probably the first to actually use the term "theory-laden". Popper argued that concepts are references to extra-linguistic reality within a theoretical framework and that, therefore, all concepts are theoretical. According to Hempel, concept formation and theory formation 'constitute virtually two different aspects of the same procedure' (1952, p. 2).
In a philosophical analysis of the phenomenon of management concepts ten Bos (2000) argues in favour of the fashion-perspective usually adopted in the management fashion literature and against a more utopian perspective (as in definitional analysis). He claims that concepts, and the theories they are labels of, should be seen as fleeting fashions, not as utopian final truths. This fits nicely within the evolutionary perspective on concepts (in general) mentioned above. Concepts should be seen as part of their temporal and social context. In most approaches to conceptual analysis this is, however, hardly the case.

Moving from the very general to the very specific, the concept of "concept" becomes less of a ontologically neutral building block of thought and language, and more of a theory-laden and reality-shaping social phenomenon. The position most of analytic philosophy may be characterised as somewhere in the middle. The perspective chosen depends on the

goals of the analysis but also affects its outcomes. For studying language in general (within, for example, a psychological or cognitive framework), the most general perspective is probably the most appropriate. For studying the influence of political history on the changing meaning of concepts and the other way around, the very specific perspective of *Begriffsgeschichte* is more fitting. The question is: where does (and/or should) concept analysis in social science fit in?
The language of social science contains words of various types. It includes various connectors and prepositions, which usually have very clear meanings. Accordingly, these are not the subject of concept analysis. The concepts studied, on the other hand, are mostly nouns (or sometimes adjectives or verbs) describing complex social phenomena. The website of the Committee on Concepts and Methods of the International Political Science Association (IPSA) (www.concepts-methods.org) hosts a bibliography of 86 social and political science concepts (last checked in March 2005), all of them nouns, all of them describing social phenomena or ideas (instead of things).
Social science concepts are strongly theory-laden. They are usually introduced as a part of a theory and are often even the catchwords of theories. In a sense, social science concepts are not just theory-laden, but theories in themselves. As theoretical concepts, social science concepts shape our perception of social reality. By implication, social science concepts are social factors. Moreover, social science concepts seem to be systematically (or essentially; Gallie 1956) ambiguous. (However, whether the ambiguity of these concepts is truly systematic or a curable consequence of sloppy use of language, is a point for discussion.) Hence, social science concepts are very similar to the concepts studied in *Begriffsgeschichte* and management fashion research. Like management fashions and *geschichliche Grundbegriffe*, social science concepts are ambiguous, theory-laden social factors.

2 / 1 / 3 / this chapter

The division into sections of this chapter is partly based on the interpretations of the concept of "concept" described above and partly on the *degree of isolation*. The latter refers to the subject of the philosophies and theories presented. The first sections deal with the analysis of isolated concepts, later sections deal with pairs and systems of concepts.
Section 2.2 describes the history and concepts of conceptual analysis in philosophy. The application thereof on a number of fields and the (formal) methods used are the topic of section 2.3. This division coincides with that in the section above: 2.2 deals with very abstract concepts; section 2.3 with the more intermediate conception of "concept" in (a.o.) the social sciences. Theories of concepts as social factors or theories, such as *Begriffsgeschichte* and management fashion theory are explained in section 2.4. These theories also share their strong emphasis on the temporal context of concepts.

The other sections of this chapter – as mentioned – relax the isolation of concepts. Section 2.5 deals with pairs of opposing concepts in dialectics, deconstruction and similar theories. Section 2.6 describes approaches to analyse conceptual systems or structures, languages and ontologies. The concluding section 2.7 is an attempt to reach some kind of synthesis in a general methodology of conceptual analysis.

2 / 2 / conceptual analysis in philosophy

Conceptual Analysis (CA) as a current in (analytic) philosophy emerged in Cambridge (UK) during the first half of the twentieth century. Its main representative was Moore. Important influences were Locke, Kant and Frege's analysis of numbers. The movement spread to Oxford with Ryle and Austin and from there to the United States. Heavily criticised by (a.o.) Quine (in what was itself a brilliant conceptual analysis of the concept of "analyticity"), it was more or less extinct by the end of the 1970s.
Language has been a subject of philosophical inquiry since earliest times. How philosophers in different periods dealt with language, however, changed considerably. Besides analytical philosophy, several other fields both in and outside philosophy dealt and deal with language, concepts and meaning. This section deals with conceptual analysis as part of analytic philosophy (§ 2.2.1), with other philosophical currents dealing with language and meaning (§ 2.2.2) and gives a (very) brief overview of philosophical ideas on concepts, meaning, definition, etc. (§ 2.2.3).

2 / 2 / 1 / a short history of conceptual analysis

The early history of CA started in Greek Antiquity. According to Aristotle (*Metaphysica*), Socrates was the first who practised conceptual analysis. Socrates, however, was only interested in ethical concepts. His most important student, Plato (*the Republic, Phaedrus*, *Eutyphro*), also attempted to analyse non-ethical concepts (although the main focus remained on ethical concepts). According to Plato, less common concepts had to be understood as species or parts of more common concepts and more common concepts had to be taken apart into their less common parts. Plato and his most important student, Aristotle, asserted that definitions had to be discovered in some absolute metaphysical realm. Words had a true meaning that should and could be discovered.
The main question about concepts after Antiquity, in the Medieval period, was not so much on meaning or analysis, but on the metaphysical nature of concepts. Following Plato and Aristotle, 'realists' believed that concepts as universals actually exist independently of the things represented by those concepts. 'Nominalists', on the other hand, believed that

universals are nothing but names and that only the objects they refer to actually exist. (*e.g.* Moreland 2001; see also § 5.2.3)
There is no easy demarcation of a second start (after Antiquity) of the problematisation of the meaning of concepts, of conceptual analysis, but there are some important predecessors of modern conceptual analysis in the centuries following the Middle Ages. One of the first of these may have been Francis Bacon, one of the founding fathers of empiricism and the modern scientific worldview. Bacon (1620) distinguished four types of 'idols', false preconceptions or falacious tendencies of the human mind, the third of which was the *idola fori* (the idol of the marketplace). The *idola fori* is the confusion arising from the overestimation of the objectivity and rigor of language. Concepts are used sloppily, while often the contrary is expected or assumed, which makes language misleading.
One of the goals of Leibniz (and many of his contemporaries) was the construction of a general theory of language including logic, semantics, syntax and pragmatics. Leibniz wanted to construct a language based on one-to-one relations between symbols or signs and simple concepts. He never achieved this goal. Leibniz's most important contribution to CA may have been his claim that a concept is clear if it enables us to recognise the objects falling in its categor; in other words, when it provides clear boundaries of that category (Leibniz 1684).
Most influential on 20th century CA within analytic philosophy were, probably, Locke and Kant. Locke (1690) argued that complex general ideas had to be decomposed in sets of more simple ideas. Kant (1781/7) distinguished analytic from synthetic propositions. The first being true (or false) by virtue of their conceptual (and logical) content alone; the latter being true (or false) by virtue of conceptual content plus some non-conceptual element. (For more on Kant's considerable influence on analytic philosophy see *e.g.* Hanna 2001.)

Although it is usually claimed that analytic philosophy started with Moore, it seems to be justifiable to include Frege. Especially Frege's (1879) *Begriffsschrift* (a system of symbolic logic), his analysis of mathematical concepts (especially numbers) (1884) and his distinction between *Sinn* (sense) and *Bedeutung* (reference) of a concept (1892) were profoundly influential. The founding father of modern CA was the Cambridge-based philosopher Moore. Moore believed that philosophical problems do not arise from the world or from science but from the works of other philosophers, especially from the intentions of these works (Moore 1942a). The main goal of Moore's philosophy (1922; 1959) was, therefore, the analysis of ordinary language. His method of CA consisted of three parts: (1) inspection: the researcher studies the concept and tries to explain it as clearly as possible; (2) decomposition: clarification by decomposition of the concept in its composing parts (compare Locke, above); and (3) delimitation: specification of the limits or boundaries of the concept. The second part hereof seems to be the most important (Moore 1942b) and usually took the form of a traditional definition *per genus et differentiam specificam* (a specification of the broader type (*genus*) and what distinguishes the concept from this broader type (*species*)).

Next to Frege and Moore, the most important figures in early analytic philosophy were Russell and Wittgenstein, also Cambridge-based. Russell deemed ordinary language unfit for science or philosophy. Ordinary language is too vague, too confused and too full of errors to make it possible to correctly express fundamental philosophical truths. By careful analysis, some of these problems, however, may be cured. With Whitehead, Russell wrote a rigorous analysis of mathematical concepts, the *Principia Mathematica* (Whitehead & Russell 1910-3).
The early Wittgenstein (1922) set out to show the limits of language. According to Wittgenstein, language distorts and limits thought and, in doing so, limits reality: '*Die grenzen meiner Sprache* bedeuten die Grenzen meiner Welt' (5.6). Language, however, not only limits, but is limited itself; that is, its meaningful use is limited. Wittgenstein asserted that a lot of, especially philosophical, language use was (and is) senseless:

> Die meisten Sätze und Fragen, welche über philosophische Dinge geschrieben worden sind, sind nicht falsch sondern unsinnig. Wir können daher Fragen dieser Art überhaupt nicht beantworten, sondern nur ihre Unsinnigkeit feststellen. Die meisten Fragen und Sätze der Philosophen beruhen darauf, daß wir unsere Sprachlogik nicht verstehen. (4.003)

On definitions, Wittgenstein claimed that these are rules for translation: 'Definitionen sind Regeln der Übersetzung von einer Sprache in eine andere' (3.343).
The most important centre of early analytic philosophy outside Cambridge was Vienna. In Vienna, a group of philosophers and scientists regularly met in the *Wiener Kreis*. (The best introduction to their philosophy is available in Ayer 1936.) The (probably) most important member of the *Wiener Kreis* was Carnap. Carnap wrote about the *Wiener Kreis*: 'In our discussions in the Vienna Circle it had turned out that any attempt at formulating more precisely the philosophical problems in which we were interested ended up with problems of the logical analysis of language' (Carnap 1963, p. 55). Carnap (1928) warned for *Sphärenvermengung*, the neglect of distinctions of logical types of concepts. On his book *Logische Syntax* (1934), he later wrote that 'many philosophical controversies actually concern the question whether a particular language form should be used' (1963, p. 54), and that 'Language analysis, in our view the most important tool of philosophy, was first systematized in the form of logical syntax; but this method studies only the forms of the expressions, not their meanings. An important step in the development of language analysis consisted in the supplementation of syntax by semantics, i.e., the theory of the concepts of meaning and truth' (Carnap 1963, p. 60).

Two attacks ended the early period of analytic philosophy and CA. The first was the *paradox of analysis* (Langford 1942), the second were *the two dogmas of empiricism* (Quine 1951; dogma 1: the analytic - synthetic distinction; dogma 2: the assumption that all statements may be reduced to statements about immediate experiences). Langford (1942) introduced the term "paradox of analysis" (although the idea was older) for a major

problem in the theory of CA: for an analysis to be correct, both concepts (the *analysandum* and the *analysans*) must be completely identical. Hence CA is tautological, trivial and non-informative and epistemologically useless (or shorter: analyses are either trivial or wrong). Important reactions to Langford include those by Black (1944) and White (1945). Moore himself, at whom Langford's attack was primarily aimed, recognised the paradox but had no solution. Several solutions of the paradox have been proposed. Most, however, are not very successful. Hanna (1998), for example, offers a solution based on the work of Kant. He claims that an analytic definition of a concept offers important novel *noetic* information but no semantic information, hence that an analysis is informative after all. (Carnap suggested a solution of the paradox based on the notion of "intensional isomorphism", which is dealt with in subsection 2.2.3.)

Far more damaging than the paradox of analysis was Quine's (1951) analysis of the concept of "analyticity". The shortest possible definition of "analytic" probably is "true by definition plus logic". Quine claimed that analyticity is based on synonymy and that every analysis of synonymy ends in circularity. As analyticity cannot be analysed it is not a useful analytic concept, neither is there an empirical clarification of the distinction between analytic and synthetic statements. Hence, the concept of "analyticity" (and CA with it) has to be abandoned. (On the problem of analyticity see also Bealer 1998.) Moreover, concepts cannot be analysed apart from the broader structure they are part of. Concepts derive their meaning from the (theoretical) structure and the social group they belong to. According to 'confirmation holism' (also known as the 'Quine-Duhem thesis'), theories can only be tested and confirmed (or refuted) as a whole.

Grice and Strawson (1956) answered Quine's attack with 'a defence of a dogma'. They claimed that the deep-rooted use of the distinction in philosophy alone provides enough reason not to abolish it. Moreover:

> Quine requires of a satisfactory explanation of an expression that it should take the form of a pretty strict definition but should not make use of any member of a group of interdefinable terms to which the expression belongs. (…) It would seem fairly clearly unreasonable to insist *in general* that the availability of a satisfactory explanation in the sense sketched above is a necessary condition of an expression's making sense. It is perhaps dubious whether *any* such explanations can *ever* be given. (p. 148)

As Grice and Strawson asserted that an explanation in the strict sense as assumed by Quine may be impossible, they also answer Langford, who based his paradox on the same strict interpretation. As Quine's analysis of the concept of "analyticity" and Langford's paradox are based on a very strict (classical) interpretation of analysis, it may be the case that they, rather than refuting analyticity itself, refuted this strict interpretation. A less strict interpretation of analysis is needed: 'The fact, if it is a fact, that the expressions cannot be explained in precisely the way Quine seems to require, does not mean that they cannot be explained at all' (Grice & Strawson 1956, p. 149).

After Langford and Quine, philosophy of language moved into new directions. These changes were reinforced by the publication of Wittgenstein's *Philosophische Untersuchungen* (1953). The later Wittgenstein was (a.o.) influenced by American pragmatism (see § 2.2.2). According to Wittgenstein, the meaning of a word is its use (§ 43). Concepts derive their meaning from rules guiding their use. Knowing a concept is not knowing its definition but being aware of its role in thought and communicative practice. Inspired by Wittgenstein, Kuhn (1962) later asserted that someone understands or has a concept if he understands theories in which that concept is used and/or can reason with that concept.

Wittgenstein introduced the concept of "language-game". The concept refers to the use of language in a specific context. Its main merit was to focus the attention of linguists and philosophers on the context of language use: the socio-cultural group a specific word or sentence is used by, the background of the members of this group, the characteristic situations in which the word or sentence is used, and so forth. Although extremely influential, Wittgenstein was not part of the movement of CA itself. This movement moved from Cambridge to Oxford, where Ryle, Austin and Strawson were the most important names in the second phase of analytical philosophy. They were heavily influenced by Moore and Wittgenstein and believed that most philosophical problems are caused by a limited insight in the workings of language.

According to Ryle (1932), philosophical analysis of ordinary language may clarify human thought by eliminating misleading and/or wrong linguistic forms. Philosophers should not study meaning, but why certain combinations of expression make no sense. A special case of such a senseless expression is the *category mistake*. Ryle (1949) claimed that concepts belong to categories and that concepts from different categories should not be confused. Philosophical confusion grows from category mistakes, misapplication of categorically different terms. In his most famous book, *The concept of mind* (1949), Ryle exposed a category mistake by dualists, who see the psychical and the physical as belonging to the same category of substance.

Austin, an admirer of Moore, published very little during his lifetime. Austin was mainly interested in ordinary language. His main concern was: what to say when. Austin was convinced that (1) ordinary language contains all the distinctions people found necessary to make; hence, ordinary language is a far more powerful and subtle tool than usually recognised; (2) philosophers misuse language; and (3) philosophical progress is possible by careful examination of the vocabulary in which a problem arose (Austin 1961, 1962). Strawson (1959) asserted that the analysis and description of concepts should be complemented by a more general metaphysical research program, that describes the most fundamental characteristics of the conceptual system of ordinary language.

Wittgenstein's (1922) idea of definition as translation influenced Quine and through him (a.o.) Sellars and Davidson. Quine's (1960) 'radical translation' is translation of concepts without knowing the language to be translated. Radical translation, like first language learning, can only – and therefore, must – be based on observed linguistic behaviour.

Traditionally, concepts are seen as referring to extra-linguistic objects. However, Sellars (1963) explains that the only way to explain a concept is to compare the role of that concept in its language or conceptual framework with another, similar concept in a known language (known to the interpreter). A concept is a linguistic classification that can only be explained in or with the help of other linguistic classifications or sets of categories. All description, explanation, or definition is linguistic. Concepts cannot be described extra-linguistically. Hence, (1) concepts are not learned in isolation, but as part of a language; and (2) CA is translation (Sellars 1963, see also Brown 1986). Sellars disputes 'the myth of the given': there is no intrinsically basic language. Every language can be a 'first language'. As this implies that there are as many possible 'first languages' as there are languages (in general), there can be no absolute translation of concepts.

As concept analysis is translation, not reference, studying concepts or studying conceptual systems (or frameworks or cultures) implies learning a second language (often abbreviated as L2 learning). (Similar ideas have been expressed by (a.o.) Winch (1958) and Gadamer (1960) (see § 2.2.2).) However, L1 (first language) concepts are extremely influential in the interpretation of similar L2 concepts. 'When writing or speaking the target language (L2), second language learners tend to rely on their native language (L1) structures to produce a response' (Bhela 1999, p. 22). A L2-learner learns this language partly in terms of the meanings already learned in L1 (Carroll 1964; Albert & Obler 1978 and Larson-Freeman & Long 1991), and all L2 learners begin by assuming that for every word in L1 there is a single translation equivalent in L2 (Blum-Kulka & Levenston 1983). In L2 practice this is reflected in 'concept mediation', the (empirically confirmed) theory that there are no direct links between L1 and L2, but that L2-speaker think of the word in own language, try to specify its meaning (step 1: concept activation) and then try to find the appropriate word in L2 for this meaning (step 2: word retrieval) (*e.g.* Kroll & Stewart 1994, la Heij *et al.* 1996, de Groot & Poot 1997).

As was Sellars, Davidson was deeply influenced by Quine. He based his theory of 'radical interpretation' (1973) on Quine's 'radical translation'. However, he contended that translation is insufficient to understand a language. Radical interpretation is the interpretation of linguistic behaviour of a speaker without knowing anything about his language, beliefs, meanings, etc. The core problem of radical interpretation is that it is impossible to understand the meaning of utterances, without understanding the speakers language, beliefs, meanings, etc. and *vice versa* (see also Davidson 1967). The only way out of this 'hermeneutic circle' (see § 2.2.2) is to assume that the speaker has the same language, beliefs, meanings, etc. and slowly adapting this assumption to newly learned ideas about the speakers actual same language, beliefs, meanings, etc. until some kind of equilibrium is reached.

Davidson's radical interpretation is more or less contradicted by Jackendoff's (1991) 'conceptual semantics', which asserts that there is a conceptual structure, a form of mental representation, 'that is common to all natural languages and that serves as the 'syntax of thought'' (p. 10) and by Wierzbicka's (*e.g.* Goddard & Wierzbicka 1994; Wierzbicka 1997)

claim that there are approximately 60 *semantic primitives* or *lexical universals* that are common to all languages and to which all concepts can be reduced. Corson (1995), on the other hand, even outpaces Davidson, claiming that languages are so different that meaningful communication is more or less impossible.
To Quine's 'two dogmas', Davidson's added a 'third dogma of empiricism' (1974). This third dogma entails the notion that conceptual and empirical knowledge cannot be distinguished because we cannot distinguish the 'subjective' contribution to knowledge coming from ourselves from the 'objective' contributions coming from the world. Attitudes, beliefs, perceptions, etc. are causally, semantically and epistemically linked to objects and events in the world, which makes is impossible to distinguish these 'objectively'.

By the 1970s, CA was extremely unfashionable in philosophy and linguists were primarily dealing with syntax. CA, however, by this time spread to the social sciences and beyond (see § 2.3). However, the philosophy of language remains one of the most important fields within modern philosophy and some language philosophers still dare to do CA. Very recently, for example, Jackson (1998) defends a modest role for CA:

> Conceptual analysis is not being given a role in determining the fundamental nature of our world; it is rather, being given a central role in determining what to say in less fundamental terms given an account of the world stated in more fundamental terms. (p. 44)

2 / 2 / 2 / concepts and meaning outside analytic philosophy

Language, concepts and meaning have been studied from a variety of perspectives. Within philosophy, analytic philosophy hardly has a monopoly on language and outside philosophy there is a whole scientific field studying language: linguistics. The most basic division of the field of linguistics is that in syntax (or syntactics), semantics and pragmatics. Syntax studies grammar; semantics focuses on meaning; and pragmatics is the study of the (actual) use of language. A further, strongly related field is semiotics, the study of 'signs'. As language is a specific use of specific symbols, linguistics may be considered part of semiotics.
Modern semiotics was founded by Peirce and de Saussure, but was superseded by, for example Plato, who wondered (in *Kratylos*) whether words have a natural or necessary form that is linked to their meaning or are merely conventional signs, and by Aristotle and Augustine. Peirce wanted to study signs and symbols from a philosophical perspective. De Saussure was specifically interested in language as a system of signs. The central problem of semiotics is the question regarding how one thing can mean another, how a sign x can induce a person to think about y. Semiotics is an extremely broad field, as almost anything can be interpreted as a sign. Peirce defined the concept of "sign" in a letter to Lady Welby of December 1908: 'I define a sign as anything which is so determined by something else,

called its Object, and so determines an effect upon a person, which effect I call its Interpretant, that the latter is thereby mediately determined by the former' (in: Ogden & Richards 1923, p. 288).
Of the before mentioned sub-fields of linguistics, semantics, as the study of meaning, is closest to CA. Semantics, however, generally studies the nature of meaning on a deeper level and is not so much concerned with actual (specific) concepts. Semantics is divided into pure, applied and formal semantics. Pure semantics studies artificial (formal) languages, while applied semantics studies sentences and words in natural languages. Formal semantics is a formalized systematic approach in studying and describing the object-language (the language studied). Within semantics a number of competing theories have been developed. Conceptual Role Semantics (often abbreviated as CRS), for example, asserts that the meaning of a concept is the role of that concept in the perception, thought and decision-making-processes of the user of the concept. Possible World Semantics (PWS) assumes that meaning is related to functions from possible worlds to individuals. Situation Semantics claims that concepts and propositions refer to states of affairs.

The most important current, apart from analytic philosophy, that dealt with language is probably hermeneutics. Hermeneutics is a tradition of textual interpretation that started when Protestants had to interpret the Bible themselves (rather than uncritically following a priest). Schleiermacher founded modern hermeneutics in the early 19th century. His goal was to understand a text as well as the author(s) did. One of the core ideas of hermeneutics is the 'hermeneutic circle' (compare Davidson in the preceding subsection). The hermeneutic circle is the phenomenon that to understand part of a text it is necessary to understand the whole and *vice versa*. Dilthey enlarged the original subject of hermeneutics (the Bible) considerably when he set out to study the whole of culture. Other important adherents to hermeneutics include Heidegger and Gadamer. According to Gadamer (1960) all meaning is context-dependent. Understanding is not just a relation between object and (knowing) subject but also between 'horizons', conceptual and cultural frames of reference. As it is impossible to step outside one's horizon, understanding implies the integration of a strange horizon with one's own (compare Davidson in the preceding subsection).
Winch, a student of Wittgenstein, combined (possibly unconsciously) the later Wittgenstein and hermeneutics in a kind of 'analytic hermeneutics'. Winch himself influenced (a.o.) Habermas. In particular Wittgenstein's idea of concepts as rules influenced Winch deeply. The identification of concepts demands the recognition of the regularities of human behaviour and interaction. These regularities are the result of rule-following instead of laws. Rules themselves are laid down in concepts and meanings. 'For Winch the social is the *meaningful* and the meaningful is the *rule-governed*' (Lyas 1999, pp. 28-29). In Winch's opinion (1958; 1964), the core of social science is the determination of the nature of social phenomena, which is (also) the terrain of philosophy. Studying social phenomena, studying other cultures especially, implies studying the meaning of these phenomena within those cultures, studying the concepts constituting that culture. 'Instead of viewing concepts as

theories which explain actions, Winch asks us to treat them as constituting the terms within which people carry on their lives. (…) understanding a way of life and understanding a set of concepts are one and the same thing' (Sharrock & Anderson 1985, p. 121). Or in the words of Winch himself:

> What we may learn by studying other cultures are not merely possibilities of different ways of doing things, other techniques. More importantly we may learn different possibilities of making sense of human life, different ideas about the possible importance that the carrying out of certain activities may take on for a man, trying to contemplate the sense of his life as a whole. (Winch 1964, p. 321)

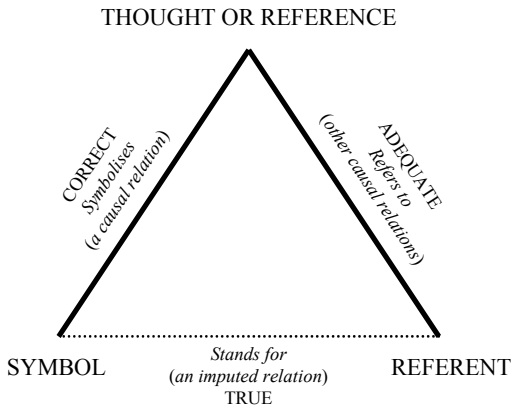
Winch (1964) distinguishes a small number of basic problems or 'limiting concepts' which every society has to deal with.

> I have wanted to indicate that forms of these limiting concepts will necessarily be an important feature of any human society and that conceptions of good and evil in human life will necessarily be connected with such concepts. In any attempt to understand the life of another society, therefore, an investigation of the forms taken by such concepts – their role in the life of the society – must always take a central place and provide a basis on which understanding may be built. (p. 324)

Almost a century before Winch, a completely different philosophical current dealt with concepts and meaning as well. Peirce, one of the before mentioned founders of semiotics, was also the founding father of the philosophical movement of pragmatism. The pragmatist James (*e.g.* 1907) took as his starting point the idea that it is impossible to determine the nature of philosophical and psychological terms. It is not very useful to try to define concepts such as "truth" or "consciousness", rather we should show how these concepts are actually used. This is the essence of pragmatism. Its goal is to clean up the philosophical vocabulary. Peirce himself corresponded from 1903 onwards with Lady Welby, who introduced *significs*. Welby introduced Richards and Ogden to Peirce's work, which resulted in their book *The meaning of meaning* (1923), which was most influential half a century later in CA in social and political science (see § 2.3). Ogden later translated Wittgenstein, and Welby also corresponded with Russell, which illustrates an interesting web connecting (ultimately) almost everyone mentioned in this chapter.
Significs was intended as the scientific study of acts of communication. Welby's main goal seemed to have been the improvement of communication by ending misunderstandings. The starting point for the movement of significs was Welby's trichotomy: sense, meaning, significance (*e.g.* Welby 1896). *Sense* is the initial, unanalysed, effect of a sign on the mind; *meaning* is the effect in the mind of the interpreter intended by the producer of the sign; and *significance* is the full effect a sign possibly would have in any mind. Based on this trichotomy and strongly related to Frege's distinction of *Sense* and *Bedeutung* (see

above), Ogden and Richards (1923) proposed a trichotomy of symbol, thought and referent (see figure 2.1). (Sowa (2000, p. 192), however, claims that Aristotle (in *on Interpretation*) was the first to make this distinction.) Thought and symbol are causally related, as are thought and referent, Ogden and Richards claimed. But, 'between the symbol and the referent there is no relevant relation other than the indirect one' (p. 11).
As mentioned above, Ogden & Richards would have considerable influence half a century later, but significs did not end with them. The movement of significs gained some strength in the Netherlands, where it gave birth to Signific Concept Analysis (SCA). Its most important Dutch followers were mathematician Brouwer, Mannoury and the methodologist de Groot. However, with a notable exception of de Groot's work in SCA, significs was dead by the 1960s (*e.g.* Schmitz 1991).

figure 2.1: *Ogden & Richard's meaning triangle*



(figure adapted from Ogden & Richards 1923, p. 11)

While Welby despised definitions, SCA is based on definition. The term "Signific Concept Analysis" was coined by Mannoury (Visser 1999), but its theoretical content was mainly the product of de Groot (*e.g.* de Groot & Medendorp 1986; 1988). De Groot and Medendorp specified eight rules for SCA. The first states that only nouns (or nominalisible verbs or adjectives) can be subjects of SCA; the fourth demands consultation of dictionaries and specific (for that concept) conceptual analyses already published; the fifth advises dealing with the historical or etymological roots of words; the seventh warns about metaphors; and the eighth advises consideration of the relevance of context. In explaining these rules, de Groot and Medendorp state that 'The attainment of the ultimate goal – consensus of experts of different orientations – is furthered best by designing primarily a mantle definition in which particular conceptions can be encompassed as special cases' (1988, p. 261).

Besides hermeneutics, pragmatics and significs, there have been some more or less isolated figures in the recent history of philosophy who dealt in some way with CA. Most them had very little (or maybe even none whatsoever) influence on the main currents of CA and philosophy of language. Fries and Nelson, for example, practised a kind of CA in a Kantian tradition (*e.g.* Yolton 1961). Fries and Nelson believed that 'concept analysis' is more than just lexicography or specifying definitions because (1) it uncovers implicit or hidden presuppositions and meanings (which may differ from the intended meaning); and (2) it does not analyse meaning, but (an ideal) meaning is offered through analysis. Lovejoy and Foucault were more interested in the historical context of concepts (see also § 2.4.1). Lovejoy (1948) regarded himself some kind of physician of philosophy. He set out to reduce ideologies, systems, and -isms to their fundamental particles. Foucault (*e.g.* 1966) most strongly emphasised the historical context of concepts. Based on (a.o.) Foucault, *A*. Davidson (not *D*. Davidson dealt with above) claims that the nature of (some) philosophical problems is determined by the historical conditions of their genesis. 'We will not fully understand the concepts used in the dialectic of philosophical argumentation unless we practice a certain form of historical analysis' (Davidson 1984, p. 107).

2 / 2 / 3 / meaning, definition and reference

The preceding subsections briefly reviewed the historical development of types and variants of conceptual analysis. The focus was more on the development and currents than on the concepts, theories and techniques of CA, however. This subsection is intended to fill the gap and deals with notions such as "meaning", "definition", and "reference".

Meaning is probably central to CA. However, the concept and nature of "meaning", like the concept of "concept" itself (see § 2.1.2) is highly contested. Several competing theories of meaning exist. Meaning as truth is the theory of meaning of classical analytic philosophy. The basic idea, introduced by Frege (1884), is that the meaning of a declarative sentence can be given by specifying its truth-conditions. A serious drawback is that there are infinitely many truth-conditions: "p" is true if at least p is the case, but also if $p \wedge q$ is the case, whatever is q. Grice (1957) contended that meaning is intention. The meaning of an utterance is the intention of the utterer. According to Wittgenstein the meaning of a concept is the rule for its use. Dummett and Davidson claim that meaning is understanding. And the verification theory of meaning asserts that meaning is proof.

Next to theories about what concepts mean, there are theories about what concepts refer to. Possible candidates are extensions (*e.g.* Goodman 1951/66; Quine 1960); intensions (*e.g.* Montague 1974); a combination thereof (*e.g.* Carnap 1946); and common properties (*e.g.* Dretske 1981, Millikan 1984, Fodor 1990). The extension - intension dichotomy is related to Frege's *Sinn* and *Bedeutung* and to Ogden and Richards symbol and referent, but these distinctions are far from identical. The extension of a concept is the set of instantiations of that concept, the set of 'things' to which the concept applies. Formally, an intension is a

function that maps a possible world to the extension of the concept in that world. Intensions are often interpreted as sets of properties a 'thing' must have to belong to the extension of that concept (*e.g.* Sartori 1984b), hence, to be an instantiation of that concept. In this interpretation, the before mentioned second and fourth candidate for reference coincide.
According to Quine (1951), there are no intensions. Intensions are nothing but psychological entities intervening between language and reference. There is no place for intensions in a purely scientific or logical approach to meaning and semantics. Quine's position is rather problematic when non-extensional concepts are concerned, although Quine would probably not allow non-extensional abstract concepts in scientific language. That, however, would make (social) science (as we know it) impossible as the social and political sciences are packed with non-extensional concepts (*e.g.* Sartori 1984b; Gerstlé 1989). Concepts such as "culture", "society" or "democracy" have no extensions. Dutch culture is not a member of the extension of "culture" but of the different concept of "a culture". And: 'a culture is no mere subset of culture, but a different order of abstraction entirely' (Bohannan 1973, p. 358). Similarly, American democracy (if existing) is not a member of the extension of "democracy", but of "a democracy". The concepts "culture" and "democracy" do not refer to actual cultural groups or democratic states, but to bodies of ideas and theories. Claiming that Dutch culture and American democracy are members of the extensions of "culture" and "democracy" respectively is very much like claiming that five centimetres is a member of the extension of "length". The relationship between Dutch culture and "culture" is more or less like that between five centimetres and "length": the first is a specific value of the latter, not an instantiation. (On quantitative concepts see also Hempel 1952.)

Ideas about concepts, meaning and reference are integrated in a number of theories. Laurence and Margolis (1999) distinguish five of these theories, but more can be distinguished.
The Classical Theory of Concepts (CTC) was probably first introduced by Locke (1690). It holds that concepts are 'structured mental representations that encode a set of necessary and sufficient conditions for their application, if possible, in sensory or perceptual terms' (Laurence & Margolis 1999, p. 10). Complex concepts can be analysed into less complex concepts and finally be reduced to sensory data and logic. CTC presupposes that our 'intuitive categorization judgments will correspond precisely with simple clusters of properties' (Ramsey 1992, p. 61) and that 'we have tacit knowledge of the 'essence' of abstract concepts, that the essence is a small set of necessary and sufficient conditions, and that we can uncover this knowledge by appealing to our intuitive categorization judgments' (Ramsey 1992, p. 62).
Several objections to CTC have been put forward. First of all, there are hardly any uncontroversial definitions. 'Definitions have proven exceptionally difficult to come by, especially if they have to be couched in perceptual or sensory terms in accordance with empiricist strictures' (Laurence & Margolis 1999, p. 14). Other objections are related to the

problem of analyticity (see § 2.2.1), conceptual fuzziness, and the fact that we can have and use concepts without being able to specify their definitions.

The Neo-classical Theory of Concepts (NTC) assumes that concepts have partial definitions only. The partial definitions specify the necessary (but not sufficient) conditions for their application. 'Concepts may have a definition after all, or at least a partial definition; it's just that the definition involves tacit rules that are extremely difficult to articulate' (Laurence & Margolis 1999, p. 54).

The first real alternative to CTC was the Prototype Theory of Concepts (PTC). PTC was based on Wittgenstein's (1953) notion of family resemblances (*e.g.* Medin & Smith 1985). He developed this idea in trying to explain the meaning of the concept of 'game'. According to Wittgenstein 'der Begriff "Spiel" ist ein Begriff mit verschommenen Rändern' (§ 71). Instantiations of a family resemblance have some properties of a set of prototypical properties, but not necessarily all of them. PTC is affirmed by Millikan's (1998) conclusion that extensions of concepts are not determined by their description, but that small children develop concepts as referents pointing at unique natural objects. Moreover, PTC underwent extensive empirical testing. Rosch (1973) and Smith and Medin (1981) found that people need more time to think about the appropriateness of a concept, for classification of an object, for cases that are further away from the prototype. Rosch (1973) and Rosch and Mervis (1975) found that people are able to rank cases in order of typicality regarding the appropriateness of specific concept. Barsalou (1987), however, found that these 'typicality rankings' are significantly different between different people and change over time rather quickly (sometimes even within a single month).

PTC does not solve all the problems related to CTC. It is, moreover, not very useful for theories of CA: 'The fact that people are quicker to say that robins rather than penguins are birds may tell us something about people's representations of [bird], but nothing about the definition of the concept [bird] itself, that is, what is in fact required to satisfy that concept (…)' (Rey 1998, p. 513). (see also Ramsey 1992)

From the empirical research in PTC, the Exemplar Theory (ETC) developed. Unlike PTC that claims that concepts refer to single prototypes, ETC assumes that concepts refer to all known cases.

A number of mixed theories, Dual Theories of Concepts (DTCs), have been proposed. Some are combinations of CTC and PTC, others combine other theories (such as PTC and the Theory Theory of Concepts (TTC); see below). An example of a DTC as a combination of CTC and PTC can be found in the work of Pinker and Prince (1999), who found that prototype and classical models of concepts are complementary. They concluded this after researching English verbs. What they found was that regular verbs are classical, while irregular verbs are prototype concepts.

The Theory Theory of Concepts (TTC) assumes that 'a concept's identity is assumed by its role within a theory' (Laurence & Margolis 1999, p. 45) and that the meaning of a concept (or scientific term) is dependent on the successive theories in which it is used (*e.g.* Bartels 1994). The idea is related to Quine's (1951) 'confirmation holism' and to Popper's (1935)

and Wittgenstein's (1953) idea of the 'theory-ladenness' of concepts. Concepts are regarded as theoretical terms and changes in concepts are interpreted as and compared to changes in theories. Like all the other theories above (and the one below), TTC does not explain how people are able to have and use a concept without being able to define it. Another problem is that people with completely different convictions and worldviews still may share some (or even many) concepts, which would be impossible (or extremely unlikely at least) if concepts derive their meaning from the broader framework they are part of.
Conceptual Atomism (ATC), finally, assumes that concepts are primitive. It seems, however, rather absurd to assume that the concept of "disk drive" is innate. Moreover, if concepts are innate, many of the psychological effects described above cannot be explained.

Besides the rather theoretical or philosophical questions regarding meaning, reference and the concept of "concept", philosophers dealt with the concept and idea of "definition". The idea of "definition" itself is strongly related to CTC (see above). Definitions are explanations of the meaning of a word. Several types of definitions can be distinguished: (1) a stipulative definition is a proposal about the use of a word (a stipulative definition, therefore, cannot be wrong, but it can be unpractical); (2) a lexical definition is a report on the actual use of the word in a specific group; (3) a precising definition is an attempt to reduce vagueness; (4) a theoretical definition is a proposal about the understanding of the meaning of a word in a specific theoretical context; (5) a persuasive definition is an effort to influence attitudes by attaching emotive contents to the meaning of a word; (6) an operational definition is a mix of a stipulative and a theoretical definition in the context of a specific scientific problem; (7) a contextual definition is a definition of a concept by its function in a specific context (it is, for example, rather difficult to define "the" otherwise than contextually; *e.g.* Whitehead & Russell 1910-3).
Philosophers disagree about what it means to define. Whitehead and Russell (1910-3) regarded definitions as 'mere typographical conventions' (p. 11). Nevertheless Whitehead and Russell did not think definitions are trivial. Definitions (1) show that the defined concept is important within a specific theoretical framework; and (2) can be used to analyse previously unclear concepts. To Carnap (1947) definitions are rational reconstructions of imprecise concepts; definitions are used to explain and clarify. Quine (1951), on the other hand, claims that definition is based on synonymy rather than explication. Etymologically, "to define" means "to delimit". 'Thus definitions serve to fix boundaries' (Suppe 2000, p. 76). Although philosophers disagree on what exactly it means to define, most of them agree that defining is notoriously difficult. Bohnert (1963), for example, writes that 'we must not assume that just because we use a word successfully we have some neat, fixed mental something that corresponds to it and that we merely need to sit down and analyze to arrive at a full definition' (p. 430).
Different philosophers specify different criteria for definitions, sometimes depending on the context. Ramsey (1992), for example, contends that definitions in CA should be relatively

simple and must not admit intuitive counterexamples. Generally it is required for definitions that the *definiendum* (what has to be defined) has (exactly) the same meaning as the *definiens* (the equivalent of the definiendum supplied in the definition; the text of the definition). Carnap (1947) disagrees: 'some sort of correspondence between the two concepts, in such a way that the latter can be used instead of the former' (p. 8) is sufficient.
What most philosophers agree about is that definitions should be non-informative. That is, definitions may not give new information (*e.g.* Whitehead & Russell 1910-3). Definitions must satisfy two criteria: (1) eliminability and (2) non-creativity (Leśniewski 1931; Suppes 1957). These criteria demand that new symbols or meanings introduced by definitions do not result in new theories and can be eliminated without any theoretical consequences. (Formal definitions of eliminability and non-creativity are specified in box 2.1 at the end of this subsection.)
An additional criterion for (useful) definitions can be derived from Quine's (1968) 'ontological relativity':

> What makes ontological questions meaningless when taken absolutely is not universality, but circularity. A question of the form 'What is an F?' can be answered only by recourse to a further term: 'An F is a G'. The answer makes only relative sense: sense relative to an uncritical acceptance of 'G'. (p. 204)

In other words, and applied to definitions, a definition is meaningless if its definiens uses terms that are as vague or ambiguous as the definiendum.

Sometimes definitional analysis is confused with logical implication. Carnap (1946; 1947; see also Linsky 1949) used the concept of "intensional isomorphy" (or "intensional isomorphism") to explain the difference. He claimed that the statement $A=_{def.}B$ (definitional identity of predicates) is not intensionally isomorphic to $\forall x[Ax\leftrightarrow Bx]$. Statements are intensionally isomorphic iff the relations between and the intensions of the concepts in both statements are the same. This is not the case here due to the fact that the syntactic structure of both statements differs and there is, for example, no x in the first statement. The relationship between the definitional analysis "$A=_{def.}B$" and the logical biconditional "$\forall x[Ax\leftrightarrow Bx]$" is not a relationship of identity; it is a conditional of the following form:

T2.1 $(A =_{def.} B) \rightarrow \forall x\,[Ax \leftrightarrow Bx]$.

Note that the relationship is a conditional. Why it is not a *bi*conditional, is easily illustrated with an example. Let A mean "equilateral triangle" and B mean "equiangular triangle". We now have a situation wherein $\forall x[Ax\leftrightarrow Bx]$ is true (in Euclidean space) while $A=_{def.}B$ is not. The relationship, however, *is* a biconditional if *necessarily* (symbolised by $\Box$) $\forall x[Ax\leftrightarrow Bx]$:

T2.2 $(A =_{def.} B) \leftrightarrow \forall x \, \Box[Ax \leftrightarrow Bx]$,

provided that necessity is interpreted as "in all possible worlds". As there are non-Euclidean spaces conceivable in which an equiangular triangle is not equilateral (or the other way around) both $A=_{def.}B$ and $\forall x\Box[Ax\leftrightarrow Bx]$ are false.

box 2.1: *formal definitions of eliminability and non-creativity*

There is a theory **T** and a definition **D** containing a new symbol ("new" here meaning "not yet in **T** "). Then:

definition **D** satisfies the principle of eliminability iff:

$\forall p \, [\, (\mathbf{T} \vdash p \wedge \mathit{consym}(\mathbf{D},p) \rightarrow \exists q \, [\, \mathbf{T} \vdash q \wedge \neg \mathit{consym}(\mathbf{D},q) \wedge (\mathbf{T} \cup \mathbf{D}) \vdash (p \leftrightarrow q) \,] \,]$,

in which p and q are propositions and "consym(**D**,p)" means "p contains the new symbol used in **D** ". And similarly:

definition **D** satisfies the principle of non-creativity iff:

$\forall p \, [\, (\, \neg \mathit{consym}(\mathbf{D},p) \wedge \mathbf{T} \vdash (\mathbf{D} \rightarrow p) \,) \rightarrow \mathbf{T} \vdash p \,]$.

2 / 2 / 4 / summary and conclusions

Conceptual analysis (CA) in philosophy is over two millennia old. Nevertheless, its main theoretical development, its blossoming and its going out of fashion all took place in the 20th century. Starting with Moore, analytic philosophers claimed that philosophical (and many scientific) problems are the consequences of how we use language. Philosophy, therefore, should analyse language primarily. The initial ('classical') approaches to concepts and CA in analytic philosophy were, in following decades, refuted by psychological research (§ 2.2.3) and philosophical analysis itself (§ 2.2.1). Philosophers and linguists became increasingly aware of the complexities of concepts and conceptual analysis. During the 20th century, analytic philosophy was not the only field interested in concepts and CA. Several other disciplines and philosophical currents dealt with concepts and meaning, including semiotics and semantics, heuristics, and significs (§ 2.2.2).
One of the most basic ideas that seems to be present in all (or most, at least) of the theories and philosophies described above – although the terms or labels used vary among philosophers and theories – is that concepts $\mathcal{C}$ are associated to triplets of term $\mathcal{T}$, meaning $\mathcal{M}$ and referent $\mathcal{R}$: $\langle \mathcal{T},\mathcal{M},\mathcal{R} \rangle$. One could, however, argue that the referent itself is not part of the concept, and that a concept *is* an ordered couple of term $\mathcal{T}$ and meaning $\mathcal{M}$ and *has* a referent $\mathcal{R}$, which could result in a first definition of concepts:

D2.1* $\mathcal{C} =_{\text{def.}} \langle \mathcal{T}, \mathcal{M} \rangle$.

This definition will be the starting point for an attempt to construct a general model of concepts based on the literature reviewed in this chapter and intended to provide a theoretical foundation for a methodology of conceptual analysis in social science. Section 2.7 presents this model and the associated methodology.

Of the two elements of D2.1*, only meaning $\mathcal{M}$ seems to be problematic. Especially subsection 2.2.3 dealt with different theories about meaning and how to determine it. As meaning, in many theories, is the intermediate between term $\mathcal{T}$ and referent $\mathcal{R}$, theories about reference codetermine theories of meaning and vice versa. A number of theories on concepts, meaning and reference were described in subsection 2.2.3. The most important were the classical theory (CTC) and the prototype theory (PTC). The first assumes that concepts can be neatly defined by a (relatively small) set of necessary and sufficient conditions. In practice this, however, has proven to be very difficult. The prototype theory, on the other hand, claims that only partial definitions are possible and that these partial definitions refer to sets of necessary conditions, of which only a subset must be fulfilled for the correct application of the concept. Both CTC and PTC and the other concept theories mentioned, however, come with a number of other theoretical problems yet unsolved. Nevertheless, whatever concept theory chosen, D2.1* still holds. It is only in determining the nature of $\mathcal{M}$ that these theories matter (see § 2.7.1).

A number of philosophers, including, for example, Wittgenstein, Winch and Gadamer, pointed at the importance of the (linguistic) context of concepts. According to Wittgenstein the meaning of a concept is the rule for its use within a language-game. Gadamer asserted that the meaning of concepts as parts of text is determined by the linguistic context, the conceptual framework, of the author. Hence, besides to referents $\mathcal{R}$, concepts are also somehow related to linguistic context $\mathcal{O}$ (language-game, conceptual framework, etc.).

Slowly, the picture becomes more complicated. Most of the theories dealt with in this subsection, however, have something in common: they are based on a very abstract concept of "concept" and deal only with relatively simple concepts, such as natural kinds. Nevertheless, even these seem to defy analysis or definition.

> Arguably, the world does not supply determinate answers: all kinds in the world may have vague boundaries, any precise delimitation of which may depend on human decision. But this does not imply that all applications of concepts are up to human decision, much less that there are no defining essences of the phenomena they pick out. (Rey 1998, p. 508)

The following sections deal with gradually increasingly more complex concepts. Section 2.3 and 2.4 focus (a.o.) on scientific and political concepts. Section 2.5 and 2.6 deal with concepts in context.

2 / 3 / applied conceptual analysis

Concept theories and conceptual analysis (CA) in philosophy and psychology almost exclusively deal with relatively simple ordinary language concepts. The concepts that most need analysis in most scientific fields, however, are very complex and in many other respects very different from ordinary language concepts. Scientific terminology is a kind of *semi-formal language* to which the theories of ordinary language do not necessarily apply. Wittgenstein's (1953) notion of meaning as use, for example, is discarded by Sartori (1984b) on the grounds that the meaning of scientific terms and concepts is not determined by their actual use, but by what the concept was intended to mean at its introduction. Similarly, Sartori (1984a) puts aside Quine's (1951) suggestion that the unit of empirical significance is a theory (or even science) as a whole, as 'outrageously unhelpful advice' (p. 9).
Since the 1970s, forms and variants of CA have been applied in a number of fields. The application in different fields can be nicely illustrated by classifying all articles published in international scientific journals in the period 1980 - 2003 (and registered in the Online Contents database; see www.oclcpica.org), having in their title one of the following phrases: "conceptual analysis", "concept analysis" or "analysis of the concept", by scientific field. (An alternative, more theoretical oriented, and not quantified, classification can be found in Pathak 2000; see also §2.1.2.) The results of this classification are represented in table 2.1:

table 2.1: *percentage of articles on / in conceptual analysis by scientific field*

philosophy and (philosophical) linguistics	5.5 %	
nursing and medicine	37.1 %	
↳ *nursing*		*35.0 %*
↳ *medicine*		*2.1 %*
social, political and behavioural sciences	24.8 %	
↳ *political science*		*7.1 %*
↳ *social sciences*		*7.9 %*
↳ *psychology*		*9.8 %*
computer and information science	18.3 %	
↳ *Formal Concept Analysis (FCA)*		*11.0 %*
↳ *other / unspecified*		*7.3 %*
education	7.7 %	
natural sciences	3.5 %	
arts	3.2 %	
total	100 %	

The table shows that the bulk of articles on or in CA came from a relatively small number of fields. Nursing is by far the most active field in CA. When only articles applying CA to

specific concepts are counted, the share of nursing even rises to 47%. Interestingly, CA in nursing and education share a common background in the work of Wilson (1963). CA in nursing will be dealt with in subsection 2.3.2 (the relatively small field of CA in education is ignored here; see Frein 1998 for an overview). In the 1970s concern about the rather ambiguous terms and concepts in the social and political sciences grew. This resulted in (a.o.) a Unesco report (Riggs 1981) and a number of related research projects on terminology, international classification, knowledge organisation, and concepts in the social and political sciences themselves. Subsection 2.3.1 gives a brief overview of CA in these fields. The third 'major player' in CA is computer and information science. Most of the articles on CA published in this field are about Formal Concept Analysis (FCA), a mathematical technique used to map *conceptual structures*. FCA and most of the remainder of CA in computer and information science is related to fields such as knowledge representation and artificial intelligence. The goal of these types of CA, if that is what they are, usually is the summary and representation of a set of concepts and related knowledge in a specific field in a rigorous and formal structure. As these techniques do not focus on single concepts but on conceptual structures, they are dealt with in subsection 2.6.2. However, some publications from these and other fields do also deal with single concepts and present formal methods of CA. Subsection 2.3.3 deals with the most important formal tools suggested to be applicable in CA.
CA in other fields is relatively rare and will be mostly ignored here. An example of CA in the arts is Galle's (1999) analysis of 'design as intentional action'. CA in the natural sciences is often related to taxonomy or classification of natural objects (such as (the boundary between) hills and mountains; *e.g.* Smith & Mark 1999; Varzi 2001).

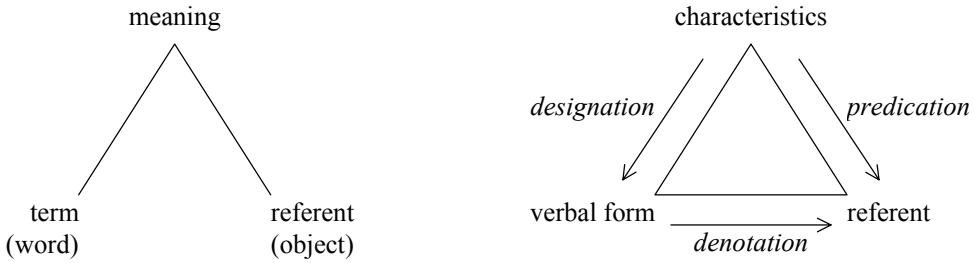
2 / 3 / 1 / terminology and CA in social and political science

CA and terminology research in social and political science arose in the 1970s as a reaction to the increasing conceptual confusion caused by the continuous introduction of new terms and new meanings for existing terms. As Dahlberg (1978) puts it: 'the almost exclusive reliance by social scientists on the use of terms derived from ordinary language usages results in an extreme proliferation of the meanings in which the most commonly used words are employed, thus producing a polysemantic jumble which appears to defy all normalizing efforts' (p. 142). Hence, 'concept reconstruction is a highly needed therapy for the current state of chaos of most social sciences' (Sartori 1984b, p. 50).
In 1970 Riggs and Sartori founded the Committee on Conceptual and Terminological Analysis (COCTA), which is a part of both the International Political Science Association (IPSA) and the International Sociological Association (ISA). Discussions within COCTA resulted (a.o.) in the before mentioned Unesco report: *Interconcept report* (Riggs 1981) and in S*ocial science concepts: a systematic analysis*, edited by Sartori (1984). Besides Cocta and Interconcept / Unesco, the International Standards Organisation, Technical Committee

No. 37 (ISO/TC37) had been working since the end of the 1960s on a number of standards in terminology research. These are ISO 860, a proposed methodology for dealing with differences and development of concepts and terms, published first in 1968; ISO 704 on the establishment of conceptual systems, published first in 1987; ISO 1087, which applies ISO 704 to its own field, hence, presents an official vocabulary for terminology research, published first in 1990; and ISO 10241 on international terminological standards, published first in 1992. (For an overview of the history and contents of these standards see Effenberger 1995.)
The *Interconcept* project was started by Unesco in 1977 as an answer to a perceived 'fundamental need' for the social sciences: a 'term bank'. *Interconcept* (Riggs 1981) specifies guidelines for creating glossaries rather than for CA of individual terms. *Interconcept* glossaries have to satisfy a number of criteria. Its introduction, for example and not very surprisingly, should state the logic and method used, if different from the before mentioned ISO standards. The main text of an *Interconcept* glossary consists of 'records'. A record provides information about a concept, mainly about its notation and definition.

Terminology research and CA in social and political science are heavily influenced by Ogden and Richard's *the meaning of meaning* (1923) (see § 2.2.2). Ogden and Richard's meaning triangle of symbol, thought and referent (figure 2.1) was transformed by Sartori (1984b, p. 23) into figure 2.2 (left), which Sartori regarded the most usable starting point for CA.

figure 2.2: *Sartori's (left) and Dahlberg's (right) meaning triangle*



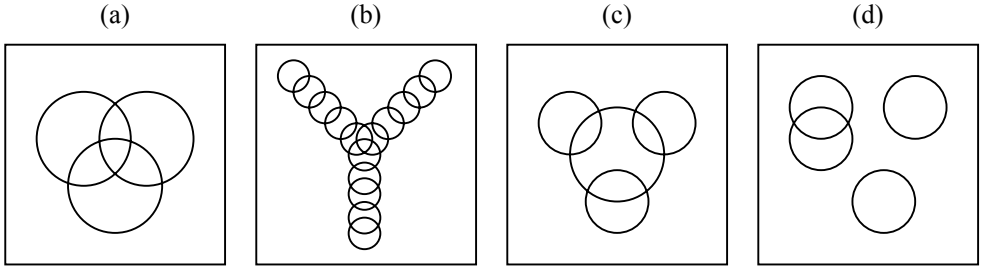
(figures adapted from Sartori 1984b, p. 23 and Dahlberg 1978, p. 144)

This figure suggested to Sartori his two basic questions: (1) how do meanings relate to words and (2) how do meanings relate to referents. To Sartori, meaning, intension or connotation of a term or concept 'consists of all the characteristics or properties of that term' and 'referents are the real-world counterparts (if existent) of the world in our head' (p. 24). Like Ogden and Richards, Sartori did not recognise a direct link between term and referent. However, Sartori's triangle was further developed by (a.o.) Dahlberg (1978), who did

include a direct link between term (verbal form) and referent (see figure 2.2 – right), and was formalised by Kuznetsov (1999).

Sartori (1984b) distinguished a number of problems in CA in social and political science. The most important are (1) vagueness, fuzziness and ambiguity; (2) homonyms and synonyms; and (3) opacity, the phenomenon that some social science terms are non-extensional (see also Gerstlé 1989 and § 2.2.3). Sartori illustrates some of these problems in a number of Venn-Euler diagrams, here presented in figure 2.3:

figure 2.3: *definitions as intensional Venn-Euler diagrams*



(figure adapted from Sartori 1984b, p. 47)

In these figures, the circles represent sets of characteristics of (all) known cases to which the term of concept is applied. In cases a and b, there is a common centre, although in b not all cases overlap with this common centre. It is not very difficult to come up with a definition in case a, but this becomes more difficult in case b. Cases c and d are far more complicated. There is no common centre whatsoever in cases c and d, but at least in c there is some overlap, enabling some kind of prototype-definition. Definition in case d is completely impossible (except when you allow disjunctive definitions). In case d it probably is better to speak of different concepts with the same term or label. Hence d is a case of homonymy.
To deal with the difficulties regarding CA in social and political science, Sartori (1948b) suggested a number of rules that became more or less paradigmatic:

> Rule **1**: Of any empirical concept always, and separately check (1) whether it is *ambiguous*, that is, how the meaning relates to the term; and (2) whether it is *vague*, that is, how the meaning relates to the referent. (p. 28/63)
>
> Rule **2a**: Always check (1) whether the key terms (the designator of the concept and the entailed terms) are defined; (2) whether the meaning declared by their definition is unambiguous; and (3) whether the declared meaning remains, throughout the argument, unchanged (i.e., consistent). (p. 36/63)

Rule **2b**: Always check whether the key terms are used univocally and consistently in the declared meaning. (p. 36/63)

Rule **3a**: Awaiting contrary proof, no word should be used as a synonym for another word. (p. 39/63)

Rule **3b**: With respect to stipulating synonymies, the burden of proof is reversed: What requires demonstration is that by attributing different meanings to different words we create a distinction of no consequence. (p. 39/64)

Rule **4**: In reconstructing a concept, first collect a representative set of definitions; second, extract their characteristics; and third, construct matrixes that organize such characteristics meaningfully. (p. 41/64)

Rule **5**: With respect to the extension of a concept, always assess (1) its degree of boundlessness, and (2) its degree of denotative discrimination vis-à-vis its membership. (p. 43/64)

Rule **6**: The boundlessness of a concept is remedied by increasing the number of its properties; and its discriminating adequacy is improved as additional properties are entered. (p. 43/64)

Rule **7**: The connotation and the denotation of a concept are inversely related. (44/64)

Rule **8**: In selecting the term that designates the concept, always relate to and control with the semantic field (to which the term belongs) – that is, the set of associated, neighboring words. (p. 52/64)

Rule **9**: If the term that designates the concept unsettles the semantic field (to which the term belongs), then justify your selection by showing that (1) no field meaning is lost, and that (2) ambiguity is not increased by being transferred into the rest of the field set. (p. 53/64)

Rule **10**: Make sure that the definiens of a concept is adequate and parsimonious: adequate in that it contains enough characteristics to identify the referents and their boundaries; parsimonious in that no accompanying property is included among the necessary, defining properties. (p. 56/64)

2 / 3 / 2 / CA in nursing

It may come as a surprise that nursing is most prolific in CA. This may, however, be related to the importance of (a.o. diagnostic) concepts and communication of these concepts in nursing. In the transference of information on the condition of patients, it is essential that those taking part in communication have the same, or at least similar (definitions of) concepts.

CA in nursing is firmly based on Wilson (1963). Wilson was a philosopher of education, who was strongly influenced by analytic philosophy, especially by ordinary language philosophy. Morse (1995) distinguishes four CA methodologies in nursing and adds a fifth based on Bolton (1977). Hers is the only explicitly non-Wilsonian method. The paradigmatic CA methodologies in nursing, however, are Walker and Avant's (1983) and Rodgers's (1993) evolutionary adaptation thereof. Walker and Avant summarise Wilson's eleven-step method of CA in eight steps:

1. Select a concept.
2. Determine the aims or purposes of analysis.
3. Identify all uses of the concept that you can discover.
4. Determine the defining attributes.
5. Construct a model case.
6. Construct borderline, related, contrary, invented, and illegitimate cases.
7. Identify antecedents and consequences.
8. Define empirical referents. (p. 39)

The goal of Walker-and-Avant-style CA is a prototypical model case. Rodgers (1993) suggested an evolutionary approach of concept development that also deals to some extent with context. Its goal, however, is the same: a prototypical model case. Morse (1995) argues that these Wilsonian methods are based on too simple concept theories. CAs of nursing concepts based on either Walker and Avant (1983) or on Rodgers (1993) pay insufficient attention to conceptual complexity and context, which results in obvious results and little practical value. Morse suggests a three-step method of concept development: (1) identification of attributes (based on an exemplar); (2) verification of attributes (with the help of Bolton's (1977) 'rules of relation'); and (3) identification of instantiations of the concept.
Although a number of nursing scientists criticised the Wilsonian approaches (*e.g.* Wuest 1994; Morse 1995; Hupcey *et al.* 1996; Morse *et al.* 1996), a quick glance over the methods used in recent CA applications in nursing, still shows that Walker and Avant (1983) and, to a lesser extent, Rodgers (1993) dominate the field.

2 / 3 / 3 / formal methods of / in CA

Formal methods of CA (in a very broad sense) have been developed in early 20th century philosophy and are still being developed in sub-fields of Artificial Intelligence and computer science, such as knowledge engineering and conceptual modelling. The most important tools are variants or adaptations of symbolic logic, especially *first-order logic* (FOL). Symbolic logic and set-theory (which is basically FOL plus the $\in$-symbol) are among the oldest tools of conceptual analysis. Mathematical concepts were analysed logically by Frege (1884) and Whitehead and Russell (1910-3). More recently, *formal ontology* (*e.g.* Smith & Künne (eds.) 1982; Smith & Mulligan 1983), which was inspired by Husserl (1900-1), and analytical metaphysics (*e.g.* Bunge 1977) have applied symbolic logic (FOL mainly) in conceptual elucidation.
Conceptual Graphs (CG) were introduced by Sowa (1984) as an alternative system of logic based on the existential graphs of Peirce (1909/33). (For a relatively short introduction, see Sowa 1992; on the relationship between CG and FOL see *e.g.* Wermelinger 1995; Amati & Ounis 2000.) CG is intended to elucidate conceptual structures: sets of interrelated

concepts. The purpose of CG 'is to express meaning in a form that is logically precise, humanly readable, and computationally tractable' (Sowa 1992, p. 3). However, CG is also applicable in definitional analysis. A third formalisation technique in CA is *description logic* (DL) (*e.g.* Brachman & Levesque 1984; Donini *et al.* 1991; Bettini 1997).
To illustrate (the differences between) CG, FOL and DL, consider the following example: a garden can be defined (incompletely!) as a cultivated parcel of land. This can be formalised in FOL, CG and DL as:

D2.2$_{\text{FOL}}$ $\forall x\,[\,\textit{garden}(x) \leftrightarrow (\,\textit{parcel-of-land}(x) \wedge \textit{cultivated}(x)\,)\,]$

D2.2$_{\text{CG}}$ $(\lambda x)\,[\text{GARDEN: } x] = [\text{CULTIVATED}] \leftarrow (\text{STAT}) \leftarrow [\text{PARCEL-OF-LAND: } x]$

D2.2$_{\text{DL}}$ garden $:=$ parcel-of-land $\sqcap\ \exists$ state**.**cultivated

The main difference between CG and DL, on the one hand, and FOL, on the other, is that in FOL every predicate has to refer directly to the logical object x. In other words: the FOL formalisation can be read as: 'every x is a garden if and only if x is a parcel of land *and* x is cultivated'. The CG and DL formalisations makes it possible to describe states (STAT / state) of predicated objects and can be read as 'x is of the type (or x is a) 'garden' if x is a parcel of land that is in the state of cultivation'. In a way CG and DL allow predicates to be further predicated, which is impossible in FOL. Contrary to FOL, CG and DL also allow quantitative qualification of predicates and other numeric variables. However, FOL can be expanded into alternative systems of logic (higher-order logics for example) which do allow these same possibilities while staying more rigorous and closer to set-theory than CG or DL.
In CA, however, all formalisations have their limits. As Quine (1968) pointed out (and quoted before in § 2.2.3): 'A question of the form 'What is an F?' can be answered only by recourse to a further term: 'An F is a G'. The answer makes only relative sense: sense relative to an uncritical acceptance of 'G'' (p. 204). Hence, the applicability of FOL as a CA tool is dependent on the reducibility of the concepts, which are to be analysed, to more basic concepts, which are already defined or are even part of the structure of FOL itself. As an analytical tool, therefore, logic and set-theory are extremely useful in the analysis of concepts, which are reducible to sets, such as part-whole relations in formal ontology (*e.g.* Smith 1996) or demographic events such as population changes (Brons 2001; 2003). However, if such a reduction is not possible it is less likely to be as powerful a tool as one might wish. This too is illustrated by the examples above: the formalisations seem to add little clarification to the ordinary language description provided first.
The problem is that logics are rather 'poor' meta-languages (languages used to describe concepts in the object-language), while Tarski (1935) proved that to analyse a concept satisfactorily (in his case: 'truth') the meta-language must be substantially richer in expressive power than the object-language. This, however, implies that a full conceptual

analysis of most social scientific concepts is virtually impossible, since there is no expressively 'richer' language available than the ordinary language these concepts are from, while, on the other hand, ordinary language lacks the rigor needed for sharp description and definition.
Nevertheless, the application of FOL in CA may induce surprising results. Conceptual analyses are theoretical statements and when formulated in ordinary language, it is often difficult to grasp all the implications of such a statement. Recent research in the logical formalisation of social scientific theories has affirmed this point. For example, Bruggeman (1996) and Péli (1997) found that Hannan and Freeman's (1977; 1989) theory of organizational ecology included several logical fallacies, while, on the other hand, Kamps (1999) discovered that the premises of a specific theory presented in Zetterberg (1965) have more implications than foreseen in the original (ordinary-language) theory. Generally, 'logical formalization helps to make theories consistent, their arguments conclusive, their presentation parsimonious, their definitions clear and distinctive, and their conceptual framework transparent' (Péli, Pólos & Hannan 2000, p. 195).

2 / 3 / 4 / summary and conclusions

CA has been applied in a number of scientific fields; especially in nursing, social and political science and computer and information science. Concepts in social and political science and in nursing are rarely the simple concepts assumed by conceptual analysis (CA) in philosophy. Rather, these are complex scientific terms referring mostly to social phenomena instead of concrete objects. Nevertheless, CA in social and political science and nursing is attempted by application of a relatively small set of rules. Most of the theories of applied CA focus strongly on synonyms, homonyms and other concepts related to the analysandum. A concept $\mathcal{C}$ is regarded to be an element of a set $\mathcal{S}$ of related concepts (such as the before mentioned synonyms and homonyms) that should be clearly distinguished from $\mathcal{C}$ and from each other. $\mathcal{S}$ must be distinguished from the linguistic context or conceptual framework $\mathcal{O}$. The first refers to the set of synonyms, homonyms and other similar concepts, the second to the language-game, or conceptual framework the concept $\mathcal{C}$ is part of.
In several fields it has been attempted to use formal tools in CA. While this may be very useful in order to get more rigorous, more transparent and less ambiguous results, it comes with some problems of its own. Different styles of formalisation may result in different analyses, and moreover, formalisation is most helpful in analyses of concepts that can be (partly) reduced to logical or set-theoretical concepts. Hence, though helpful, formal logic is no wonder drug.

2 / 4 / concepts, ideas and fashions

The previous sections dealt mainly with rather abstract concepts (§ 2.2) and theoretical terms and concepts (§ 2.3). However, as was explained in subsection 2.1.2, some scientific fields deal with concepts as 'social factors' or 'theories'. The notion of "concepts as theories" may seem similar to "theoretical concept", but there is an important difference: the latter regards concepts as parts of theories, while the first sees concepts as theories themselves.
There are two scientific fields dealing explicitly with concepts as 'social factors' or 'theories'. These are conceptual history, especially *Begriffsgeschichte* (§ 2.4.1), and management fashion research (MFR) (§ 2.4.2). The historical approach to CA is predominantly German. *Begriffsgeschichte*, (translated alternatively as "history of concepts", "conceptual history", and "historical semantics") is a current in the history of ideas and/or intellectual history, which studies the products of (the) human mind(s), especially those related to politics. Management fashion research (MFR) is a research field with rather little reference to concepts, but in a sense studying concepts nevertheless. The object of study of MFR are 'fads and fashions' in management theory.
Begriffsgeschichte and MFR share their focus on the temporal and social contexts of concepts. Concepts are theoretical entities specific to specific social groups and specific times. Hence, concepts change and different groups use different concepts. Concepts, including *key words*, have a social life of their own (Williams 1976). Often, conceptual differences reflect differences in worldview (or theoretical affiliation) between groups (such as scientific fields or communities). Therefore, many concepts are necessarily ambiguous (see also § 2.1.2). Gallie described more or less the same phenomenon in his 'Essentially contested concepts' (1956). *Essentially Contested Concepts* (ECCs) (such as "democracy" or "work of art") belong (mainly) to fields such as aesthetics, political and social philosophy and the philosophy of religion. ECCs are complex concepts in that they are composed of several parts or features. Competing versions of the ECC refer differently to the importance and contributions of these composing parts or features; hence, ECCs are variously describable. Generally, ECCs are derived from some original historical exemplar. The contested nature of these concepts is essential to the debates they are used in. The parties recognise the contestation, but all claim their interpretation is the only right one. A definition of an ECC is necessarily normative (and political) as it captures the interpretation of a single group only.

2 / 4 / 1 / history of concepts and ideas

Intellectual history and history of ideas (HoI) study patterns of thought, concepts, categories, classifications, etc. in earlier ages. Although there is a strong emphasis on the history of political ideas in these fields, its scope has been wider. The difference between

intellectual history and HoI is that the first focuses on the ideas in (of) a period and the latter on the history of an idea through periods. HoI is practised more in continental Europe, intellectual history more in English-speaking countries. Sub-fields of intellectual history and/or HoI (or fields related thereto) include German *Begriffsgeschichte* and French history of *mentalités*. (*Mentalités* are the collective symbols, concepts and representations of a society or part thereof.) HoI as a current in the field of history has to be distinguished from specific histories of ideas of / in scientific fields, such as the histories of geographical or economic thought, although the latter could be regarded as special cases of the former. In general HoI studies far more specific ideas than whole scientific fields.

The most important theoretical contributions to HoI were those of Skinner, Pocock and Foucault. Skinner (1969, 1978) criticized, in what became known as the 'Cambridge revision', the 'contextualism' and 'textualism' (his terms) in historical analysis. The first, contextualism, explains concepts and ideas referring to the socio-economic conditions at their genesis; the second, textualism, presumes that concepts can be explained from texts alone and that historical texts all answer questions that have stayed more or less the same during history. According to Skinner, both are wrong. Contextualism is wrong because the meaning of a concept or the intention of an idea should be analyzed independently from its genesis (and one should study meaning before genesis). Textualism, on the other hand, is wrong because it tries to derive more from a text than is in it. There are no eternal, constant, unchanging questions. Each time has its own specific problems and questions. Hence, Skinner rejects the idea that we can 'learn from history'.

Pocock (1960, 1975) was strongly influenced by the philosophy of language (§ 2.2). In classical (early) philosophy of language, language and terminology were mostly regarded as more or less (politically) neutral instruments (the rare exceptions include Marx & Engels 1846/1932). Pocock disagreed with this. Language determines the margins of (political) thought. Language determines what can be thought (see also § 2.1.1). Hence intellectual historians should study language (use) in periods before studying the ideas of that period. Studying the nature of political thought in a period is advanced more by researching the meaning of and relations between concepts than by trying to understand the intentions of authors (which is, moreover, impossible without understanding the language of the period first).

Like Pocock, Foucault (1966, 1969) regards language, or 'discourse' as he calls it, as pivotal. A core concept of Foucault's (1966) thought is "*épistème*". *Épistèmes* are relatively constant (over longer periods) structures in the discourse. *Épistèmes* structure reality, determine how we experience reality, how we classify objects in (parts of) reality, and what things in (parts of) reality we perceive. Language is the instrument an *épistème* uses to enforce this structuring of reality. Defining characteristics of *Épistèmes* and discourses are what they exclude, for example, as taboo, madness and/or untruth, rather than what they include. Hence, to study an é*pistème* one must start at the excluded. This focus on exclusion points at the fact that language, discourse and é*pistème* are not passive aspects of socio-historical reality, but are expressions of power.

Conceptual history or historical semantics originated in the 19th century but became a systematic field within history only fairly recently (den Boer 2001a). The first who mentioned – as far as now known – the idea that the meaning of concepts changes was Thucydides in his *History of the Peloponnesian war* (5th century BC). Far more recently, Lovejoy (*e.g.* 1948) described the history of some key concepts, which he analyzed and defined rigorously (see also 2.2.2). Lovejoy probably coined the term "history of ideas". An important predecessor of conceptual history as a field within history is a similar sub-field within philosophy. Philosophical conceptual history is mainly intended to improve and/or clarify the terminology or linguistic toolkit of philosophy. The approach is typically German and had very little impact on the field of history. Its most important product is the *Historisches Wörterbuch der Philosophie* (Ritter *et al.* (eds.) 1971*ff*). Even before the introduction of *Begriffsgeschichte* in the early 1970s, German historians dealt with conceptual history. Niederman (1941), for example, published a still widely referred to history of the concept of "culture". However, only after Koselleck (*e.g.* 1972; 1978; 1979) founded the new field, conceptual history really took off.

Begriffsgeschichte is a mix of HoI and social history. It had considerably more impact than the conceptual history in philosophy. Yet this influence was still mostly limited to German-speaking countries and other countries that are – to some extent – in the German sphere of influence, such as the Netherlands (*e.g.* Freeden 1997; den Boer 1998). With the relatively recent publication of an English-language introduction to *Begriffsgeschichte* (Hampsher-Monk, Tilmans & van Vree (eds.) 1998), this, however, may change in the near future. The most important work in *Begriffsgeschichte*, without a doubt, is the eight volume *Geschichtliche Grundbegriffe: Historisches Lexikon zur politisch-sozialer Sprache in Deutschland* (Brunner, Conze & Koselleck (eds.) 1972-98), which was finished recently and which proved to be a very useful source book for chapter 3. The starting point of the *Geschichtliche Grundbegriffe* is the idea of the *Sattelzeit* (*e.g.* Koselleck 1979; 1987). The *Sattelzeit* is the period of social transformations caused by the industrial revolution and political change (see also § 3.2). The German *Sattelzeit* was from 1750 to 1850; in France it started earlier, in 1680. The period, and its associated change may – more or less – coincide with the transfer from Foucault's (1966) classical to postclassical or modern *épistème*. Den Boer (2001a), however, is very critical about this temporal delimitation. In his opinion, the temporal boundaries are based on rather vague arguments. Moreover, the idea proved to be self-confirming and leading to circular reasoning.

Begriffsgeschichte has not been applied exclusively to German conceptual history. The *Handbuch politisch-sozialer Grundbegriffe in Frankreich 1680-1920* (Reichardt & Schmitt (eds.) 1985*ff*) deals with similar concepts in France, as the title suggests, but in a wider period. Recently a Dutch project in *Begriffsgeschichte* started, resulting in a number of books, including one on the history of the concept of "*beschaving*" (civilisation) (den Boer (ed.) 2001).

Although *Begriffsgeschichte* is now the dominant form, conceptual history has been applied more widely, regarding scope and period. Klaes (2001), for example, gives some examples

of conceptual history within economics and reviews the possible contribution of *Begriffsgeschichte* hereto.

Disregarding its types and variants, there are some common concepts and problems in conceptual history. An important distinction is that between 'semasiology' and 'onomasiology'. Semasiology is the study of the changing meaning of a specific concept or term. Onomasiology is the study of the different words (terms, labels) used throughout history with similar or overlapping meanings. A potential danger to all kinds of conceptual history is the 'etymological phalacy' (Lyons 1981): the assumption that the 'original', oldest known, meaning of a word is, necessarily and because of fact, its correct meaning. The fact of the matter is that 'most words in the vocabulary of any language cannot be traced back to their origin. (…) All the etymologists can tell us, depending upon evidence, is that such and such is the form or meaning of a particular word's earliest known or hypothetical ancestor' (Lyons 1981, p. 55).

2 / 4 / 2 / management fashions

Although the similarities between conceptual history and management fashion research (MFR) may not seem to be obvious, they are there nevertheless. Both fields study a type of concepts that function as flags to their users, concepts that are strongly theoretical and that are essentially ambiguous and contested. Both fields focus on the temporal and social context of concepts: conceptual history by studying the social causes and effects of conceptual change, MFR by adopting a *fashion approach*.
Management fashions, or sometimes contemptuously called management *fads*, are concepts designating trends in management. Abrahamson (1996) defines a management fashion as 'a relatively transitory collective belief, disseminated by management fashion setters, that a management technique leads rational management progress' (p. 257). Abrahamson (1991; 1996) set the stage for a new field of research in which concepts have been studied with very little influence from or contact with the fields dealt with in the previous sections. This might be (at least partly) due to the fact that the term preferred is "management fashions" and not "management concepts" (although some exceptions to this rule exist) and consequently that the perspective adopted in these studies is that of fashion instead of language.
The fashion perspective of management fashion research (MFR) is reflected in the focus on the processes of creation and dissemination of management fashions. Abrahamson (1996) dealt with the 'management fashion setting process'. Management fashion setters are, for example, consultants, management journals and management gurus. However, 'most management innovations may be created by managers' (Abrahamson, 1996, p. 266). Based on studies in the publishing industry, he distinguishes four stages in the management fashion setting process: (1) creation, (2) selection, (3) processing, and (4) dissemination. In

the first stage, new practices, techniques and ideas are developed (or old ones are revived). Abrahamson, however, pointed out that 'new' fashions are not necessarily actually new: 'fashion creation may involve either inventing management techniques that only appear to be improvements or rediscovering / reinventing old management techniques that were invented previously and forgotten' (265-266). In the second stage, management fashion setters select from this supply a small number of techniques which they adapt in the third stage to market demand. Finally, in the fourth stage, fashion setters attempt to disseminate the new fashion.

Although managers take part in the management fashion setting process, their prime role is as users and applicators of management fashions. In this role, they have to be convinced of the benefits for their company and of the rationality and innovativeness of the management fashion. Stakeholders expect managers to manage their organizations and employees rationally (*e.g.* Rogers, 1995; Abrahamson, 1996). Besides rationality, Sahlin-Andersson (1996) distinguishes two other 'editing rules' in the creation of management fashions: context and formulation. A concept develops in a certain context. This, however, is not always fully acknowledged. Often unnoticed, for example, is the incorporation of national preferences in management concepts. A management concept has to be formulated in general terms. There is, however, considerable variation in the degree of clarity, detail, and interpretative viability.

Convincing managers is the main goal of the third (and fourth) stage of the fashion setting process. In this stage the fashion is processed into a appealing proposal for organizational improvement. 'It must, therefore, articulate (a) why it is imperative for managers to pursue this goal and (b) why this technique provides the most efficient means to attain these goals' (Abrahamson, 1996, pp. 267-268). Arguments for adopting the fashion are usually supported with a number of successful examples (*prototypes*).

Røvik (1998) studied the argumentative texture of fashion-setting texts. These texts usually promise enhanced performance after adoption and bankruptcy in case of non-adoption. The fashion or concept is presented as an easily understandable and universally applicable commodity with a catchy title. Moreover the fashion or concept is presented as timely, innovative and future-oriented. Finally, management fashions or concepts have to leave room for interpretation (Benders & van Veen, 2001). Interpretative viability or conceptual ambiguity is necessary for being applicable in many situations.

Notable in management fashion research is the strong attention to the *context* of management fashions, often even to the extent of the context being part of the fashion or concept. Context is regarded as an essential part of a management concept or fashion and without a thorough understanding of this context, it is not possible to understand the concept or fashion. This strong attention to context is more or less implied by the fashion perspective, which strongly focuses on *temporal context*, the genesis (creation) and dynamics (rise and fall) of concepts (fashions). Non-temporal context, however, is also taken into account, as Sahlin-Andersson (1996), for example, points at cultural and

linguistic context. This last type of context posits the fashion or contexts within a broader framework or system and is (hence) called *systemic context*. Hence, a management fashion *MF* can be defined as a triplet of $\mathcal{C}$*, systemic context $\mathcal{X}$ and temporal context $\mathcal{H}$:

D2.3 $MF =_{\text{def.}} \langle \mathcal{C}^*, \mathcal{X}, \mathcal{H} \rangle$.

The different characteristics of management fashions or (/as) concepts mentioned above (and in the MFR literature) can be distributed between these three elements. The first, $\mathcal{C}$* could be called 'pure concept' (or something similar). It includes the label, term or title of the fashion, the solution offered and a prototype or example. The second element, $\mathcal{X}$ is the systemic context of the fashion. It includes language, formulation and logic (or rationality), but also a description of the actual problem (to be solved by this management concept) and a reference to the socio-cultural context. The third and final element is the temporal context $\mathcal{H}$, which includes the creation (or rediscovery), dissemination, (re- / de-) institutionalisation, and (eventual) decline of the concept.
The elements of D2.3 could alternatively be described as *concept*, *theory* and *fashion* respectively. This points to the most interesting fact about MFR: that its subjects are concepts, theories and fashions all in one. The same, however, could be claimed about concepts in social and political science. Concepts such as "society" and "democracy" are not just labels for things in some 'external reality'. These concepts refer to and label theories on social reality and political structure. Most interesting, however, about MFR is its fashion perspective. Ten Bos (2000; 2002; see also § 2.1.2) defends this fashion perspective against utopian perspectives. The difference is that a fashion perspective assumes fleetingness: fashions come and go. The utopian perspective on the other hand, propagates final truths and ultimate solutions. The fashion perspective might not just be useful in MFR, it may also provide a more modest, but also more realistic, starting point for CA in social science. Concepts should be regarded as fashions rather than as *aternae veritates* (Nietzsche 1878, § I.11; see also § 5.1).

2 / 4 / 3 / summary and conclusions

Conceptual history and MFR share a strong interest in the temporal and social context of concepts. Concepts are dependent on their socio-historical context and vice versa. MFR even considers context to be *part* of a concept (management fashion). In subsections 2.2.4 and 2.3.4 it was concluded that context was important in the determination of the meaning of a concept. A concept $\mathcal{C}$ was held to be an ordered couple of term $\mathcal{T}$ and meaning $\mathcal{M}$ (D2.1*) that is somehow related to its referent $\mathcal{R}$, linguistic context $\mathcal{O}$ and set(s) of synonyms, homonyms and other similar concepts $\mathcal{S}$. Conceptual history and MFR add the temporal context, the history of the concept $\mathcal{H}$ and a wider notion of context $\mathcal{X}$, such that $\mathcal{O} \subset \mathcal{X}$ and $\mathcal{S} \subset \mathcal{X}$. More importantly, MFR suggests that concepts do not just *have*

context, but that the context(s) *is* (are) essentially *part of* the concept. As management fashions were defined as $\langle \mathcal{C}^*, \mathcal{X}, \mathcal{H} \rangle$ (in D2.3) and $\mathcal{C}^*$ includes term $\mathcal{T}$ and a description of the fashion or concept which is somewhat similar (but not completely identical) to meaning $\mathcal{M}$, D2.1* and D2.3 could be combined into:

D2.4* $\mathcal{C} =_{\text{def.}} \langle \mathcal{T}, \mathcal{M}, \mathcal{X}, \mathcal{H} \rangle$,

or, assuming that $\mathcal{X}$ consists of $\mathcal{O}$ and $\mathcal{S}$:

D2.5 $\mathcal{C} =_{\text{def.}} \langle \mathcal{T}, \mathcal{M}, \mathcal{O}, \mathcal{S}, \mathcal{H} \rangle$.

MFR offers one more valuable insight for CA by means of its fashion perspective. Traditionally, CA is more or less 'utopian' in the sense that it aims at final solutions, final analyses or definitions of concepts. The fashion perspective points at the fact that concepts come into and go out of fashion. Concepts change and disappear and new concepts are born all the time. Moreover, fashion is a social process dependent on group dynamics and social processes of dispersion. If concepts are fashions, there are no final solutions in CA. This same conclusion was reached by Gallie, for example, but in a very different argument. Gallie claimed that many concepts are essentially contested because different groups (or theories) differently value the different composing parts or features of these concepts. In cases like these, CA cannot result in final solutions, but it can provide a common language in which the different interpretations can be translated. It can provide the translation rules necessary for comparison and reasonable communication.
The following sections relax the isolated nature of concepts in traditional CA. Sections 2.5 and 2.6 deal with concepts within wider frameworks, with concepts as parts of linguistic context $\mathcal{O}$ and with $\mathcal{O}$ as a constitutive element of concepts. Finally, section 2.7 attempts to construct a synthetic model of concepts and a methodology for CA in social science based on the ideas presented in this chapter.

2 / 5 / polarity, dialectics and deconstruction

The preceding sections dealt with the analysis of individual or isolated concepts only. However, the focus of this research project is not on an isolated concept, but on a pair of concepts and the relationship(s) therebetween: "culture" and "economy". In the title (and text) of this book, this pair of concepts is called a "dialectic". A *dialectic* is a pair of concepts (or phenomena) that are conceived to be binary opposites but that do in fact interact and/or overlap. The culture - economy dialectic (CED) is hardly a special case. Throughout the history of CA, concepts have been classified mostly by dichotomies (*e.g.*

Sowa 2000). Moreover, binary oppositions seem to play an extremely important part in human thought (*e.g.* McKellar 1957; Gombrich 1959/77, p. 314; Riegel 1973; Needham 1980; Maybury-Lewis and Almagor (eds.) 1989). However, while many scientists recognise the importance of *dialectical thought*, *concept dichotomization* or *dual organisation* (to name but a small selection of labels suggested for the phenomenon), 'even at the start of the twenty-first century little is known about the nature of dialectical thinking and its effects on basic reasoning, judgment, and decision-making processes' (Peng & Ames 2001, p. 3634)
In this section the origins of dialectical thought (§ 2.5.1), the answer of modern Western philosophy (§ 2.5.2) and its relationship to the CED (§ 2.5.3) will be explained.

2 / 5 / 1 / polarity and the origins of dialectical thought

Dialectical thought, if not universal, is an extremely widespread phenomenon (*e.g.* Maybury-Lewis 1989). Moreover, it has a very long history. The division of ancient Egypt in lower and upper parts with different pharaohs, for example, was not based on geographical or historical reasons (alone) but on philosophical and cosmological ones. The idea that each totality is composed of pairs of opposites was essential to ancient Egyptian thought and therefore, Egyptian kingship had to be dualistic (Frankfort 1948).
Dialectical thought also strongly influenced early Greek thought. Heraclitus, for example, argued (a.o.) that everything is the product of dialectical opposition and according to Protagoras 'there are two sides to every question, exactly opposite to each other' (Diogenes Laertius IX 51 / 74 A 1). In fact, almost all Greek speculative philosophy was based on two logical forms: *polarity* and *analogy* (Lloyd 1966). Objects were classified either as different (polarity) or identical (analogy). The distinction was (usually) interpreted and applied very strictly: if two objects were perceived to be similar, it was assumed they were similar in every respect. Interestingly, the mutually exclusive but together all-encompassing categories of analogy and polarity function as a polarity themselves, but on a higher level. In a sense, it is a meta-polarity.
Greek and similarly dialectical Jewish thought evolved in Europe into Medieval Christian thought, but – according to Jung (1954) – also into alchemy. Alchemy is not just gold-making as usually believed, but much more a system of thought based on the *mysterium coniunctionis*. The goal of Alchemy is to dissolve binary oppositions (sometimes grouped into a *quaternio*: two crossing binary oppositions) into the *mysterium coniunctionis*. Similarly, in Medieval Christian thought, binary opposites were supposed to be dissolved in the *coïncidentia contradictorum*, in God (*e.g.* Cusanus; Bruno).
Dialectical thought is not unique to the West. It was present, for example, in ancient China (Taoism) and Persia (Zoroastrianism) and still can be found in different cultures all around the world (*e.g.* Maybury-Lewis & Almagot (eds.) 1989). According to Needham (1980) there is 'a universal tendency to think in twos' (p. 229). The importance of dialectical

opposites or binary pairs in human thought poses the question about its origins. Several answers to this question have been suggested. Hallpike (1979), for example, assumed that binary thought was induced by the 'twoness of reality' (p. 234). In other words, it is not thought that is composed of pairs of dialectical opposites, but the world itself. The fact that upon inspection many examples of dialectical thought prove to exist in thought alone refutes Hallpike's theory. Hence, another answer to the question is needed. Lloyd's (1966) answer to the question about the origins of dialectical thought is of a very different nature. According to Lloyd (1966), antithesis is the simplest form of classification and it is this simplicity which guaranteed its popularity. Mayburg-Lewis (1989) further developed this argument:

> 'The attractiveness of dualistic thinking lies, then, in the solution it offers to the problem of ensuring an ordered relationship between antitheses that cannot be allowed to become antipathies. It is not so much that it offers order, for all systems of thought do that, but that it offers equilibrium. Dualistic theories create order by postulating a harmonious interaction of contradictory principles.' (p. 13)

Still, this theory seems to be unsatisfactory. Indeed, thinking in two is the simplest form of classification and can be harmonious, but a system of three (or any other small number) is not much more complicated and not necessarily less harmonious. If simplicity and harmony alone explain the phenomenon, there should at least be some cultures that opted for the very slightly less simple three- or four- category systems. There seem to be none.
Thinking in opposites or binary concepts may have to do with sex. Baring and Cashford (1991) claim that the human tendency to think in oppositions is the result of the replacement of the Mother god by a Father god. This happened in Babylonian religion, for example, around 2000 B.C. The Goddess was associated with nature as a chaotic force to be conquered. The male God was its opposite: the conquering force. According to Baring and Cashford, the whole of Judeo-Christian thought is strongly influenced by this legacy of Babylonian mythology:

> particularly the opposition between creative Spirit and chaotic Nature, and also the habit of thinking in oppositions generally. We find this, for instance in the common assumption that the spiritual and the physical worlds are different in kind, an assumption that, unreflectively held, separates mind from matter, soul from body, thinking from feeling, intellect from intuition and reason from instinct. When, in addition, the 'spiritual' pole, of these dualisms is valued as 'higher' than the physical pole, then the two terms fall into an opposition that is almost impossible to reunite without dissolving both of the terms. (p. xii)

An alternative explanation, but still based on the male - female dichotomy, is given by Barth (1992). Barth suggests that concept dichotomization, as she calls the phenomenon, is related to ancient thought about the logic of ordered couples (see § 1.3.2). The modern

interpretation thereof was introduced at the end of the 19th century by Peano, while earlier ordered couples were interpreted in terms of poles or sexes. The effect of this kind of ordering is that:

> since there are not as many as five poles on a magnet, or five sexes, it is natural for people who use these representational means to develop the assumption that all binary relations that are not-trivially transitive and that form linear or partial orderings must be of a lesser ultimate reality. They will be, and have noticeably been, tempted to consider a dualistic conceptual ordering of all the phenomena in the universe as philosophically more fundamental than transitive comparative ordering (…). (p. 67)

Although dialectical thought is not unique to the Western traditions, but seems to be a universal human tendency, there are differences in how people deal with opposites and the contradictions they produce. In Western thought these contradictions need to be (dis-) solved as in *dialectics* or in *deconstruction*; in Chinese (or even Eastern in general) thought contradictions are much more accepted (*e.g.* Peng & Nisbett 1999; Peng, Ames & Knowles 2001).

2 / 5 / 2 / dialectics and deconstruction

Dialectical thought dominated Western philosophy throughout Antiquity and the Middle Ages. In the 18th century, however, Kant introduced a third, intermediate category connecting the first and second. The resulting trichotomy evolved into the 'thesis, antithesis and synthesis' of early 19th century German *dialectics*. Here, especially in the work of Hegel (1807; 1812-6), thinking in binary oppositions reached its peak, but also, in a sense, its dissolution. According to Hegel, opposites, thesis and antithesis, are dissolved and reproduced on a higher level (*aufgehoben*) in their synthesis. Hegel's students, and to some extent Hegel himself too, however, sometimes constructed binary oppositions into reality, later to dissolve (*aufheben*) them in another successful application of 'dialectical logic'.
The concepts of "dialectic" and "dialectics" should be distinguished carefully. As mentioned above, the first refers to a pair of concepts (or phenomena) that are conceived to be binary opposites, but that do in fact interact and/or overlap, to a reciprocal relationship, an interaction or a conflict. The second can be the plural of the first, but generally refers to a family resemblance of theories on thought and reality based on change, opposition and conflict (confusingly, the latter is sometimes also called "dialectic" rather than "dialectics"). As recognised by Hegel, dialectics started with the before mentioned Heraclitus: 'Hier sehen wir Land; es ist kein Satz des Heraklit, den ich nicht in meine Logik aufgenommen' [habe] (Hegel 1833, p. 320). Heraclitus argued that all things change continuously: 'We step and do not step into the same rivers; we are and we are not' (fragment 49a); and that all perception is relative: 'The way up and the way down is one and the same' (fragment 60).

Although Heraclitus' dialectics was mainly a theory on nature and material reality and the perception thereof, the idealist Hegel applied it to thought and ideas. Later, Engels reapplied it to material reality in *Anti-Dühring* (1877-8) and *Dialektik der Natur* (1873-83/1925). Dialectics, however, is not limited to Heraclitus, Hegel and Engels. A staggering number of philosophical theories have been labelled dialectic. Bhaskar (1993) distinguishes five types of dialectics based on their subjects alone (ranging from ontology to practice). Within any of these types there are many competing philosophies and interpretations.
Inspired by (some form of) dialectics, Piaget (1974) suggested that there are two types of contradiction: (1) real contradictions, which result from errors in reasoning; and (2) natural contradictions, which result form disequilibria in knowledge: 'un point de vue trop peu défendu: qu'elle ne consitute ni une nécessité interne de la pensée, ni un accident dû à de simples défauts de formalisation, mais qu'elle est l'expression de déséquilibres initialement inévitable dus au manque d'ajustement réciproque entre les facteurs positifs et négatifs' (p. 5). In Piaget's version, dialectical synthesis is re-equilibration. Despite the bewildering number of dialectical theories and philosophies, none of these seems to have developed into a consistent theory of the analysis and synthesis of contradictions.

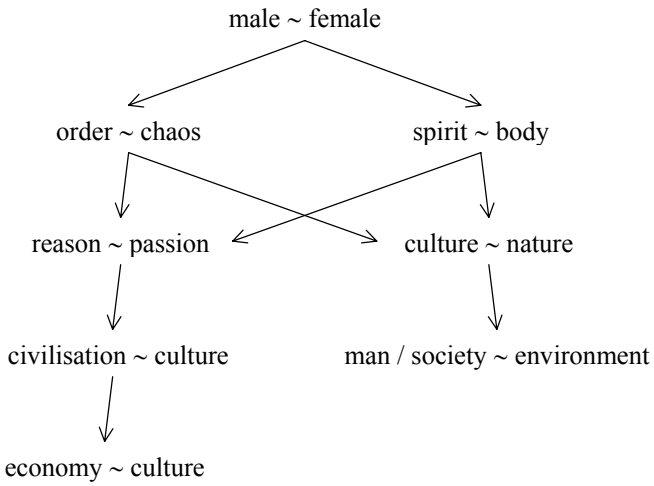
In the 20th century, dialectical thought became particularly strong in *structuralism*, applied originally to language by de Saussure (1916), but later also to culture. Lévi-Strauss (1958) analysed culture as models of binary oppositions. Levi-Strauss regarded binary oppositions as the logic of the human mind, structuring reality in their image. *Post-structuralism* and especially *deconstruction* (Derrida 1967) opposed the hierarchical aspect of much of dialectical thinking. In almost all cases one of the binary opposites is supposed to be superior to the other. Culture, for example, is often seen as superior to nature. These hierarchies are, through chains of connotations, linked to the original hierarchical relationship between the male and the female. The goal of deconstruction is to demolish or reverse these hierarchies.
Dialectics and deconstruction are the main (Western) answers to dialectical thought. These are different answers, however. The goal of dialectical analysis is (usually) to show that an opposition or contradiction is not an opposition or contradiction at all, that the perceived opposites are very difficult to distinguish, melt into each other, overlap, interact. The goal of deconstruction is merely to unmask hierarchies in binary oppositions and sometimes to replace these with different hierarchies, not necessarily to dispose of the binary opposition itself.

2 / 5 / 3 / summary, conclusions and the origins of the CED

There is a strong tendency in human thought to classify reality in pairs of opposing concepts. *Dialectical thought* can be found in all times and all cultures. The phenomenon is most influentially explained by reference to the male - female dichotomy, which, through

connotations, is assumed to have given birth to many other specific dichotomies and dialectical thought itself. However, dialectical thought is a product of the mind, not of reality and may, therefore, deceive us. Philosophy and science came up with a number of ways to deal with these conceptual dichotomies. The first was dialectics, which – as a philosophical theory – aimed at the dissolution of dialectics as pairs of opposed concepts. The second was deconstruction, which focused on the relationship between the composing concepts of dichotomies or dialectics. Often one of these concepts is considered to be more important or more fundamental. Deconstruction attempts to reverse or remove these hierarchies. Neither dialectics nor deconstruction provided a consistent theory on how to reach these goals.
Interestingly, the CED itself seems to be related to the origins of dialectical thought itself. The culture - economy dialectic is connected to the male - female dichotomy through a relatively small number of links. Figure 2.4 summarises two related chains of connotations starting from the most basic dichotomies of the male and the female, order and chaos and spirit and body (compare Baring & Cashford above):

figure 2.4: *series of binary oppositions*



The first step in the chains of connotations represented in figure 2.4 is the introduction of two pairs: "order" - "chaos" and "spirit" - "body". "Order" and "spirit" (or "mind") are (or were) generally regarded to be male; "chaos" and "body" were female. These two pairs, in their turn, gave rise to the CED and the related man - environment dialectic (MED) that became the subject of geography. "Reason" was associated with "order" and "spirit" and, therefore male; "passion" was related to "chaos" and "body" and, therefore, female. Similar chains of connotations can be found on the other side of the figure.

It is important to note that "culture" is represented in figure 2.4 both on the 'male' and the 'female' sides of the conceptual pairs. This seems to be contradictory, but it is not. Although the labels are the same, these are not the same concepts, they have entirely different meanings, which becomes clear when you take their connotational chains into account. Culture as the opposite of (reasonable) civilisation is the social equivalent of passion; culture as opposed to nature is the human order imposed upon chaotic nature.
The conceptual evolution of the CED and the different paths therein are further dealt with in chapter 3. The next section deals with concepts as parts of ontologies, languages or conceptual frameworks. Together with conceptual dichotomies these are part of the linguistic and/or ontological context $\mathcal{O}$ of a concept.

2 / 6 / language and ontology

Concepts are not isolated 'objects'; they are parts of conceptual structures, frameworks or languages. These form their linguistic and ontological context of the concepts. Concepts are not meaningful in themselves; they only have meaning within this wider context. Particularly scientific concepts 'have to be interpreted in the light of an implied social ontology' (Gittler 1951, p. 365). Hence, it is not just the (meaning of the) concept itself that should be analysed, but also its linguistic and/or ontological context. Although traditionally regarded as part of metaphysics and dealing with 'existence', ontology is also the philosophical and scientific field that deals with conceptual frameworks. Subsection 2.6.1 focuses mainly on ontology as a tool for specification of conceptual structures or frameworks. This kind of ontology is mainly practised in fields like artificial intelligence (AI) and knowledge representation (KR). In these same fields a formal technique for analysing or mapping conceptual structures, Formal Concept Analysis (FCA) (see also § 2.3), was developed. FCA will be explained briefly in subsection 2.6.2.

2 / 6 / 1 / metaphysics and ontology

Metaphysics is generally interpreted as the study or philosophical theory of what is beyond nature and experience, of some more fundamental structure of reality. The term was coined in the first century BC by Andronicus of Rhodes as the title for a collection of fourteen books by Aristotle on subjects such as reality, existence and causality. The title for these fourteen books, μετὰ τὰ φυσικά, meaning 'after the physics' merely meant that these books were placed after Aristotle's books on physics. In the early 18th century Wolff proposed to divide metaphysics in four parts: (1) ontology, the study or theory of being or existence; (2) cosmology, the study or theory of the world; (3) rational psychology, the study or theory of

the spirit and/or soul; and (4) rational theology, the study or theory of God. Since Wolff, "ontology" is usually defined as 'the study of being'.

Although the term "metaphysics" became deeply embedded in philosophical terminology, it hardly has a fixed meaning. Bunge (1977), for example, distinguishes ten different interpretations of "metaphysics". Bunge himself suggests that 'metaphysics is *general cosmology or general science*: it is the science concerned with the whole of reality' (p. 5). This implies that all scientific effort is ultimately grounded in some metaphysical theory (*e.g.* Russel 1948; Lakatos 1969; Harvey 1969; see also Seager 2000). Metaphysics as the study of 'ultimate reality', however, is not what concerns us here. What does concern us is the fact that '*metaphysics can help solve pseudoquestions* that arise in science and originate in misconceptions. (…) *Metaphysics can dig up, clarify, and systematize* some basic concepts and principles occurring in the course of scientific research and even in scientific theories (…)' (Bunge 1977, p. 23). This 'digging up', 'clarification' and 'systematisation' is the goal of scientific or applied ontology.

Traditionally, *philosophical* or *existential ontology* (EO) was the study asking 'What things exist?' In recent decades the concept of "ontology" was associated with new fields and new questions. The key question in ontology in Artificial Intelligence (AI) and Knowledge Representation (KR) is: 'What things should we represent?' This is the field of *representational ontology* (RO). (*e.g.* Guarino 1995; Uschold & Grunninger 1996)

Koepsell (1999) claims that 'many real world problems do result from unclear ontologies', and that the goal of applied ontology is to remedy this 'by careful study of the categories of the social world' (p. 220). *Applied ontology* (AO) is often intended to specify the conceptual framework or language of a specific scientific field. (*e.g.* Singh 1982; Uschold *et al*. 1997; Smith & Mark 1999; Zúñiga 1999; Brons 2001) AO is closely related to *scientific ontology* (ScO), although there are important differences. ScO is closer to traditional ontology (EO) or metaphysics, while AO is more closely related to RO. 'The analysis we expect from scientific ontology concerns, in particular but not exclusively, the ontological categories and hypotheses that occur, either in a heuristic or in a constitutive capacity, in scientific research' (Bunge 1977, p. 10).

Social ontology (SO) studies what ultimately makes up social reality. As such it seems to be a special type of EO. However, SO could also be interpreted as the ontology of the social sciences. Hence, like ScO, SO is a mix of EO and AO. (*e.g.* Searle 1969; 1995; Thomasson 1997; Weissman 2000)

Formal ontology (FO), finally, is the study of formal categories such as parts and wholes, introduced by Husserl (1900-1) (see also § 2.3.3). FO has to be distinguished from formalisation in ontology, which is increasingly applied in all the before mentioned fields. (*e.g.* Smith & Mulligan 1983; Smith 1996)

The above distinctions may seem 'harder' than they are in practice. Some modern ontologists publish work in more than one, some even in all (Barry Smith, for example), of these fields.

The concept of "ontology" does not only refer to scientific or philosophical fields or theories but also to what (some of) these fields study. *An ontology* is defined by Gruber (1993) as a 'specification of a conceptualisation' (p. 200). Similarly, Uschold and Gruninger (1996) think of an ontology as 'an explicit account of a shared understanding in a given subject area' (p. 93). An ontology is a specified set of concepts, a conceptual structure or framework, a language. Ontologies, in this sense, are necessary for communication. The relationship of a concept to an ontology is both that of member to set and that of case to context. Within CA then, *an ontology* is the linguistic context $\mathcal{O}$ of a concept and *ontology* as a tool should (help) specify this linguistic context. Although both Gruber's and Uschold and Gruninger's definitions of "an ontology" are published in articles on RO, the type of ontology closest to this goal is AO. In practice, RO and AO seem to be closely related, the main difference being that RO is normative, while AO is descriptive.

There is no standard methodology in AO, nor is there in any of the other types of ontology (*e.g.* Uschold & Grunninger 1996; Rosenberg 1997). The most basic rule in ontology is probably 'Ockham's razor': *Entia non sunt multiplicanda praeter necessitatem* ('entities should not be multiplicated more than necessary'). (Although attributed to the 14th century philosopher Ockham, it has not been found in this form in any of his works.) Ockham's razor is the methodological rule in ontology that one should not assume more entities than necessary and that one should prefer the ontology that contains the smallest number of categories or types of entities:

> Our acceptance of an ontology is, I think, similar in principle to our acceptance of a scientific theory, say a system of physics: we adopt, at least insofar as we are reasonable, the simplest conceptual scheme into which the disordered fragments of raw experience can be fitted and arranged. (Quine 1948, pp. 35-36)

Bunge (1977) proposed ten rules for ScO, which could also apply to AO. However, Bunge's rules seem to be a bit obvious. His most important (most relevant in AO) rules are: (1) formalise everything (in logical, set-theoretical or other mathematical notation); (2) avoid words with an ambiguous meaning; (3) be rigorous and exact; (4) use objective terms only; (5) be systematic; (6) test for coherence but also for compatibility and contiguity with contemporary science. The most important of Bunge's rules is the first: formalisation. Most of the others will apply automatically in formal analyses. Bunge was, however, not alone in arguing in favour of formalisation in ontology and/or CA. Rather on the contrary. The defenders of formalisation also include, for example, Russell, who came up with the rule that 'Wherever possible, logical constructions are to be substituted for inferred entities' (1914, p. 115). A final important methodological rule can be derived from Quine's (1968) principle of ontological relativity (see § 2.2.3): in ontological research more ambiguous terms or concepts have to be defined in less ambiguous or preferably even unambiguous terms.

2 / 6 / 2 / formal analysis of conceptual structures

Related to RO, a formal mathematical technique for mapping and analysing conceptual structures was developed in artificial intelligence (AI) and knowledge representation (KR). This technique is called Formal Concept Analysis (FCA). FCA was developed by Wille (1982) as an application of ordered set and lattice theory. (For a brief non-mathematical introduction to FCA, see: Wolff 1994; for its mathematical foundations, see: Ganter & Wille 1999.) FCA is based on the philosophical idea of a concept having an intension and an extension (see § 2.2.3). The intension is the set of attributes necessarily true of an object for a certain concept to apply; the extension is the set of all the objects to which that concept applies. Based on this idea, Wille introduces the *formal context* of a set of concepts. The formal context is a table summarising the extensions and (rather simplified) intensions of a set of concepts. Table 2.2 gives an example.

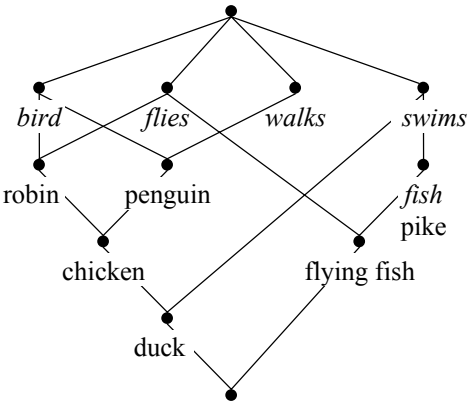
table 2.2: *formal context (example)*

	bird	fish	walks	swim	flies
pike		X		X	
duck	X		X	X	X
robin	X				X
penguin	X		X		
chicken	X		X		X
flying fish		X		X	X

From this formal context a line diagram, the *concept lattice*, can be calculated that reflects the structure of the concepts in the formal context. Such a diagram consists of circles and lines and the names of the attributes in the given context. Information from this diagram can be read following the rule: 'An object g has an attribute m if and only if there is an upwards leading path from the circle named by 'g' to the circle named by 'm'' (Wolff 1994, p. 431). (Note that there is mention of an upwards leading *path*, not of a single *line segment*.) The concept lattice of the formal context in table 2.2 is drawn in figure 2.5.

FCA is most useful in mapping the effects of changes in conceptual structures. Adding or deleting concepts from the formal context can result in dramatic changes in the lattice. In the example above, deleting the penguin and the flying fish, for example would combine the robin, 'bird' and 'flies' in a single point. Besides mapping conceptual structures, FCA could also be used to map 'intensional structures'. Constructing a formal context based on different definitions of more or less the same concept would result in a lattice that graphically represents the different interpretations of that concept and how these are related to each other.

figure 2.5: *concept lattice based on table 2.2 (example)*



Intensional structure could also be mapped with the help of the statistical technique of (hierarchical) cluster analysis. FCA, however, comes with an advantage. Contrary to cluster analysis, FCA shows the *genus* - *species* relationships between the different concepts mapped.
Although FCA may be useful either to map the linguistic context of a concept, the conceptual structure, or to map the diverse interpretations of that concept itself (its intensional structure), one serious objection has to be made to FCA. This objection is that FCA only works with extremely simplified intensions. Intensions of all concepts in the structure have to be summarised in a relatively small number of dummy variables. This, may, however, in many cases prove to be very difficult, and moreover, result in a substantial loss of information. (See § 4.4.2 for an application of FCA to the concept of "culture" as an example of the problems mentioned here.)

2 / 6 / 3 / summary and conclusions

Ontology is related to CA in (at least) two ways. Firstly, an ontology as a 'representation of a conceptualisation' (Gruber 1993, p. 200), as a conceptual framework, is the $\mathcal{O}$ in D2.5, repeated here:

D2.5$_R$ $\quad \mathcal{C} =_{def.} \langle \mathcal{T},\mathcal{M},\mathcal{O},\mathcal{S},\mathcal{H} \rangle$.

Secondly, ontology and CA both study concepts and may, therefore, be strongly related methodologically. The three most important methodological rules of ontology are (1) Ockham's razor (do not introduce more entities than necessary); (2) formalisation; and (3) define more ambiguous terms or concepts in less ambiguous or preferably even unambiguous terms.

Like ontology, FCA studies (and maps) conceptual frameworks or parts thereof. FCA is a formal mathematical tool used for mapping conceptual structures, frameworks or ontologies. It is especially useful to determine the relationships between different (groups of) concepts and to assess the effects of changes in conceptual frameworks. It could, moreover, be used as a formal tool in mapping the intensional structure of a set of semasiologically and onomasiologically (see § 2.4.1) related concepts, a set of synonyms and homonyms $\mathcal{S}$.
The next and final section of this chapter summarises the ideas on the analysis of the concept of "concept" presented in the preceding sections, elaborates on this and finally, presents some methodological guidelines for CA of the CED and in social science in general.

2 / 7 / a synthetic model and its application

In this final section of chapter 2, a synthesis into a single model of concepts for CA of the theories and philosophies on concepts and conceptual analysis (CA), dealt with in the previous sections, is presented. The goal of this chapter, and this section especially, is to construct a methodology that is based on the CA literature, that is applicable to concepts in social science and that can be used as a method for the analysis of the culture - economy dialectic (CED) in following chapters. Sartori's (1984b) influential CA methodology (§ 2.3.1) started with an analysis of the concept of "concept". Similarly, here an analysis of "concept" provides the foundations for a theory and methodology of CA. This analysis proceeds by constructing a model of concepts by specification and definition of its composing parts. The model, therefore, can be regarded as an ontology of parts or elements of concepts. Hence, the methods most applicable in building this model are those related to ontological research and ontology building as specified in subsection 2.6.1 (formalisation, Ockham's razor, etc.). The final parts of this chapter, subsections 2.7.2 and 2.7.3, consider the application of the model to CA in social science and to the analysis of the CED, respectively.

2 / 7 / 1 / a general model of concepts for CA

In subsections 2.2 and 2.3 a number of 'meaning triangles' were discussed. These meaning triangles are attempts to specify the basic components of concepts. Ignoring the details and differences in terminology in the different versions, meaning triangles assume that for every concept $\mathcal{C}$ there is an ordered triplet of term $\mathcal{T}$, meaning $\mathcal{M}$ and referent $\mathcal{R}$ in which meaning somehow connects the term to the referent: $\langle \mathcal{T},\mathcal{M},\mathcal{R} \rangle$. The referent $\mathcal{R}$, however,

is (generally) not regarded to be part of the concept itself, but of the extra-linguistic reality the concept refers to, which would imply that a concept *is* $\langle \mathcal{T},\mathcal{M} \rangle$ and *has* $\mathcal{R}$. Alternatively, Jackendoff (2002) defines a word as a 'triplet of phonological structure, syntactic structure, and meaning' (p. 51; see also § 2.1.2). If phonology and syntax are summarised as "term" we end up with the same result:

D2.1*$_{R}$ $\mathcal{C} =_{def.} \langle \mathcal{T},\mathcal{M} \rangle$.

Of these two elements, only meaning $\mathcal{M}$ needs further analysis ($\mathcal{T}$ is a singleton). Meaning is usually the ultimate goal of CA. Meaning $\mathcal{M}$ is what connects the term $\mathcal{T}$ to the referent $\mathcal{R}$. Meaning determines whether the term $\mathcal{T}$ is applicable to an object x; whether x belongs to the extension $\mathbb{E}$ of the concept $\mathcal{C}$; and if so, to what extent. If the extension $\mathbb{E}$ of $\mathcal{C}$ is defined as the set of all 'things' to which $\mathcal{C}$ applies (the set of instantiations of $\mathcal{C}$) and the intension $\mathbb{I}$ of $\mathcal{C}$ is defined as the set of properties, qualities, characteristics or attributes a 'thing' must have (and/or must *not* have) for $\mathcal{C}$ to apply (see also § 2.2.3), meaning $\mathcal{M}$ can be defined as:

D2.6 $\mathcal{M} =_{def.} \langle \mathcal{E},\mathbb{I},\mathbb{W} \rangle$,

in which $\mathbb{W}$ is the set of weights of the elements of $\mathbb{I}$ and both are ordered sets, such that:

D2.6a $\forall i \, [\, i \in \mathbb{I} \leftrightarrow \exists w \, [\, w \in \mathbb{W} \wedge \mathit{weighs}(w,i) \wedge 0 \leq w \leq 1] \,]$,

in which the two-place predicate *weighs* means that w is the weight of i (in other words: each element of the intension $\mathbb{I}$ has a weight w and $\mathbb{W}$ is the set of these weights, such that $\mathbb{I}=\langle i_1,i_2,\ldots i_n \rangle$ and $\mathbb{W}=\langle w_1,w_2,\ldots w_n \rangle$ in which w_1 is the weight of i_1, w_2 is the weight of i_2, etc.) (Note that it could be argued that the intension of a concept is $\langle \mathbb{I},\mathbb{W} \rangle$ rather than $\mathbb{I}$, which would suggest to write D2.6 as $\mathcal{M} =_{def.} \langle \mathcal{E},\langle \mathbb{I},\mathbb{W} \rangle \rangle$, but for the argument presented here this, however, bears little relevance.);
and in which $\mathcal{E}$ is a (mathematical) function that specifies how $\mathbb{I}$ and $\mathbb{W}$ (or $\langle \mathbb{I},\mathbb{W} \rangle$) determine (-s) the extent or degree to which a concept $\mathcal{C}$ is applicable to an object x (which is the same as the extent or degree to which an object x is a member of the extension $\mathbb{E}$ of $\mathcal{C}$), which can be 1 ($\mathcal{C}$ applies) or 0 ($\mathcal{C}$ does not apply) in the case of classical concepts or anything in between in the case of prototypical concepts (see § 2.2.3). $\mathcal{E}$ and $\mathbb{W}$ can be accommodated to define the meaning of both these types of concepts. The general form of $\mathcal{E}$ is:

D2.6b $\mathcal{E} =_{def.} \mathcal{F}\left(\dfrac{\sum\limits_{i \in \mathbb{I} \wedge i(x)} w_i}{\sum\limits_{i \in \mathbb{I}} w_i} \right)$, such that: $0 \leq \mathcal{E} \leq 1$,

in which $\Sigma/i\in\mathbb{I}\wedge i(x)\ w_i$ (the numerator) is the sum of the weights w of the elements of the intension $\mathbb{I}$ that are also properties of the object x (i(x)) and hence, the fraction between the parentheses – here further abbreviated "ξ" – measures the extent to which $\mathbb{I}$ and the set of properties of x overlap. In the case of classical concepts, all weights w (elements of $\mathbb{W}$) are 1 and the function $\mathcal{F}(\xi)$ returns either 1 if ξ = 1 and 0 otherwise. In the case of prototypical concepts, weights w have values between 0 and 1 and $\mathcal{F}(\xi)$ can return any value between 0 and 1, but there may be a threshold that determines that $\mathcal{F}(\xi) = 1$ iff ξ ≥ threshold and $\mathcal{F}(\xi)$ = 0 otherwise.
To summarise D2.6 to D2.6b as briefly as possible: *the meaning of a concept is a set of conditions and rules (based on weighted properties) a 'thing' must conform to, to be an instantiation of that concept*. Properties, however, are concepts themselves. Hence, meaning is a set of concepts and relationships (weights, functions, etc,) between these concepts and their (potential) instantiations:

D2.7 $\quad \mathcal{M} =_{\text{def.}} \langle \mathbb{C}_M, \mathbb{R}_M \rangle$.

The main problem with this (kind of) definition (D2.6 to D2.6b especially) is that it is based on a rather atomistic notion of properties. Like most (possibly all) other concepts, property concepts are often (if not always) fuzzy, ambiguous and/or contested. Moreover, concrete 'things' have *infinitely* many properties that can be *infinitely* divided in more specific or more detailed properties. There is no rock bottom: there are no *final*, *primitive* or *given* properties (see also Sellars 1963 and §2.2.2).
If properties, either as attributes of a particular 'thing' or as elements of an intension of a concept, are unclearly bounded and defined, it is impossible to (unambiguously) specify $\mathbb{P}x$, $\mathbb{I}$, $\mathbb{W}$, $\mathbb{C}_M$ or $\mathbb{R}_M$ which would make the above impossible to apply. At least it would make it impossible to specify $\langle \mathbb{C}_M, \mathbb{R}_M \rangle$ *completely and (completely) unambiguously*. Therefore, any specification of $\langle \mathbb{C}_M, \mathbb{R}_M \rangle$ is contingent upon the set of concepts that makes up the language and the world (see § 2.1.1) of the analyst. Nevertheless, these contingent specifications may – to some extent – clarify the concept if the specifications are at least less ambiguous than the concept analysed itself (see § 2.2.3 on 'ontological relativity').

The meaning triangles and Jackendoff's definition do not offer the only possible description of the elements of a concept. Most descriptions, however, more or less coincide with the $\langle \mathcal{T}, \mathcal{M} \rangle$ interpretation or add a single element. Subsection 2.4.2 describes the most important exception. Management fashion research, hardly influenced by linguistics and philosophies of language, studies management fashions or management concepts, which can be interpreted as (ordered) triplets of 'pure concept' $\mathcal{C}^*$, 'systemic context' $\mathcal{X}$ and 'temporal context' $\mathcal{H}$:

D2.3$_R$ $\quad MF =_{\text{def.}} \langle \mathcal{C}^*, \mathcal{X}, \mathcal{H} \rangle$.

The 'pure concept' is rather similar to $\mathcal{C}$ as defined above and is composed of the label or term $\mathcal{T}$ of the management fashion and the practices labelled thereby, which could be interpreted as its meaning $\mathcal{M}$. As management fashions are normative rather than descriptive concepts, they refer to what should be, not to what is. Nevertheless, D2.6 to D2.6b are applicable here, provided that the extension referred to is a (set of) theoretical (or hypothetical) prototype(s). Hence, $\mathcal{C}^*$ is $\langle\mathcal{T},\mathcal{M}\rangle$ and, as subsection 2.4.2 claimed that what is true of management fashions is true of concepts in general, combining D2.1* and D2.3 results in:

D2.4*$_R$ $\mathcal{C} =_{def.} \langle\mathcal{T},\mathcal{M},\mathcal{X},\mathcal{H}\rangle$.

The temporal context $\mathcal{H}$ of a concept $\mathcal{C}$ is its conceptual history (see § 2.4). $\mathcal{H}$ consists of the (ordered) set of semasiologically (same term, different meanings) and onomasiologically (different terms, similar meanings) interrelated concepts $\mathbb{C}_H$ that $\mathcal{C}$ belongs to ($\mathcal{C}\in\mathbb{C}_H$); and the (ordered) set of relations between these interrelated concepts $\mathbb{R}_H$:

D2.8 $\mathcal{H} =_{def.} \langle\mathbb{C}_H,\mathbb{R}_H\rangle$,

which means, that $\mathcal{H}$ should be interpreted as a (system of) interrelated chronological chain(s) of concepts $\langle\mathcal{C}_1,\mathcal{C}_2,\ldots,\mathcal{C}_n\rangle$ with different meanings $\langle\mathcal{M}_1,\mathcal{M}_2,\ldots,\mathcal{M}_n\rangle$, different systemic contexts and different terms, ultimately leading to $\mathcal{C}$ itself.

The systemic context $\mathcal{X}$ of a concept $\mathcal{C}$ is the 'system' of theories, languages, terminologies and/or language games (etc.) it is used in and/or refers to (see §§ 2.2 to 2.4 and § 2.6), the binary oppositions it is part of (see § 2.5), and the (social) groups it is used by (see § 2.2). $\mathcal{X}$ is rather similar to $\mathcal{H}$, in the sense that $\mathcal{X}$, like $\mathcal{H}$, specifies a set of related concepts $\langle\mathcal{C}_1,\mathcal{C}_2,\ldots,\mathcal{C}_n\rangle$; however, $\mathcal{X}$ also specifies the theoretical, ontological and socio-cultural context of $\mathcal{C}$. Hence, $\mathcal{X}$ consists of two parts: (1) the *terminological context*, the set $\mathcal{S}$ of concepts related to $\mathcal{C}$ such as synonyms, homonyms and other onomasiologically or semasiologically similar concepts, and (2) the *theoretical, ontological, (socio-)linguistic and/or socio-cultural context* $\mathcal{O}$ in which $\mathcal{C}$ itself is used (or which $\mathcal{C}$ is part of). Substituting $\mathcal{O}$ and $\mathcal{S}$ for $\mathcal{X}$ in D2.5* then results in:

D2.5$_R$ $\mathcal{C} =_{def.} \langle\mathcal{T},\mathcal{M},\mathcal{O},\mathcal{S},\mathcal{H}\rangle$,

in which the terminological context $\mathcal{S}$ can be defined, similarly to D2.7 and D2.8, as

D2.9 $\mathcal{S} =_{def.} \langle\mathbb{C}_S,\mathbb{R}_S\rangle$,

in which $\mathbb{C}_S$ is the (ordered) set of onomasiologically and semasiologically related concepts $\mathcal{C}$ belongs to ($\mathcal{C} \in \mathbb{C}_S$); and $\mathbb{R}_S$ is the (ordered) set of relations between these concepts. If some older forms of concepts are still in use, which is generally the case, $\mathbb{C}_S$ and $\mathbb{C}_H$ overlap considerably. $\mathbb{C}_H$ and $\mathbb{C}_S$ both specify sets of onomasiologically and semasiologically related concepts including $\mathcal{C}$ itself. An important difference (besides the fact $\mathbb{C}_H$ and $\mathbb{C}_S$ merely overlap and do not generally coincide) between $\mathcal{H}$ and $\mathcal{S}$ is that in the former concepts (the elements of $\mathbb{C}_H$) are ordered (related) historically or evolutionary, while there is no 'natural' order of the elements of $\mathbb{C}_S$.

$\mathcal{O}$ refers to the context in which $\mathcal{C}$ is used. $\mathcal{O}$ can refer to a theory; a conceptual framework, ontology or language; a (conceptual) dialectic or dichotomy; a scientific community; a socio-cultural group; or a combination of any of these. Conceptual frameworks, ontologies, languages, theories, etc. can all be interpreted as sets of concepts and relationships between these concepts: $\langle \mathbb{C}_O, \mathbb{R}_O \rangle$. And if the defining characteristics of a group, disregarding the fact whether it is a socio-cultural group or a scientific community, is its language or conceptual framework, as is suggested by, for example, Winch (and others; see § 2.2.2), these can be defined as $\langle \mathbb{C}_O, \mathbb{R}_O \rangle$ as well. Therefore, ontological and (socio-) linguistic context $\mathcal{O}$ is a set of concepts and relationships $\langle \mathbb{C}_O, \mathbb{R}_O \rangle$. However, these ordered couples $\langle \mathbb{C}_O, \mathbb{R}_O \rangle$ (languages, theories, socio-cultural groups, etc.) generally have names or labels, or could be labelled at least. A *complete* definition of $\mathcal{O}$ then would be a triplet:

D2.10 $\mathcal{O} =_{def.} \langle \mathcal{L}, \mathbb{C}_O, \mathbb{R}_O \rangle$,

in which $\mathcal{L}$ is the name or label of the language, theory, language-game, socio-cultural group, scientific community, etc. that $\mathcal{O}$ refers to (or in other words, $\mathcal{C}$ is used in). Like $\mathbb{C}_H$ and $\mathbb{C}_S$, $\mathbb{C}_O$ includes $\mathcal{C}$ ($\mathcal{C} \in \mathbb{C}_O$). However, the other elements of $\mathbb{C}_O$ specify the other concepts used in the same ontological and/or (socio-)linguistic context. Hence, contrary to the elements of $\mathbb{C}_H$ and $\mathbb{C}_S$, the elements of $\mathbb{C}_O$ are not related onomasiologically or semasiologically, but by the fact that they are used in the same ontology or language or by the same social group. In practice, specifying all of the concepts, all the elements of $\mathbb{C}_O$ is not very useful. It is generally only the label $\mathcal{L}$ that CA is interested in. A full specification of a language or theory that $\mathcal{C}$ is part of would be a painstaking effort that would add little to the analysis. Hence an analysis of $\mathcal{O}$ is generally limited to the specification of $\mathcal{L}$. (However, if $\mathcal{L}$ is relatively unknown, a short description of $\mathcal{O}$ may be necessary.)
Inserting D2.7 tot D2.10 results in:

D2.5a $\mathcal{C} =_{def.} \langle \mathcal{T}, \langle \mathbb{C}_M, \mathbb{R}_M \rangle, \langle \mathcal{L}, \mathbb{C}_O, \mathbb{R}_O \rangle, \langle \mathbb{C}_S, \mathbb{R}_S \rangle, \langle \mathbb{C}_H, \mathbb{R}_H \rangle \rangle$,

which shows that a concept is a set of sets (of sets) of (other) concepts and relationships therebetween. CA, therefore, is translation of the concept to be analysed in sets of further concepts (see also § 2.2.1). This set theoretical definition of concepts implies that two

concepts are the same concept only if these sets coincide; hence, if all elements (of the elements) of $\mathcal{C}_1$ and $\mathcal{C}_2$ are (completely) identical:

T2.3 $\forall \mathcal{C}_1,\mathcal{C}_2 \; [\; \mathcal{C}_1 = \mathcal{C}_2 \leftrightarrow \forall x \; [\; \varepsilon(x,\mathcal{C}_1) \leftrightarrow \varepsilon(x,\mathcal{C}_2)] \;]$,

in which $\varepsilon(x,\mathcal{C})$ means that x is an element or value (of an element) of an element of $\mathcal{C}$. T2.3 implies that, for example, $\mathcal{C}_1$ and $\mathcal{C}_2$ with the same term and the same meaning but used by different social groups are different concepts. Moreover:

T2.4 for all two natural language concepts $\mathcal{C}_1$ and $\mathcal{C}_2$:
$\forall x \; [\; (\; \varepsilon(x,\mathcal{C}_1) \wedge \neg\varepsilon(x,\mathcal{C}_2) \;) \rightarrow \exists y \; [\; y \neq x \wedge \varepsilon(y,\mathcal{C}_1) \wedge \neg\varepsilon(y,\mathcal{C}_2) \;] \;]$,

which can be summarised in ordinary language as 'differences never come alone'. For any two concepts that differ in *any* respect, there is at least one more difference between the two. Even in the case of synonyms the difference is not limited to distinctive terms or labels. The two variants have different conceptual histories and different connotations and are used in different contexts. (Note that, while all other formulas presented above are analytical statements, T2.4 is, although obvious, not analytical, but an empirically testable hypothesis.)
D2.5a and T2.4 reconfirm Quine's conclusion that concepts derive their meaning from the theoretical and socio-linguistic setting they are used in and that the unit of analysis is a language as a whole rather than a single concept (see § 2.2.1). As Sartori asserted, this is 'outrageously unhelpful advice' (see § 2.3), however. Nevertheless, the model developed here can be used as a framework for actual CA, as will be shown in the next subsection.

2 / 7 / 2 / application of the model

Unfortunately, application of the model presented above in CA in social and/or political science is far less exact or rigorous than the formal model may suggest. CA is not an exact science, but the application of this model may provide some structure to it at least. The model suggests some rules for CA, which can be summarised in a two-stage methodology. The first stage is the *mapping stage*; the second is the *reconstruction stage*. The mapping stage aims at the description of the elements (of the elements) of the analysandum; it is the goal of the reconstruction stage to provide translations rules or definitions depending on the type of concept(s) to be analysed.
CA obviously starts with the identification of the analysandum $\mathcal{A}$, the concept or concepts $\mathcal{C}$ to be analysed. CA does not have to be an analysis of a single concept, but if sets of concepts are analysed, one has to be clear about how the concepts in this set are related and why the set has to be analysed as a whole. Hence, the analysandum $\mathcal{A}$ is a set of first-level concepts $\mathbb{C}_A$ and relationships $\mathbb{R}_A$:

D2.11 $\mathcal{A} =_{\text{def.}} \langle \mathbb{C}_A, \mathbb{R}_A \rangle$,

If the analysandum is a single concept, $\mathcal{A}$ is a singleton $\langle \mathcal{C} \rangle$; if for example, a binary opposition is analysed (see § 2.5), $\mathcal{A}$ is a set $\langle\langle \mathcal{C}_1, \mathcal{C}_2 \rangle, R_{bin.op.} \rangle$. As concepts in binary oppositions have a history as a pair and (partly) derive their meaning from the opposition, analysis of the pair is generally preferable to analysis of only one of its elements. It is important to note that in many cases the relationship between $\mathcal{C}_1$ and $\mathcal{C}_2$ contains more information than the bare fact that they are part of a binary opposition (or some other kind of linguistic framework). In these cases, the relationship itself may be a third concept. If, for example, $\mathcal{C}_1$ and $\mathcal{C}_2$ are binary opposed concepts referring to events that are causally related such that a $\mathcal{C}_1$-event causes a $\mathcal{C}_2$-event, the relationship between $\mathcal{C}_1$ and $\mathcal{C}_2$ consists of three parts: $R_{bin.op.}$, their relationship within a theory about the causal relationship R_{theory}, and the concept of "causation". Hence, $\mathcal{A} = \langle\langle \mathcal{C}_1, \mathcal{C}_2, \text{"causation"} \rangle, \langle R_{bin.op.}, R_{theory} \rangle\rangle$.
In case of the CED, the two labels of $\mathcal{C}_1$ and $\mathcal{C}_2$ are clear as they are implied in the term "culture - economy dialectic". The term "dialectic" refers to the binary opposition between these terms, but does not unambiguously specify the (theoretical) relationships between the referents of $\mathcal{C}_1$ and $\mathcal{C}_2$. Hence:

D2.12 $\mathcal{A}_{CED} = \langle\langle \text{"culture"}, \text{"economy"}, \mathcal{C}_{relation} \rangle, \langle R_{bin.op.}, R_{theory} \rangle\rangle$,

in which $R_{bin.op.}$ links "culture" and "economy" directly, and R_{theory} links "culture" and "economy" to the intermediate $\mathcal{C}_{relation}$.

After identification of the analysandum, the analysans is described in the mapping stage. The mapping stage gives a complete overview of what different versions and variants of the concept do and did mean and by whom they are and were used in what contexts. It provides a 'map' of the *conceptual field*, the field of (possible) meanings and/or referents of the different versions and varieties of the concept. The mapping stage reveals its regions (concepts and clusters thereof) and roads (relationships between concepts).
D5(a) and D2.7 to D2.10 imply that concepts have to be analysed as members of sets of interrelated (and usually overlapping) concepts ($\mathbb{C}_M$, $\mathbb{C}_H$, $\mathbb{C}_S$ and $\mathbb{C}_O$) as is summarised in table 2.3. However, all of these members are concepts themselves and are, therefore, themselves elements of (further) sets $\mathbb{C}_M$, $\mathbb{C}_H$, $\mathbb{C}_S$ and $\mathbb{C}_O$ that (may) overlap with $\mathbb{C}_M$, $\mathbb{C}_H$, $\mathbb{C}_S$ or $\mathbb{C}_O$ of the initial $\mathcal{C}$, but do not necessarily coincide. Hence, in CA practice, a number of levels in the analysis should be distinguished. *First-level analysis* is the specification of $\langle \mathcal{T}, \mathcal{M}, \mathcal{O}, \mathcal{S}, \mathcal{H} \rangle$ of the initial $\mathcal{C}$, the *first-level concept*; *second-level analysis* is the specification of $\langle \mathcal{T}, \mathcal{M}, \mathcal{O}, \mathcal{S}, \mathcal{H} \rangle$ of the *second-level concepts*, all the other elements of the sets $\mathbb{C}_M$, $\mathbb{C}_H$, $\mathbb{C}_S$ and $\mathbb{C}_O$, specified as parts of the $\mathcal{M}$, $\mathcal{H}$, $\mathcal{S}$ and $\mathcal{O}$ of the initial $\mathcal{C}$; and so on. Although in theory the number of levels is infinite, in practice we are not very much interested in these higher-level analyses. Generally, CA can be limited to the specification of $\langle \mathcal{T}, \mathcal{M}, \mathcal{O}, \mathcal{S}, \mathcal{H} \rangle$ of the first level concept and $\langle \mathcal{T}, \mathcal{M}, \mathcal{O} \rangle$ of the second-level concepts.

In practice, this means that CA is the specification of a set of second level concepts (or in fact four of these sets: $\mathbb{C}_M$, $\mathbb{C}_H$, $\mathbb{C}_S$ and $\mathbb{C}_O$) and the $\mathcal{T}$s, $\mathcal{M}$s and $\mathcal{O}$s of these concepts. (Note that determining $\mathcal{L}$ is usually sufficient in the specification of $\mathcal{O}$.)

table 2.3: *conceptual analysis as the specification of conceptual elements*

analysandum		analysans (specification of …)	
$\mathcal{T}$	term, label		(*none*)
$\mathcal{M}$	meaning	$\langle \mathbb{C}_M, \mathbb{R}_M \rangle$	intension, essential properties, etc.
$\mathcal{O}$	ontological and (socio-) linguistic context	$\langle \mathcal{L}, \mathbb{C}_O, \mathbb{R}_O \rangle$	(labels or names of) contexts of use, language game(s), language(s), etc.
$\mathcal{S}$	terminological context	$\langle \mathbb{C}_S, \mathbb{R}_S \rangle$	synonyms, homonyms, similar concepts, etc.
$\mathcal{H}$	historical context	$\langle \mathbb{C}_H, \mathbb{R}_H \rangle$.	earlier versions and variants

Because $\mathcal{C}$ is an element of $\mathbb{C}_H$ and $\mathbb{C}_S$ and $\mathcal{O}$ specifies the (socio-)linguistic and ontological contexts the elements of $\mathbb{C}_H$ and $\mathbb{C}_S$ are used in, specification of the different elements of $\mathcal{C}$ will result in considerable redundancy: the same concepts will show up over and over again (as elements (of elements) of $\mathbb{C}_H$, $\mathbb{C}_S$ and $\mathbb{C}_O$). If a specification of $\mathcal{L}$ is sufficient to describe $\mathcal{O}$, the specification of the $\mathcal{T}$s, $\mathcal{M}$s and $\mathcal{L}$s of the elements of $\mathbb{C}_H$ and $\mathbb{C}_S$ will include all elements of elements of $\mathcal{C}$, with only limited redundancy and in a more systematic framework (see table 2.4). CA then consists of *historical* and *intensional mapping*: the specification and analysis of $\mathcal{H}$ and $\mathcal{S}$ respectively. Both mappings specify sets of concepts, the meanings and contexts thereof and the relationships therebetween, but the historical mapping aims at explaining the origins and evolution of the concept, while the intensional mapping is intended to clarify the differences in meaning and use of the concept and related concepts.

table 2.4: *the mapping stage*

	historical mapping	intensional mapping
	$\mathcal{H}$	$\mathcal{S}$
$\mathbb{C}$	$\mathbb{C}_H = \langle \mathcal{C}_{H1}, \mathcal{C}_{H2}, \ldots, \mathcal{C}_{Hn} \rangle$	$\mathbb{C}_S = \langle \mathcal{C}_{S1}, \mathcal{C}_{S2}, \ldots, \mathcal{C}_{Sn} \rangle$
$\mathbb{R}$	$\mathbb{R}_H$	$\mathbb{R}_S$
$\mathcal{T}$	$\langle \mathcal{T}_{H1}, \mathcal{T}_{H2}, \ldots, \mathcal{T}_{Hn} \rangle$	$\langle \mathcal{T}_{S1}, \mathcal{T}_{S2}, \ldots, \mathcal{T}_{Sn} \rangle$
$\mathcal{M}$	$\langle \mathcal{M}_{H1}, \mathcal{M}_{H2}, \ldots, \mathcal{M}_{Hn} \rangle$	$\langle \mathcal{M}_{S1}, \mathcal{M}_{S2}, \ldots, \mathcal{M}_{Sn} \rangle$
$\mathcal{L}$	$\langle \mathcal{L}_{H1}, \mathcal{L}_{H2}, \ldots, \mathcal{L}_{Hn} \rangle$	$\langle \mathcal{L}_{S1}, \mathcal{L}_{S2}, \ldots, \mathcal{L}_{Sn} \rangle$

If the internal structure of a concept is – more or less – holistic as implied by T2.4, there does not seem to be a natural order in the specification (or analysis) of the elements of a concept and therefore, in the order of historical and intensional mapping. Any change results in other changes; all aspects of the concepts are somehow (either directly or indirectly) connected. Although T2.4 does not say anything about the kinds of relationships

that determine the holistic nature of the internal structure of a concept, generally one could claim that all of the elements of $\mathcal{C}$ determine each other. There is an element, however, that far more strongly determines the others than they determine it. This is the conceptual history $\mathcal{H}$. Difference in term $\mathcal{T}$ or meaning $\mathcal{M}$ cannot cause difference in *past* history, but *past* history can and does co-determine the other elements of $\mathcal{C}$. This suggests, that CA as specification of the elements of $\mathcal{C}$ should start with the specification of $\mathcal{H}$, hence with historical mapping.
Historical mapping is chronological; intensional mapping has no 'natural' order but should reflect the intensional structure of the concept. This intensional structure is basically a map of the different clusters of concepts that are more similar to each other than to other clusters. Intensional structure can be mapped by means of cluster analysis or Formal Concept Analysis (see § 2.6.2). These techniques can be used to cluster (order) the elements of $\mathbb{C}_S$ by their properties. For example, the elements of $\mathbb{C}_S$ could be clustered by the concepts used in their definitions (the elements of $\mathbb{C}_M$ of the elements of $\mathbb{C}_S$), or by their ontological or (socio-)linguistic context (the $\mathcal{L}$s of the elements of $\mathbb{C}_S$) or (preferably) both. The result of such analyses would be a map showing which concepts (elements of $\mathbb{C}_S$) are more similar in meaning and which are more different and in which contexts all of these concepts are used.

In the second stage, that of *reconstruction*, the set(s) of interrelated concepts that was (were) the result of the mapping stage is (are) the starting point(s). The central question in the reconstruction stage is what measures could and should be taken to minimise confusion and ambiguity in the use of the terms in the mappings. However, 'minimising confusion and ambiguity' does *not* necessarily mean 'providing a single definition'. In many cases, for example when the analysandum is an 'essentially contested concept' (see § 2.4), the goal of reconstruction is to supply the *translation rules* necessary to compare the different versions of the concept and (in this way) to enable (more) reasonable communication between the (social) groups and theories using these different versions. For example, in case a single term $\mathcal{T}$ is used for multiple meanings in a single context $\mathcal{O}$, it is generally advisable to introduce new terms. On the other hand, in case multiple terms $\mathcal{T}$ denote the same meaning in a single context $\mathcal{O}$, it might be better to choose one term. In summary: conceptual reconstruction is the re-categorisation of the 'conceptual field'.
Conceptual reconstruction, as intended here, deviates strongly from standard practice in social science. 'The coining of *new terms* for new concepts is (…) considered, by most social scientists, to be pretentious and to be a sign of unseemly egotism on the part of the innovator' (Riggs 1981, p. 13). Nevertheless, concept reconstruction may provide (part of) a more rigorous ontology for a scientific field, a more stable foundation for building new theories, and a common language for comparing and evaluating current and earlier theories in the field.

2 / 7 / 3 / the analysis of the CED

In the following chapters, the method proposed here will be applied to the (concepts of the) culture - economy dialectic (CED). The ultimate objective of the analysis of the CED is to compare, evaluate and integrate its different theories and variants. Because of the nature of the CED as a set of very different theories from very different (philosophical, conceptual, etc.) backgrounds, the goal of CA in this study is not to provide final definitions of "culture", "economy" and the relationship therebetween (which would be neither possible nor very useful), but to provide a common language to enable translation, comparison and integration of the many theories of the CED.
The basic form of the CED is that *there is some kind of cultural phenomenon that is somehow related to some kind of economic phenomenon*. Hence, the object of analysis was identified above as:

D2.12$_{\mathrm{R}}$ $\mathcal{A}_{CED} = \langle\langle$"culture","economy",$\mathcal{C}_{relation}\rangle,\langle \mathrm{R}_{bin.op.},\mathrm{R}_{theory}\rangle\rangle$.

It is nearly impossible to analyse elements of $\mathcal{C}_{CED}$ in isolation. However, an analysis of $\mathcal{C}_{relation}$ demands at least some clarity on the concepts of "culture" and "economy". Hence, it seems obvious to focus on "culture" and "economy" before dealing in depth with the relationship(s) therebetween. Moreover, $\mathcal{C}_{relation}$ may be the most complicated element of $\mathbb{C}_{\mathrm{C}}$ as it refers to complex theories of social phenomena. Chapters 3 to 5 deal with the mapping stage and the reconstruction stage in the analysis of $\mathcal{H}$ and $\mathcal{S}$ of "culture" and "economy". Chapter 6 focuses on operationalisation and measurement of the reconstructed concepts. The main objective of this research project, however, is not the analysis of these concepts, but of their relationship, both the relationships between the concepts, $\mathbb{R}_{\mathrm{C}}$, and the relationships between the referents of the concepts, $\mathcal{C}_{relation}$. Both will be dealt with briefly in chapters 3 and 5, but will be put centre ground in chapter 7. Chapter 8, finally, will review the results of the analysis and attempt to assess the relevance of these results to social science.