5 Personal views on the incommensurability discussion

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Bibliography
Introduction

During my time studying Artificial Intelligence,\textsuperscript{1} which consists of subjects such as linguistics, philosophy and logic, I often encountered discussions about subjects like ‘truth’ and ‘meaning’, skeptical arguments like the ‘brain in a vat’ hypothesis and other such philosophical subjects.

AI is a field of research that is ultimately founded on philosophical and mathematical ideas that were developed by the ancient Greek philosophers, but particularly after the 17\textsuperscript{th} century, in which the mechanistic worldviews of Francis Bacon and René Descartes dominated science. Although Descartes thought mankind was different from all other species in that it had ‘mental attributes’ and a consciousness, it was the idea of a mechanistic world that inspired later scientists to try and copy both animal and human behaviour. In AI, the ultimate goal of this venture became to create human consciousness. Because of the philosophical roots of AI, it is not very surprising that at the University of Utrecht, Artificial Intelligence is taught at the faculty of philosophy.

A lot of the recent philosophical subjects related to AI are about language and meaning. In this thesis I will focus on one such philosophical subject, namely the subject of \textit{incommensurability}. The incommensurability thesis was independently introduced by Thomas Kuhn and Paul Feyerabend in the 1960’s, and had quite an impact on modern philosophy. Due to its controversial nature, it has been one of the philosophical subjects most written about during the past 40 years. Since Kuhn and Feyerabend have a considerable difference of opinion on the subject, and since Kuhn’s ‘Structure of Scientific Revolutions’ was one of the most influential books in the philosophy and history of science of the twentieth century (it has been translated into twenty-five languages and the English edition alone sold over a million copies), I will focus on Thomas Kuhn’s incommensurability thesis. In his early works Kuhn proposed many forms of incommensurability. Because semantic incommensurability is the most interesting of these and most relevant to the study of linguistics and logic, and since it was the only version of incommensurability that Kuhn wrote about until his death in 1996, this will be the main subject of my thesis.

Although the subject of incommensurability might not appear to be a typical subject for AI, it is quite astonishing that a lot of the major scientists and philosophers involved in AI’s history and foundations have had something relevant to say on the matter. Prominent AI authors, who also play a significant role in the incommensurability discussion include people like Frege, Tarski, Wittgen-

\textsuperscript{1} CKI; Cognitieve Kunstmatige Intelligentie, faculteit wijsbegeerte, Universiteit Utrecht.
stein, Kripke, Quine, Davidson and Putnam. Most of these authors also played important (or even decisive) roles in the development of Logic, the philosophy of language or the philosophy of mind.

Because it was first introduced in Kuhn’s *Structure* (which mainly deals with scientific revolutions), incommensurability is a subject that is normally considered to be a topic of the realism debate and thus as a topic of the philosophy of science. However, the subject is much broader than that. The discussion of semantic incommensurability is about the meaning of terms and expressions, and therefore, about communication. The incommensurability discussion also involves disciplines such as the philosophy of language, linguistics and semantics, mathematics and logic, philosophy of mind and epistemology.

Incommensurability is a subject that is encountered by most students in a course on the philosophy of science, although often it is not explained in very much detail. This is probably because the incommensurability thesis is quite complex and there is a lot of difference in opinion on what the term ‘incommensurability’ means exactly. The reason for this is probably that it has two proponents, namely Kuhn and Feyerabend, who differ in opinion on the subject. If we focus on the ideas of one of them, we will see that the thesis is subject to change over the years.

In this thesis I will provide an overview of the main theories and arguments that make up the incommensurability discussion. This will include all the versions and adjustments of Kuhn’s incommensurability thesis over the years and the arguments delivered by Kuhn’s main opponents, Davidson, Kripke and Putnam, as well as comments by some authors of secondary texts. Indirectly, this thesis will provide an answer to the question of what Kuhn’s version of the incommensurability thesis embodies, and thus, what the term ‘incommensurability’ means.

In the first chapter I will provide an overview of the initial thesis as proposed by Kuhn in ‘the Structure of Scientific Revolutions’ which was published in 1962. I will also provide a short history of referential semantics to explain how the linguistic basis for the refined version of the incommensurability thesis was formed. In the second chapter I will explain the criticism on the thesis that was given by Donald Davidson, some counter-criticism and Kuhn’s response to this. In the third chapter I will explain the argument delivered against incommensurability by Saul Kripke and Hilary Putnam called the ‘causal theory of reference’. In the fourth chapter I will look at the development of Kuhn’s position from after the criticism of Davidson and Kripke and Putnam, up until the end of his life (in 1996). In the concluding chapter, I will explain my own views on the discussion.

\[2\text{Kuhn (1962)}\]
Chapter 1

Incommensurability: the initial theory (1962)

Kuhn’s first important publication regarding the philosophy of science is his famous ‘The Structure of Scientific Revolutions’ (1962). In his ‘Structure’ Kuhn explains what a paradigm is and how a paradigm is replaced by another paradigm in a scientific revolution. With his views Kuhn posed a threat to the position that science is cumulative, the idea that science produces more and more truths about the world. A paradigm, according to Kuhn, is a way of viewing the world that is taken for granted by the scientific community. When scientists fail to solve certain puzzles defined by a paradigm, scientists lose their confidence in this paradigm, and the paradigm is replaced by a new one in a so called paradigm-shift. This entire process can be termed a scientific revolution. The new paradigm is able to solve the puzzles the old paradigm could not, and the scientific community therefore converts to it (or in some cases the older generation of scientists simply dies out). Once the new paradigm becomes accepted and the revolution ends, we get a state that Kuhn calls ‘normal-science’.

The problem raised by Kuhn’s theory is that new paradigms can only be called different from the old ones, and not necessarily closer to the truth in general. Although a new paradigm may solve puzzles that the old paradigm could not, solutions the older paradigm offered may well be disregarded because of a disinterest, fashion or whatever. This theory of scientific revolutions seems a threat to scientific realism. It was certainly treated as such by many scientists and philosophers.

Another threat to scientific realism, and a theory that got less attention in the Structure than the theory of scientific revolutions, but which received increasing attention in Kuhn’s later works, is the incommensurability thesis. Kuhn claims that successive paradigms or rival theories from these successive paradigms are incommensurable.

\(^{1}\text{Kuhn (1962)}\)
“The normal-scientific tradition that emerges from a scientific revolution is not only incompatible but often actually incommensurable with that which has gone before.”

The term ‘incommensurability’ was independently adopted by both Kuhn and Feyerabend from mathematics, where it was first used. In mathematics the term ‘incommensurability’ means ‘lack of common measure’. This term was already used by the ancient Greeks to denote irrational numbers they encountered. In his ‘Elements’ Euclid proved that $\sqrt{2}$ cannot be expressed as a rational number. Because there is no common measure in which to express both, irrational numbers are called incommensurable with rational numbers. This does not mean two magnitudes cannot be compared. They can for example be compared using approximation ($\sqrt{2}$ is approximately 1.4142). A typical example of mathematical incommensurability used by Kuhn is that the hypotenuse of an isosceles right triangle is incommensurable with its side, but the two can be compared to any required degree of precision. What is lacking is not comparability, but a unit of length in terms of which both can be measured directly and exactly.

The idea that scientific theories or paradigms could also be called incommensurable emerged from Kuhn’s attempts to understand apparently nonsensical passages from old scientific texts. These passages were not simply evidence of mistaken beliefs, but Kuhn suggested these old texts were being misread by modern scientists (namely, from the perspective of the current paradigm). Modern scientists reading these texts should have recovered the meanings of the terms involved, as they were when they were written (from the perspective of their contemporary paradigm). Kuhn used his concept of paradigms and applied to it the metaphor of mathematical incommensurability. He concluded that rival theories can be called incommensurable on the same ground that mathematical entities can. Because of their different theoretical framework, rival theories can have no common measure.

“Since new paradigms are born from old ones, they ordinarily incorporate much of the vocabulary and apparatus, both conceptual and manipulative, that the traditional paradigm had previously employed. But they seldom employ these borrowed elements in quite the traditional way. Within the new paradigm, old terms, concepts, and experiments fall into new relationships one with the other. The inevitable result is what we must call, though the term is not quite right, a misunderstanding between the two competing schools.”

Paradigms are to be seen as holistic networks, in which the meanings and use of the vocabulary and apparatus depend on their theoretical framework. Proponents of competing paradigms must thus fail to make complete contact with each other’s viewpoints and communication across the revolutionary divide is therefore inevitably partial. In the worst case scenario there might not even be any communication at all. Take for example Copernicus’ opponents (the people who called him mad because he proclaimed the earth moved). For these

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2Kuhn (1962, p. 103)
3Kuhn (1962, p. 149)
4Kuhn (1962, p. 148)
opponents, the meaning of ‘earth’ partially included ‘not moving’ or ‘having a
fixed position’. Copernicus’ opponents viewed the earth as a totally different
concept and thus can in no way be called wrong or mistaken. Without chang-
ing the meaning of ‘earth’ and ‘motion’ Copernicus’ theory of a moving earth
would indeed have been mad. This leads Kuhn to his famous expression that the
proponents of competing paradigms practice their trades in different worlds.\textsuperscript{5}
Kuhn provides us with a large number of striking examples from the history
of science to support his theory. An example of incommensurability in recent
(pre and post-revolutionary) science is both Newton’s and Einstein’s use of the
theoretical concepts ‘force’ and ‘mass’,

\textquote{\ldots the physical referents of these Einsteinian concepts are by
no means identical with those of the Newtonian concepts that bear
the same name. (Newtonian mass is conserved; Einsteinian is con-
vertible with energy. Only at low relative velocities may the two be
measured in the same way, and even then they must not be conceived
to be the same.) \ldots} \textsuperscript{6}

and the \textit{Structure} contains countless other examples:

\textquote{Both Boyle and Lavoisier changed the chemical significance of
‘element’ in important ways. But they did not invent the notion or
even change the verbal formula that serves as its definition. Nor, as
we have seen, did Einstein have to invent or even explicitly redefine
‘space’ and ‘time’ in order to give them new meaning within the
context of his work.} \textsuperscript{7}

At this point in time, Kuhn’s intuition of how to defend his incommensurability
thesis in more philosophical terms, seemed to focus mainly on the absence of
an external point of view or standard for theories. At that time, Western Phi-
losophy’s epistemological viewpoint was that sensory experience was somehow
fixed and neutral, and that theories were simply man-made interpretations of
given data. Kuhn is not entirely willing to relinquish this view (in absence of a
developed alternative), but certainly does not believe in attempts to introduce
a neutral language of observations.\textsuperscript{8}

Furthermore, Kuhn uses examples from Gestalt psychology to support and il-
lustrate his intuitions.

\textquote{Therefore, at times of revolution, when the normal-scientific
tradition changes, the scientist’s perception of his environment must
be re-educated – in some familiar situations he must learn to see
a new gestalt. After he has done so the world of his research will
seem, here and there, incommensurable with the one he had inhab-
ited before. That is another reason why schools guided by different
paradigms are always slightly at cross-purposes.} \textsuperscript{9}

\begin{footnotes}
\item[5]Kuhn (1962, p. 150)
\item[6]Kuhn (1962, p. 102)
\item[7]Kuhn (1962, p. 143)
\item[8]Kuhn (1962, p. 126)
\item[9]Kuhn (1962, p. 112)
\end{footnotes}
We see that the incommensurability thesis is the result of Kuhn’s theory of scientific revolutions and some vague intuitions about meaning and holism. The initial theory of incommensurability in *Structure* was not very well articulated and was far from clear. It is this lack of clarity and the controversial ‘anti-realist’ implications that elicited a lot of discussion and criticism.

After the publication of *Structure* Kuhn became dissatisfied with this early version of the incommensurability thesis, since it soon became the most criticized feature of *Structure* in philosophical literature. Kuhn’s own understanding of the thesis underwent several significant shifts. In the years after the publication of *Structure* Kuhn became more interested in the potential of the theory and because of the amount of criticism started explicating and elaborating his theory.

Kuhn made a distinction between several types of incommensurability (incommensurability of standards, meaning, methodology, etcetera). Because in his later work the semantic aspects of incommensurability became the most important and most interesting of these types, I will only go into the type of incommensurability that deals with meaning. In the following sections I will discuss Kuhn’s elaboration of the linguistic aspects of incommensurability and provide a short background of the theories of meaning.

### 1.1 Incommensurability as a linguistic problem

In the postscript to *Structure* and later works, Kuhn distanced himself from the theories presented in *Structure*, and started focusing on the linguistic and holistic aspects of his incommensurability thesis. Kuhn increasingly started presenting incommensurability as a problem of (natural) language. While Paul Feyerabend at about the same time presented incommensurability as a reason for complete communications breakdown, Kuhn presented a more subtle version of the thesis. Kuhn does not believe in total communications breakdown. Although he thinks communication can be improved when a breakdown occurs, he also thinks we are in a sense fixed to our framework, and that we cannot simply break out of it. The idea that we can break out of our framework is something Karl Popper claimed.\(^\text{10}\)

Kuhn developed his earlier idea that with the shift from one paradigm to the next, the meanings of terms used in earlier theories are different from the meanings of those same terms in the newer theory.

> “In the transition from one theory to the next words change their meanings or conditions of applicability in subtle ways. Though most of the same signs are used before and after a revolution - e.g., force, mass, element, compound, cell – the ways in which some of them attach to nature has somehow changed. Successive theories are thus, we say, incommensurable.”\(^\text{11}\)

The reason for this change of meaning is partially based on the theories that were accepted at that time, and which are still more or less accepted in the field.

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\(^\text{10}\)Popper (1970, p. 56)

\(^\text{11}\)Kuhn (1970, pp. 162–163)
of referential semantics. In the next section I will provide a short history of referential semantics.

“Two men who perceive the same situation differently but nevertheless employ the same vocabulary in its discussion must be using words differently. They speak, that is, from what I have called incommensurable viewpoints.”

The idea is that scientists from two different paradigms see particular experimental or observational situations to which both have recourse in different ways. The vocabularies in which these scientists discuss such situations consist predominantly of the same terms, and therefore scientists from different paradigms must be attaching some of those terms to nature differently. Any communication between these scientists is inevitably only partial. As a result, the superiority of one theory to another is something that cannot be proven in debate. The only thing left for the proponents of a theory is to try and persuade each other.

A communications breakdown which results from incommensurability is not merely linguistic and it cannot be resolved simply by stipulating the definitions of troublesome terms. The words which difficulties cluster around have been learned in part from direct application to exemplars, which are cases that serve as a standard example for the proper application of a theory or of the success of a paradigm (such as solutions to problems). Such an exemplar cannot be seen separately from the paradigm or theory since it forms a model of that theory (it is a part of the theory). Therefore the participants in a communications breakdown cannot say, “I use the word ‘element’ (or ‘mixture’ or ‘planet’ or ‘unconstrained motion’) in ways determined by the following criteria.” They cannot resort to a neutral language which both participants can use in the same way and which is adequate for the statement of both their theories or even of both those theories’ empirical consequences. Part of the difference is prior to the application of the languages in which it is nevertheless reflected.

Kuhn does not think there will always be a total communications breakdown between proponents of rival theories. But when a communications breakdown occurs, there can be no recourse to good reasons in a debate over theory-choice. What the participants in a communications breakdown can do is recognize each other as members of different language communities and then become translators. A theory will therefore not entirely be chosen for reasons that are ultimately personal and subjective.

It has often been assumed that a language is available in which at least the empirical consequences of two successive theories can be translated without any loss or change. Such a language would be able to capture our ‘neutral’ sensations, thus consisting purely of sense-data terms (and some syntax). This idea of having or finding such an ideal language has now been forsaken. Nevertheless there are still many who believe that a basic vocabulary is available that attaches words to nature in an unproblematic and theory-independent way. Kuhn and Feyerabend have claimed that no such observation language is available,
1.1. Incommensurability as a linguistic problem

and that certainly none is shared in its entirety by two theories. Their claim is that words change their meaning with the transition of one theory into the other (while keeping the same signs) because the attachment to nature has somehow changed.

There are several intuitions against this. First of all, people with different views seem to be able to somehow convince each other sometimes. Also, as Karl Popper states, it is a dogma that one can compare different frameworks with different languages; after all even Chinese people can speak English (and we can assume the Chinese have a different framework than the English). Kuhn’s reply to this is that learning another language is not the same as translating, and that full translation is problematic, since often (or even always) one must compromise. Accuracy and felicity of expression cannot be preserved when translating and therefore there is no perfect translation. This means communication, when attempted by people of different speech communities, is always altered. Translation is difficult because different languages cut up the world in different ways. We have no access to a neutral way of communication.

“Part of learning to translate a language or a theory is learning to describe the world with which the language or theory functions.”

We acquire a language and our knowledge about nature at the same time. We encounter words in certain sentences and not in others. This way we learn words from their combination and relation to other words. Learning words from their relationship with each other is purely linguistic. There has to be a vocabulary that is based on a nonverbal process to somehow link these words to the world. The words of this vocabulary are presumably learned by ostension; which is the idea that the meaning of words is learned by the direct matching of these words to their appropriate object, property, relation, etc. in the world (by an act of pointing or some other way of confronting). For example, it is quite plausible that we learn the meaning of ‘red’ by being confronted with different red objects while hearing the word ‘red’.

In his publications towards 1970 Kuhn tended to interpret his incommensurability thesis more from the perspective of linguistics and semantics. The vague metaphors from mathematics and Gestalt psychology, that served as the intuition for the thesis in the Structure, were almost gone. Kuhn even slightly distanced himself from his earlier views on scientific revolutions. For example, he suggested that instead of ‘paradigm’ we should use the term ‘disciplinary matrix’. The term ‘disciplinary’, because the structure Kuhn described is something that is common to the practitioners of a specified discipline, and the term ‘matrix’ because this structure consists of ordered elements which require individual specification. The term ‘paradigm’ was not specific enough according to Kuhn, as it was used for different things shared by communities (solutions to problems, models, values, etc.).

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15Kuhn (1970, p. 166)
16Kuhn (1970, p. 168)
1.2 A short history of referential semantics

Semantics is a part of linguistics that studies the relation between words, expressions or sentences and their meanings. Referential semantics studies the relation between sentences and their truth value. Kuhn’s later versions and interpretations of the incommensurability thesis have a strong emphasis on semantics. If we want to fully understand the increasingly refined versions of Kuhn’s thesis and the criticism thereof by Davidson as well as the criticism by Kripke and Putnam, we need to understand what has been going on in the field of referential semantics. In this section I will provide a short review of the historical development of referential semantics.

According to the correspondence theories of meaning, ‘meaning’ is a relation between the symbols of a language and certain entities which are independent of that language. These entities are independent in the sense that they are not influenced by whoever is using the language, they are not influenced by the circumstances under which the language is used. This approach to meaning is far from self-evident, there are other theories which state that the meaning of a symbol resides in the use of that symbol (for example Wittgenstein’s famous ‘meaning is use’). There are also theories which state that the meaning of a symbol is the set of all stimuli which elicit the use of that symbol as a response. In such theories meaning is therefore defined in terms of the disposition of language users to display certain kinds of behaviour.

Since Greek antiquity, proponents of the various correspondence theories have differed on the nature of the relation between the symbols themselves, the relation between these symbols and entities, and on the nature of the entities that are referred to. This discussion had two main opposing sides, the naturalists and the conventionalists. The naturalists claimed that the meaning of a word is inherent in its sound. This approach is obviously problematic: if this were true we would have no problem learning a foreign language, for we would immediately be able to understand it. Another problem for naturalism is the existence of homonyms, i.e. words that sound the same but have different meanings. This approach also had other problems however, I think they do not warrant discussion here. The idea that meanings are conventions as propagated by the conventionalists ultimately prevailed in this debate. Of course there are limits to this conventionality since we are not free to change the meanings of words at will.

People also differed in opinion on the nature of the entities that are referred to. There were three main variants; conceptualism, Platonism and realism. The conceptualists stated that meaning is a relation between symbols and the content of consciousness. Concepts and propositions are mental entities that are expressed by predicates and by means of sentences. According to Platonism, concepts and propositions are not mental entities, but real things belonging to the world of ideas (not to the world of things) that are reflected in the observable world. Linguistic symbols refer to things in the observable world only indirectly, via the world of ideas. The realists stated that the entities to which linguistic symbols bear the relation of meaning all belong to the concrete and observable reality around us. Meaning is thus a relation of reference.
1.2. A short history of referential semantics

From the latter three views on the nature of entities that are referred to emerged the referential theory of meaning, which states that the meaning of a symbol or expression is that to which it refers. This theory is not about the nature of the entities to which symbols refer and so it fits the three theories mentioned above. The main problem with this theory lies with natural language, because when we accept this approach, a term like ‘unicorn’ would not mean anything (since there is no such a thing as a unicorn). Another problem is that terms or expressions can change meaning with a change of context (such as over time), like the expression ‘the president of the USA’.

1.2.1 Frege’s sense and reference distinction

It was Gottlob Frege who offered important new insights into how to treat meaning and reference. Frege\textsuperscript{17} proposed that if meaning is the same as reference (\textit{Bedeutung}), the expression ‘the Evening Star’ would mean the same as the expression ‘the Morning Star’ since the two have the same reference (both refer to the planet Venus). As the statements ‘the Morning Star is the Morning Star’ and ‘the Morning Star is the Evening Star’ obviously have different cognitive values, Frege concluded that this is unacceptable. An expression ‘\(a = a\)’ is \textit{a priori}, while ‘\(a = b\)’ is informative and can contain a valuable extension of our knowledge (the assertion ‘the Morning Star is the Evening Star’ was a great advance for Babylonian astronomy). Stating ‘\(a = b\)’ means saying that ‘\(a\)’ and ‘\(b\)’ designate the same thing. So the reference in both statements ‘the Morning Star is the Morning Star’ and ‘the Morning Star is the Evening Star’ is the same. The difference in both expressions has to lie somewhere else. Frege therefore concluded that meaning and reference are not the same thing. We can for example know what an expression means, without knowing its reference and vice versa. The difference between the signs corresponds to a difference in the mode of presentation. Frege provides a very good example: consider three lines \(a, b, c\) with a mutual intersection \(d\), now ‘the point of intersection of \(a\) and \(b\)’ refers to \(d\) and ‘the point of intersection of \(b\) and \(c\)’ also refers to \(d\). Both refer to the same point \(d\), but have different modes of presentation. This mode of presentation is contained in what Frege calls the ‘sense’ (\textit{Sinn}).

“The regular connexion between a sign, its sense, and its reference is of such a kind that to the sign there corresponds a definite sense and to that in turn a definite reference, while to a given reference (an object) there does not belong only a single sign.”\textsuperscript{18}

There is a relationship between meaning and reference, expressions with the same meaning must also have the same reference. So the meaning of an expression determines its reference. But expressions with the same reference need not have the same meaning. It is of course possible that there is no reference for a word which does have a sense (expressions like ‘the largest prime number’ or ‘the first man on Mars’ might very well not have a reference, while they certainly have a sense). Words can have a sense, but no reference. The sense and

\textsuperscript{17}Frege (1892)
\textsuperscript{18}Frege (1892, p. 3)
reference of sentences depends on the sense and reference of the words they are composed of. Therefore sentences containing words without a reference can also have a sense without a reference.

Frege makes a distinction between ‘proper names’ (these are names, like ‘Julius Caesar’ and definite descriptions, like ‘the conqueror of Gaul’) and sentences. The reference of a proper name is a single entity or a single object. The sense of a proper name is the way the reference is presented; ‘The president of the USA’ and ‘George W. Bush’ are two presentations of the same reference. Frege also leaves room for something called the ‘idea’, which contains the subjective parts (qualitative experiences, such as emotions and poetic or artistic value) of a name. A word, sign, sign combination or expression expresses a proper name’s sense and designates its reference. As we will see in Chapter 3 about Kripke and Putnam, the idea developed that Frege’s specification of proper names is not specific enough. According to Frege, every expression that refers to a single object can be called a proper name. Kripke and Putnam state that real proper names (like ‘Julius Caesar’) always refer to the same individual (this is called rigid designation), while definite descriptions do not necessarily do so. The expression ‘the conqueror of Gaul’ could well refer to someone else, while ‘Julius Caesar’ can only refer to Julius Caesar.

Sentences (in the form of declarative assertions) also have a sense and a reference. Every sentence expresses a certain proposition, which Frege calls a ‘thought’ (Gedanke). The reference is not always the same as its ‘thought’, however. In a sentence containing the expression ‘the Morning Star’, the expression ‘the Morning Star’ could be replaced by the expression ‘the Evening Star’ without changing the reference of the sentence. For someone who did not know that the two refer to the same thing, the thought of the sentence will now change. If the reference is not the same as its ‘thought’, the ‘thought’ must be regarded as the sense according to Frege. Although a sentence has a thought whether it has a reference or not, Frege claims the thought loses all value as soon as a sentence has no reference or one of its parts has no reference. Because of this loss of value we are not justified in thinking of the thought as being the sense either (the thought incorporates our expectations of the value of a sentence).

For knowledge about the truth of a non a-priori declarative sentence, both the sense and reference of that sentence are relevant. Sense is needed to understand what it is that is true or false. Reference is needed to be able to establish a truth value. Since a declarative sentence is either true or false, the sentence refers to ‘the True’ or to ‘the False’. The reference of a sentence is therefore equal to the truth value. Now if all sentences refer to either ‘the True’ or ‘the False’, all specificity of the reference of a sentence is obliterated. So only the thought in combination with its truth value can yield knowledge. Because the sense determines the reference, the sense of a sentence must contain the conditions under which the sentence is true or false. Without a reference we can have a thought, but only a mythological or literary one, and no truth value can be established. Without a sense there is no thought, and therefore nothing for us to be recognized as true or false.

19See also: Wittgenstein (1913, 4.024)
1.2. A short history of referential semantics

Frege elaborates his theory to include intensional semantics and indirect discourse. Because incommensurability is about scientific expressions, such as names of entities (which can be seen as proper names) and universal laws (which can be seen as declarative sentences), I will restrict my attention to Frege’s basic sense and reference distinction as explained above.

Frege makes a remark which is interesting for the incommensurability discussion; For words or sentences with a different sense, it is not self-evident that they refer to the same object if they actually do. In the next chapter we will see that this idea is what leads Kuhn to incommensurability. Also, the sense of a name cannot be subjective according to Frege as this would mean that the thought of a sentence in which it occurs would be subjective and this would make common science impossible. We can see that the intuition of what Kuhn and Feyerabend later called ‘incommensurability’ was already present in the latter half of the nineteenth century and that it is closely related to the way we approach the concepts of ‘meaning’ and ‘reference’.

In the philosophy of language and semantics it was, and still is, widely accepted that the distinction which Frege makes, between sense and reference, is essential. This leaves philosophers and linguists with the question how proper names and sentences refer. And how they can connect to things that do not exist, such as the term ‘unicorn’ does. Several theories on how reference works exist. Firstly there are the description theories that state that a name is a sort of abbreviation of a definite description. Secondly, there are the Cluster theories, that take a name to refer to a set of definite descriptions. And thirdly, there is the Causal Theory of Reference, of which we will see more in Chapter 3.

1.2.2 The holism – reductionism discussion

Another important distinction in the theories of meaning in the philosophy of language is the classic distinction between reductionism and holism. According to semantic reductionism words are eventually reducible to basic units of meaning. These basic units of meaning correspond to objects, properties, facts and the like, which in turn refer to our immediate experiences. This view proved very problematic since it was totally unclear what these basic units of meaning could be. Therefore semantic reductionism was eventually abandoned.

Semantic holism or meaning holism is the view that words obtain their meaning through their relation with the other words in that language. All words of a language form a network of meaning. The position of a word in this network determines its meaning. Although this view prevailed in the discussion, the notion of holism is still far from clear. It is generally accepted, however, that words relate to other words and at least a large part of their meaning is dependent on this. Advocates of this theory were Davidson, Quine and Putnam.

\[\text{Frege (undated, pp. 2–3)}\]
Chapter 2

Davidson’s argument against incommensurability

Kuhn’s emphasis on the dependence of the meaning of scientific expressions on their theoretical framework implies semantic holism (at least where scientific expressions are concerned). Frege’s theory of sense and reference tells us that a word’s sense determines its reference. In semantic holism a word’s sense (meaning) is determined by that word’s position in a network of meaning. This means that if two different networks corresponding to different theoretical frameworks contain the same word (here ‘word sign’ is meant), the sense of that word will be different. If we assume that sense determines reference, we cannot be certain that there is sameness of reference. We are certainly not justified in assuming that both words refer to the same object, which is what the realist would like to claim. Kuhn even seems to suggest that because of the different theoretical backgrounds we can conclude that these word signs do indeed not have the same reference.

Because of Kuhn’s approach to incommensurability as a linguistic problem, the notion of ‘translation’ enters the discussion.

“In applying the term ‘incommensurability’ to theories, I had intended only to insist that there was no common language within which both could be fully expressed and which could therefore be used in a point-by-point comparison between them.”

Now the problem of comparing theories becomes in part a problem of translation. Translation of one language into another involves compromise (imperfection). This also applies to the translation of one theory into the language of another and this is what Kuhn claims is incommensurability.

“Applied to the conceptual vocabulary deployed in and around a scientific theory, the term ‘incommensurability’ functions metaphor-

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1Kuhn (1976, p. 189)
ically. The phrase ‘no common measure’ becomes ‘no common lan-
guage’. The claim that two theories are incommensurable is then
the claim that there is no language, neutral or otherwise, into which
both theories, conceived as sets of sentences, can be translated with-
out residue or loss.”

According to Howard Sankey, the semantic version of Kuhn’s incommensura-
bility thesis that now arises is characterized by semantic differences between
alternative theories. These differences are meaning variance, translation failure
and, as a result of these, an incomparability of content between theories. Two
alternative scientific theories are then incommensurable if (i) there is variation
of meaning between the vocabulary of the theories and this variation is derived
from differences in the theoretical context, and (ii) translation between these
theories fails, because there is no common language in which to express both.
As a result of (i) and (ii) the content of such theories cannot be compared.
Thus, the content of alternative theories is incomparable because of a transla-
tion failure due to the meaning variance in their vocabulary.

Donald Davidson opposes the idea that impossibility of translating exists. Ba-
sically his idea is that if we can translate a language into our own, there must
be an overlap in the conceptual schemes associated with these languages. There
is no reason to assume there are languages that are untranslatable into our own
(since we would then not be able to tell that they are languages) and so there is
no reason to assume there are conceptual schemes radically different from our
own.

In his ‘On the very idea of a Conceptual Scheme’ Davidson attacks the notion
of incommensurability and other relativism of meaning in general. Davidson’s
philosophical position is closely related to that of W. V. O. Quine, but differs
in important aspects. One of these differences concerns semantic relativism,
which Quine seems to argue for, while Davidson argues against it. Davidson’s
argument against Kuhn’s semantic incommensurability both follows Quine’s
ideas (concerning naturalism) and at the same time diverges from Quine’s se-
mantic relativism (although both call themselves ‘naturalized epistemologist’).
Davidson’s main point in his On the very idea is that the ‘conceptual scheme –
content’ distinction that empiricism makes should be relinquished. Davidson
calls this distinction ‘the third dogma of empiricism’. To be able to understand
Davidson’s argument I will first briefly explain Quine’s criticism of (the first
two dogmas of) empiricism and why Quine allows meaning holism. Then I will
explain Davidson’s argument in further detail. After this, I will explain Kuhn’s
initial reaction to Davidson’s arguments. In Chapter 4, I will go into the later
changes of Kuhn’s thesis that were a (partial) result of Davidson’s argument.

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2Kuhn (1983a, pp. 35–36)
3Sankey (1997, p. 427)
4Davidson (1974)
5Quine (1951)
2.1 Quine’s naturalism, the two dogmas and semantic relativism

Quine’s naturalism consists of the idea that our knowledge of the world is derived solely from our senses (the triggering of our nerve endings to be precise). In his Two Dogmas, Quine claims that our language and the world are connected through our experiences. Our sentences are vocal signals that are associated with certain combinations of neural data. These sentences are what is called ‘observation sentences’. Quine thinks that our (scientific) theories are basically just (re)combinations of observations sentences, which express conditional expectations. Our theories are thus connected to our experiences.

Quine is not a traditional empiricist, however. According to Quine, empiricism contains two dogmas that are not well founded and that should therefore be abandoned.

The first dogma is that of the analytic-synthetic distinction. This distinction tells us that analytic statements are true or false on the basis of their meaning, independent of facts. For example the statement ‘A bachelor is an unmarried man’ is analytic because ‘bachelor’ is defined as ‘unmarried man’. Therefore closer inspection of the meaning of the terms in the sentence leads us to the logical truth ‘an unmarried man is an unmarried man’. Synthetic statements, on the other hand, are true or false on the basis of facts the world provides. To find out if such a statement is true we need to look at the world. For example, to assert the truth or falsity of the statement ‘the Morning Star is the Evening Star’ we need to look at the referents of both terms (in this case the reference of both is Venus, making the statement a synthetic truth). Quine concludes that the truth value of such a sentence can be analysed as involving a linguistic component (the meaning of the words) and a factual component (the situation in the world that makes the sentence true or false). Quine states that it seems reasonable to assume that there are statements that do not have such a factual component (for example statements about ‘unicorns’). These statements should then be called analytic (since they are not about facts, truth value can only be established by looking at their linguistic component). Quine, however, seriously doubts if we can indeed assume the existence of such analytic statements.

According to Quine the analytic-synthetic distinction is highly problematic for empiricism, since there is no clear boundary to be drawn between what is analytic and what is synthetic. Quine objects to the idea of such a boundary, and wonders why empiricism should need to make such a distinction. After all, meaning in empiricism should always lead back (eventually) to our experiences. Quine claims synonymy relations, such as for example ‘bachelor’ being synonymous with ‘unmarried man’ can only be known through our usage of the terms. And since all these relations depend on our usage (and thus on our experience), there is no reason to assume a distinction between the analytic and the synthetic (the meaning of both the analytic and the synthetic is defined through our usage and our experiences). It is up to the empiricists to show where a

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6Quine (1951)  
7Such as ‘when it’s snowing, it’s cold’.  
8This is in accordance with Frege’s sense–reference distinction, which Quine accepts.
boundary can be drawn, but since they do not, the distinction is an unempirical dogma of empiricism. We therefore have no reason whatsoever to assume the analytic-synthetic distinction and should discard it.

The second dogma is reductionism, which tells us that the meaning of isolated statements (statements that are totally separated from other statements) consists in the method of empirically confirming them.

“The dogma of reductionism survives in the supposition that each statement, taken in isolation from its fellows, can admit of confirmation or infirmation at all.”9

According to Quine, in dealing with statements about the world, we have to deal with the totality of our sensory experiences. Our expressions contain words that refer to these experiences and it is a dogma to assume that we can award a truth value to these statements separate from the totality of our experiences.

“We learn some words in isolation, in effect as one-word sentences; we learn further words in context, by learning various short sentences that contain them; and we understand further sentences by constructing from the words thus learned. If the language that we thus learn is afterwards compiled, the manual will necessarily consist for the most part of a word-by-word dictionary, thus obscuring the fact that meanings of words are abstractions from the truth conditions of sentences that contain them.”10

This means that although we learn the meaning of some words without using any other words, once we have a full language in which these words are mixed with other words, it is hard or even impossible to tell what the meaning of statements separated from the language as a whole is. Empiricists have no reason to assume this can be done and therefore reductionism is a dogma of empiricism.

This also means that Quine admits semantic holism. If the meaning of statements is dependent on their relation with the rest of their language, it is entirely possible for a statement to mean two different things in the context of two different languages. Since empiricism cannot assume reductionism, it cannot evade the relativism of meaning. This, of course, does not mean that it is not possible for a statement to mean the same thing in two different languages. We can never be sure that it does, however. This is what leads Quine to his ‘indeterminacy of translation’, which tells us that we can never be sure that one specific translation is the correct one.11

9 Quine (1961, p. 49)
10 Quine (1986, p. 69)
11 This is illustrated by Quine’s famous ‘Gavagai’ example, in which Quine shows us how a native sentence can have countless correct translations.
2.2 Davidson’s attack on conceptual relativism

Quine’s naturalistic philosophy and the discarding of the two dogmas of empiricism forms the background for Davidson’s philosophy. Davidson does not totally accept Quine’s ideas, however. In the following sections, I will explain how Davidson attacks relativism of meaning (such as Quine’s holism) by discarding a third dogma of empiricism.

Davidson accepts Quine’s naturalism and the rejection of the two dogmas of empiricism, and introduces the notion of ‘conceptual scheme’. A conceptual scheme is the total structure of concepts that a language consists of. According to Davidson, language organizes our experiences, and therefore, a conceptual scheme gives form to the data we receive through our senses. Davidson’s notion of conceptual scheme is more or less the same as Kuhn’s notion of paradigm (at least, where language is concerned). Conceptual relativism is the theory that people or groups of people (cultures or communities) can have different conceptual schemes, and that as a result of having a partial or no overlap in these schemes incommensurability occurs.

In his ‘On the very idea of a Conceptual Scheme’, Davidson offers two slightly distinct arguments against incommensurability (and other sorts of relativism of meaning). Firstly, he argues that the very idea of different conceptual schemes is unintelligible. Secondly, he argues that we have no reason to suspect the existence of conceptual schemes that differ. For both of these arguments Davidson assumes that, if there are different conceptual schemes, translation from sentences of one conceptual scheme to sentences of the other is only possible if there is an underlying system on which to plot these different points of view (to provide a basis for translation).

“Different points of view make sense, but only if there is a common co-ordinate system on which to plot them . . .”

Not being able to translate across conceptual schemes thus means there is no counterpart for the hopes, beliefs, desires and knowledge of a person in one scheme in the other scheme. If we thus associate conceptual schemes with language (and see language as something that organizes our experiences, which both Quine and Davidson do), we can assume that where conceptual schemes differ, so will their corresponding languages. But if there is the possibility of translation, there must (at least partly) be a shared conceptual scheme. Conceptual schemes corresponding to mutually translatable languages would then be part of the same ‘underlying’ conceptual scheme. Therefore, impossibility to translate would be a reason to assume the existence of different conceptual schemes.

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12This is what both Kuhn and Quine claim.
13Kuhn’s terminology, Quine uses ‘indeterminacy of translation’, which is a slightly different notion.
14Davidson (1974)
15Davidson (1974, p. 184)
16Davidson claims that even what counts as real in one scheme might not in another.
2.2. Davidson’s attack on conceptual relativism

2.2.1 The scheme – content distinction

As a result of the discarding of the two dogmas of empiricism, Quine accepts semantic holism. Davidson, however, opposes to this idea. According to Davidson, the holism of the new empiricism is a result of a new dogma (that results from the discarding of the earlier dogmas). Davidson explains how this new dogma causes relativism.

Traditional empiricism states that analytic statements are true or false on the basis of their meaning, and synthetic statements on the basis of both their meaning and their empirical content. If we give up the analytic-synthetic distinction the only neutral thing to compare languages by would be the empirical content of sentences, which is something like our experience, facts, the world, etc. Since it is still assumed (by Quine and other relativists) that there are different points of view (different conceptual schemes), this leaves us with the idea of language as embodying a conceptual scheme and the empirical content that is organized by it. The idea is that these different points of view order the empirical content differently. After giving up the analytic-synthetic distinction (such as Quine proposed), empiricists can no longer distinguish between what is theory and what is other language. Theories are thus a part of the ‘whole’ of language. Therefore all ‘meaning’ becomes contaminated with theory and thus Kuhn, Quine and other empiricists conclude that a change of theory entails a change of the conceptual scheme and a change in the meaning of the language associated with that scheme. This leads to semantic relativism. So instead of the old dualism (of the analytic-synthetic) we now have a new dualism of conceptual scheme and empirical content. This is what Davidson calls the third dogma of empiricism.

“I want to urge that this dualism of scheme and content, of organizing system and something waiting to be organized, cannot be made intelligible and defensible. It is itself a dogma of empiricism, a third dogma. The third, and perhaps the last, for if we give it up it is not clear that there is anything distinctive left to call empiricism.”

Davidson concludes that we should give up the scheme-content dualism. The idea of different points of view is unfounded, it is a dogma. Once we discard this third dogma of empiricism, we discard the idea of different points of view and are left with only the empirical content of sentences.

“If we give up the dualism, we abandon the conception of meaning that goes with it, but we do not have to abandon the idea of empirical content: we can hold, if we want, that all sentences have empirical content. Empirical content is in turn explained by reference to the facts, the world, experience, sensation, the totality of sensory stimuli, or something similar.”

Although Davidson does not directly attack the scheme-content dualism, he seriously doubts if a change of theory automatically entails a change in our

17Davidson (1974, p. 189)
18Davidson (1974, p. 189)
2.2. Davidson’s attack on conceptual relativism

conceptual apparatus and the meaning of our language. This leads Davidson to his first argument, concerning the unintelligibility of the idea of different conceptual schemes. How, he argues, would we be able to tell if someone spoke another language, if it sounded just like ours (after a change of theory)? The words after the theory change could just as well mean the same thing as the words before the theory change. To establish that there is a language that sounds like ours, but differs, we need a neutral or common point of view. But it is people like Kuhn and Feyerabend that deny the existence of a neutral or common language. Furthermore, if we take the subject matter of the different languages to provide the common point of view (such as the empirical data provided by our senses), translation would be possible. Davidson thus argues that if some language is untranslatable, we could only establish this from some neutral point of view. If there is no such neutral point of view, we cannot establish the existence of an untranslatable language. If there is a neutral point of view, this would be a basis for translation (through interpretation). According to Davidson, the idea of an untranslatable language and the corresponding idea of different conceptual schemes (such as incommensurability suggests) is therefore an unintelligible concept.

2.2.2 Complete untranslatability

Since different conceptual schemes lead to incommensurability and other relativism, Davidson now argues against the idea of different conceptual schemes. We have seen that the impossibility of translation would be a reason to assume the existence of different conceptual schemes, and therefore, Davidson argues against the possibility of untranslatability in his second argument.

The failure of intertranslatability is a necessary condition for establishing differences in conceptual schemes and the existence of different conceptual schemes. According to Davidson, if there are no untranslatable languages, there is no reason to assume that there are different conceptual schemes and this means that relativism of meaning is unfounded. In his second argument, concerning the existence of different conceptual schemes, Davidson considers two cases, the idea of complete and the idea of partial untranslatability. Complete untranslatability would mean that there is no (significant) range of sentences in one language that can be translated into the other. Partial untranslatability is when some sentences can be translated and some cannot.

Considering complete untranslatability, Davidson wonders how we can confirm that a certain activity is a language if we cannot translate that activity at all. We have seen that Davidson’s discarding of the third dogma leaves us with only the empirical content of sentences to compare languages by. This empirical content of sentences is seen by Davidson as the expression of our experiences (which is the most neutral basis for comparing languages that we have left). Davidson then proposes that something is a language (associated with a conceptual scheme), whether we can translate it or not, if it stands in a certain relation to experience. It is hard to tell what exactly this relation is and Davidson thinks it will certainly not yield a criterion for language that is totally independent of the idea of translation (into a familiar language). However, it is this relation to experience that makes language interpretable.
2.2. Davidson’s attack on conceptual relativism

Following the first argument, Davidson argues that the idea of complete untranslatability is unintelligible, since we have no evidence to suspect that some activity is a language (speech behaviour) if we cannot also interpret it in our language. Davidson argues that if we can recognize some form of activity as a language, we will also be able to interpret it. If this is not possible then the activity cannot be called a language (since we then have no basis for establishing that the activity is a language). If we can interpret the language, then it cannot be completely untranslatable.

Since the idea of a completely untranslatable language is unintelligible, we have no reason to assume there are completely untranslatable languages. We therefore cannot assume the existence of different conceptual schemes on the basis of complete untranslatability.

The idea underlying this approach to translatability, is that words and sentences represent a speaker’s attitudes and that language is therefore closely related to experience. We are able to describe the attitudes of a native speaker and we are thus (through interpretation) able to translate his language into our own. Therefore, Davidson thinks that languages that organize experiences (that are equal or similar to ours) will be languages like our own and because of expressing the same attitudes they will be translatable into ours. We have to bear in mind here that Davidson assumes that people have similar experiences and also that we are talking about translatability in principle (translation might be very difficult in practice sometimes). Davidson argues that, given enough time, we can gather all information necessary to correctly interpret a native speaker. We start out by radically interpreting (a process of which I will tell more in the next section) and then step by step refine our theory about the native language.

Davidson’s approach to the idea of complete untranslatability constitutes the basis for his approach to the idea of partial untranslatability.

2.2.3 Partial untranslatability

If there is a basis for interpretation, Davidson argues, there cannot be such a thing as complete untranslatability. In the previous section, we have seen that Davidson argues that even the entire concept of complete untranslatability is unintelligible. Davidson then looks if partial untranslatability is an option and a reason to assume the existence of different conceptual schemes.

Someone’s speech cannot be interpreted unless we know a good deal about that person’s beliefs, and we cannot understand the subtleties of beliefs without understanding the language. According to Davidson, we may accept very general attitudes towards sentences as the basic evidence for a theory of radical interpretation.

By testing the conditions under which a speaker of another (unknown) language holds his statements to be true or false, we can get an idea of the truth conditions of that expression, this process is called radical interpretation (this is illustrated by Quine’s famous ‘Gavagai’ example). Merely knowing that a speaker holds a sentence to be true gives us no information about what the sentence means and what belief holding that sentence to be true represents. Interpretation gives us
2.2. Davidson’s attack on conceptual relativism

a way of abstracting a workable theory of meaning and an acceptable theory of belief. Even in our own language we re-interpret words in order to preserve a reasonable theory of belief. To be able to interpret we must be able to assume general agreement on beliefs. This makes meaningful disagreement possible. We cannot begin interpretation without assuming that our beliefs and the speaker’s beliefs correspond. We need to assume a ‘principle of charity’, just as we have seen in the last section we need to assume that most of this speaker’s beliefs are true when we want to understand him and we have to assume that these beliefs are similar to ours. Charity thus is a condition (not an option) for having a workable theory.

“Charity is forced on us; whether we like it or not, if we want to understand others, we must count them right in most matters. If we can produce a theory that reconciles charity and the formal conditions for a theory, we have done all that could be done to ensure communication. Nothing more is possible, and nothing more is needed.”

The principle of charity is to be seen as the basis on which communication and interpretation can take place. If we assume that speakers of a native language express (and mean to express) true sentences, we can start interpreting what the sentences mean. Of course, once we learn more about the native language we can find out that some of the statements expressed are actually false.

Davidson then argues that the idea of partial translation failure is not more clear than that of complete untranslatability. Given the idea of radical interpretation and accepting the principle of charity there is no basis for judging that others have concepts and beliefs radically different from our own. Since complete untranslatability is not an option, there will be a part of the native language that we can understand. If we can understand part of the language through radical interpretation, we can also interpret the rest of it (again Davidson is not concerned with practical translation, he is concerned with translation in principle).

To be able to identify different conceptual schemes we need to assume translatability (otherwise we cannot judge the content of the scheme). But just as with the beliefs of a native speaker, we simply cannot be in a position to judge if a conceptual scheme differs radically from our own since translatability implies that the scheme cannot be different from ours. Davidson’s argument is therefore that there is just no reason to assume there are conceptual schemes different from our own. Davidson thus argues that giving up the third dogma (which causes the idea of different points of view to vanish) makes conceptual relativism disappear.

2.2.4 Summary

We have seen that Davidson argues that, if different conceptual schemes exist, these schemes have different languages associated with them that are mutually

19Davidson (1974, p. 197)
untranslatable. Two different languages need not necessarily belong to different conceptual schemes however. If two languages are intertranslatable, they belong to the same conceptual scheme. Firstly, Davidson argues that the very idea of different conceptual schemes is incoherent and unintelligible, and that the third dogma of empiricism (the scheme-content distinction) which gives rise to the idea of different conceptual schemes should be given up. Secondly, Davidson argues that there is no evidence that points to the existence of (completely or partially) untranslatable languages and we may thus conclude that there is no evidence to assume the existence of conceptual schemes that are different from our own.

According to Davidson the idea of the existence of complete untranslatability requires some sort of ‘underlying space’, which makes it possible for us to distinguish between different conceptual schemes (and which thus enables us to establish that there are untranslatable languages). If there were no such underlying space we would not be able to do this. Since Quine already discarded the two empirical dogmas, we can assume there is no ‘set’ of fixed meanings which this underlying space could consist of. And we cannot assume a theory-independent reality. There is therefore no reason at all to assume that an underlying space exists. Therefore, there is no criterion left to be able to establish that some activity is a language if it is not interpretable. The idea of complete untranslatability is therefore not an understandable notion, and should be abandoned.

Partial untranslatability might very well be a possibility, but after discarding the third dogma there is no reason to suspect that this leads to conceptual relativism or incommensurability. Knowing that a speaker holds a certain statement to be true gives us no further information about the content of this speaker’s belief. Without knowledge about this speaker’s beliefs we cannot start interpreting his language. Therefore, we have to assume the ‘principle of charity’. When we then assume that the speaker’s and our beliefs (largely) correspond, there is no more reason to assume that radically different beliefs exist. If this is so, there is also no reason to assume the existence of different conceptual schemes on the basis of partial untranslatability.

Both complete and partial untranslatability, according to Davidson, can no longer play a role in a theory about conceptual relativism or incommensurability. Davidson thus argues that incommensurability is impossible, because intelligibility (being able to judge if a conceptual scheme is different) entails translatability and thus commensurability. And so, Kuhn’s ideas are unintelligible.

### 2.3 Criticism of Davidson

There are certain issues in which Davidson in not very precise and clear (read: obscure). His attack on conceptual relativism raised several arguments. According to Howard Sankey,\(^{20}\) we can recognize a language not only from its translatability into ours, but also from contextual and formal features, like sounds or inscriptions. We do recognize ancient markings on a stone as a language.

\(^{20}\) Sankey (1990)
without necessarily being able to translate it. It is unclear why knowledge of semantic content (such as the writer’s or speaker’s beliefs) should be necessary for language attribution as Davidson would like to claim. Sankey argues that formal and contextual features also count for something. The second World War and the Cold War have shown us that codes may be recognized as codes without being broken. Archaeology has shown us that fragments of dead languages may be recognized as such prior to translation. The fact that we start interpreting and translating also implies that we know that a speaker has a language, before we actually begin the process of translation.

Another point of criticism is that Davidson stresses the necessity of a ‘principle of charity’. According to Stich and Goldman this principle might very well be a necessity, but it does not tell us if assuming it is correct. Also it is unclear how much charity must be assumed exactly (is a native speaker always right?). A strong interpretation of the principle means speakers of different languages have hardly or no different beliefs. Assuming rationality of native speakers cannot be just assumed, but should be the subject of empirical research.

According to Igor Douven and Henk de Regt, even if we could not find and identify an untranslatable language, we could only conclude that there is no such a thing as an untranslatable language if we can assume a ‘verificationist principle’. This principle should tell us that from being unable to establish something we can infer that this something is indeed not the case. Assuming such a principle does not seem very plausible. Davidson can only conclude that there is no evidence for the existence of different conceptual schemes, not that different conceptual schemes do not exist.

### 2.4 Kuhn’s response to Davidson

According to Kuhn, the fact that historians and anthropologists seem to be able to produce successful interpretations seems to be a fundamental assumption of Davidson’s argument against incommensurability. Kuhn claims that Davidson’s argument depends critically upon an equation of interpretation with translation, which finds its source in Quine’s ‘Word and Object’. Although Kuhn’s response is presented as a reaction to Davidson’s (second) argument, Kuhn actually only responds to Davidson’s reference to Quine’s theory of radical interpretation and completely bypasses Davidson’s real argument (Kuhn does refer to Davidson’s article and as we will see in Chapter 4, alters his incommensurability thesis because of it).

In section 2.2, we have seen that Davidson assumes that if something can be interpreted, it can also be translated. Kuhn argues that interpretation is not the same as translation. Actual translation might very well involve interpretation, but Kuhn stresses that these must be seen as two distinct processes. Translation is something done by a person who knows two languages, in which words or strings of words from one language are substituted for words or strings of words from the other (with sameness of meaning and reference). An in-
The interpreter has to assume that good sense can be made of apparently linguistic behaviour and starts making hypotheses. Successful interpretation means becoming bilingual. Learning a language is therefore not the same as translating, although this is often assumed in philosophical discussion. Being able to learn a new language does not imply that one is able to translate it into one’s own. A perfect translation would preserve meanings, intensionalities and concepts (not just reference). There are therefore no perfect translations and a radical translator must therefore interpret. Suppose there is no English coreferential with the term ‘Gavagai’, then speakers who learn to use the term would speak the native language and not English when uttering the term. This being unable to translate, according to Kuhn, is ‘incommensurability’.²⁵

According to Kuhn, it is very possible to be unable to translate a foreign language into a language you already speak. But this does not mean that you cannot learn the language (by interpretation). Quine proposes that we do exactly this when confronted with a native language. It now seems that Kuhn’s ‘incommensurability’ is the same as Quine’s ‘indeterminacy of translation’. But, Kuhn argues, Quine is mistaken in the idea that we have to conclude that there is always an indeterminacy of translation.

“...most or all of Quine’s arguments for the indeterminacy of translation can, with equal force, be directed to an opposite conclusion: instead of there being an infinite number of translations compatible with all normal dispositions to speech behaviour, there are often none at all.”²⁶

Quine concludes from his ‘indeterminacy thesis’ that the concept of meaning must be abandoned (according to Quine we can never establish the exact meaning),²⁷ and claims that reference in both natural and scientific language is in-scrutable. Kuhn, however, thinks that what a term means and refers to in another language is just very difficult to discover, but not necessarily impossible. Even though Kuhn thinks it is possible to discover, he also admits that one can never be absolutely certain one has succeeded. This makes the ‘incommensurability’ and ‘indeterminacy’ theses slightly different, although they are quite similar in many respects.

To see how the theses differ, let’s look at the following example. Kuhn thinks that comparing theories only involves identifying reference. This identification is made more difficult by the intrinsic imperfection of translation, but it is not

²⁴Kuhn (1989, p. 61)
²⁵Kuhn (1983a, pp. 39–40)
²⁶Kuhn (1989, p. 61)
²⁷Quine (1961)
in principle impossible.\textsuperscript{28} Let’s compare the theory of ‘phlogiston’ with modern science. Can we now correctly assert that the term ‘phlogiston’ is untranslatable? We can, after all, in a number of ways describe in modern language how the term refers and thus a translation into modern language seems possible. This is wrong according to Kuhn: the referent of ‘phlogiston’ is described in a number of phrases which contain other untranslatable terms, like ‘principle’ and ‘element’. Together these terms constitute an interdefined set that must be learned as a whole. It is only when we learn the entire language associated with this theory that we can correctly understand what the term ‘phlogiston’ refers to. It is, however, not possible to translate the term into modern terminology. This makes the term ‘phlogiston’ incommensurable with modern science. We can see that an older theory does not talk about the same individual substances and processes, but structures the world differently. Its reference is not necessarily indeterminate however, since the conditions are given by its meaning (meaning determines reference) and the meaning becomes known when we acquire the associated language.

According to Kuhn, when comparing theories or languages people use different criteria in identifying referents. These criteria are not merely conventional, however. The language people speak is adapted to the world in which they live, and apparently the world does not present objects or situations which would lead people to different identifications. Speakers of the same language are from the same culture, in which one can expect the same objects or situations. A speaker has to learn by experience when terms apply and don’t apply to situations (when learning about the use of the term ‘cats’ we also have to learn not to apply the term to dogs). This underlines Kuhn’s holistic approach to language. Kuhn claims that different languages impose different structures on the world. The criteria for reference will connect a term in a lexical network with certain terms and distance them from others. According to Kuhn, this lexicon will then mirror aspects of the world and also limits the phenomena that can be described with this lexicon. An anomaly in science will therefore require adapting the relation between terms in the lexicon, thus altering the language. Members of a language community have a homology of lexical structure according to Kuhn. To be able to communicate, their taxonomic structures must match.

“But their taxonomic structures must match, for where language is different, the world is different, language is private, and communication ceases until one party acquires the language of the other.”\textsuperscript{29}

In the case of translation, terms need not be shared, but the referring expressions in one language must have co-referential expressions in the other and the lexical structures of both languages must be the same. The taxonomy must be preserved. This is why phlogiston does not match with modern chemistry. If translation is not possible, the very different methods of interpretation and language acquisition are required.

\textsuperscript{28}Kuhn (1976), Kuhn thinks that translation cannot be entirely construed in referential terms. Something from the realm of meanings, intensionalities, concepts must be invoked as well.

\textsuperscript{29}Kuhn (1983a, p. 52)
Commensurability and incommensurability, as presented in Kuhn’s later work, are terms that denote a relation obtaining between linguistic (lexical) structures. There are two points underlying this linguistic reformulation of the notion of incommensurability. Firstly, *strict* translation between two incommensurable languages is not possible, although various paraphrases *may* suffice for adequate communication. Secondly, Kuhn claims that technical scientific terminology always occurs in families of essentially interrelated terms. These terms can be kind terms, which Kuhn calls taxonomic categories. These taxonomic categories have no overlap—two different categories do not have an instance in common (unless one category completely includes the other). The interrelated terms can also be terms whose meanings are determined in part by scientific laws relating them. Therefore a change in the understanding or formulation of the relevant law must result in fundamental differences in the understandings of the corresponding terms. Thus these interrelated terms would be incommensurable.

In the next chapters, I will describe the issue of reference of kind terms. In Chapter 4, I will discuss the influence of the arguments of Davidson, and show the adjustments Kuhn made to his incommensurability thesis as a result of these arguments.
Chapter 3


In the previous chapters we have seen that Kuhn’s semantic version of the incommensurability thesis is founded on Frege’s classical distinction between sense and reference, and on the idea of semantic holism. Saul Kripke and Hilary Putnam oppose to both of these foundations in their philosophy of referential semantics. Although Kripke does not explicitly attack Kuhn’s incommensurability thesis or semantic relativism in general in his ‘Naming and Necessity’, he suggests an approach to referential semantics that can quite easily be seen as an attack on any sort of semantic relativism. The ‘causal theory of reference’ for proper names and kind terms, proposed by Kripke and Putnam is considered to be one of the arguments against incommensurability as it shows how to avoid relativism of meaning.

3.1 From the description theory of names to the causal theory

As I mentioned earlier (in Chapter 1) Kripke makes a distinction between names (by which Kripke means proper names, such as the name of a person or of a city) and definite descriptions. This distinction differs from Frege’s distinction that was explained in Chapter 1. Kripke explicitly states that names do not include definite descriptions, and that they are only used as things we call ‘proper names’ in ordinary language. This distinction is made in (ordinary) language, but not in Frege’s classical semantics and logic. Frege (and Traditional Empiricists) considered proper names to be disguised or abbreviated definite descriptions. These definite descriptions contain ‘uniquely identifying proper-

1Kripke (1980)
2Kripke (1980, p. 24)
ties’, which we use to identify an object (which is then that name’s referent). It is this so-called ‘description theory of names’ that Kripke and Putnam attack. In doing so, Kripke and Putnam oppose both Frege’s idea of ‘sense’ and the idea of semantic holism.

In the different versions of the ‘description theory of names’ that were proposed either a speaker denotes something when using a name, in which case a name denotes something upon a particular occasion of its use by that speaker (depending on the particular description that speaker associates with the name) or the (proper) name itself denotes something, in which case the meaning of a name is independent of the speaker because the name stands for a fixed description or set of descriptions which can be used to identify the bearer of that name. In the latter theory, a speaker using a particular name does not necessarily have to know the description(s) that name stands for.

3.1.1 Kripke’s attack on the description theory of names

If names are abbreviated definite descriptions, then picking out a referent for a given name should be no problem if a speaker knows what that name means. If a name has no descriptive content, however, then picking out its referent has to be done by pointing (ostension). Kripke states that we simply cannot point to the object (person) that the name ‘Aristotle’ refers to, so in this case our reference seems to be determined by our knowledge of Aristotle. According to description theorists, to be able to pick out the referent of ‘Aristotle’, this knowledge needs to contain one or more descriptive sentences (from now on I will call these ‘definite descriptions’). This, however, would mean that the meaning (sense) of a proper name varies from speaker to speaker if they associate different definite descriptions with that name.

We could suppose that the description belonging to the name ‘Aristotle’ (for some speaker) is something like ‘the man who taught Alexander the Great’. Description theorists think it is descriptions like this that most people associate with names such as ‘Aristotle’, ‘Nixon’ or ‘Walter Scott’. However, Kripke argues that ‘Aristotle was the teacher of Alexander the Great’ is an informative sentence and not a tautology. This suggests that a real definite description belonging to a proper name should lead to a tautology when stating ‘x is y’. We can also imagine that in fact Aristotle did not teach Alexander the Great. Expressing this would not lead to a contradiction. Because such a description is informative and does not lead to tautologies or contradictions when expressed as being equal (or not equal) to its proper name, a definite description cannot be part of the meaning (Frege’s sense) of the name ‘Aristotle’.

To defend the description theory against this line of argumentation, description theorists suggested that a name does not have a single definite description, but a family of (associated) definite descriptions (this is called the ‘cluster concept theory’ or ‘cluster of descriptions theory’). This idea leads to the same problems,

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3 For more about this distinction see: Evans (1973, pp. 187–208)
4 The referent of a definite description (in Kripke’s philosophy) is the object that uniquely satisfies the conditions in that definite description (in a logical sense).
5 A definite description of which the proper name is an abbreviation, such as would be proposed by description theorists.
3.1. *From the description theory of names to the causal theory*

However, as an example Kripke uses the word ‘Tiger’. One of the descriptions belonging to the word ‘Tiger’ is ‘having four legs’. Now Kripke claims there is no contradiction in saying ‘three-legged tiger’. This also counts for all other properties in the cluster-description of ‘Tiger’. It is also conceivable that an object satisfies all (or most) descriptions, and nevertheless is not a tiger.

Kripke concludes none of the sort of expressions mentioned above leads to a tautology or a contradiction, and therefore definite descriptions cannot be part of the *sense* of a proper name. Although descriptions cannot be part of a name’s *sense*, it is perhaps possible that they can help determine the name’s referent (see the ‘Aristotle’ example). Because we cannot point to ‘Aristotle’, we have to determine what the name refers to through descriptions. According to Kripke, when we take a description (or set of descriptions) of ‘Aristotle’, it is not unimaginable for this description to pick out someone else that fits the description even better. If we take a description of ‘Aristotle’ that, for example, fits ‘Aristotle’s nephew’ better, the name ‘Aristotle’ refers to Aristotle’s nephew. This is of course unacceptable, since the result is that the meaning of ‘Aristotle’ could be ‘Aristotle’s nephew’, so Kripke argues that we cannot equate descriptions to meaning at all.

A speaker can use the name Gödel, while only associating the description ‘prover of the incompleteness of Arithmetic’ with that name (this is probably all most people know of Gödel). It is possible, however, that in fact a man called ‘Schmidt’ came up with this proof, which Gödel then stole and presented as his own. Someone who now says ‘Gödel is the prover of the incompleteness of Arithmetic’ is stating something untrue. Kripke therefore concludes that the description theory provides unacceptable truth conditions. It would mean for example, that if Mr. X is wrongly introduced to us as Mr. Y, and Mr. X is with us, we would have a true conviction when believing Mr. Y is with us, since the majority of our descriptions associated with ‘Mr. Y’ are satisfied.

Kripke concludes that the relation between names and descriptions is such that a description can be a connotation for a name, but it cannot be part of that name’s sense (since there is no contradiction in saying that ‘Aristotle was the man who taught Alexander the Great’). So, descriptions can only help us determine a proper name’s referent.

3.1.2 *Proper names as rigid designators*

Kripke then proposes and argues that names are *rigid designators*. Something is a rigid designator if it designates the same object in every possible world. An object does not actually need to exist in every world. For example, the name ‘Nixon’ always refers to the same person, although Nixon might not have been the president of the USA in 1970 in every world. So the name ‘Nixon’ is rigid,

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6 Evans (1973, pp. 187–208)

7 In ordinary language there are some descriptions that should be treated as names, for example ‘The Holy Roman Empire’ is neither Holy, Roman nor an empire, and should thus be considered a name.

8 Kripke is much involved with set-theoretic-model-theory of quantified logic and possible-world semantics, this explains the mentioning of possible worlds, which is a subject I’m not going to pay explicit attention to in this thesis.
3.1. From the description theory of names to the causal theory

while the description ‘president of the USA in 1970’ is not. The word ‘rigid’ in
‘rigid designator’ means that a designator refers to the same thing in all possible
worlds in our language when we talk about counterfactual situations (not in
some possible worlder’s language). We use our meanings and our references.

Because there is no contradiction in stating that ‘Nixon was not the president
of the USA in 1970’ Kripke is able to defend that there is a difference between
‘Nixon’ and ‘the president of the USA in 1970’. The first is used to fix a
reference by stipulating it to be a rigid designator of the object (person) that is
Nixon. The second is a description which does not designate anything rigidly,
because someone else might have been the president of the USA in 1970. If the
description were used to fix the referent, an expression like ‘Nixon might not
have been the president of the USA in 1970’ would seem like a contradiction
(but is in fact false). Of course, we mean to say that it is that particular man
that might not have been the president of the USA in 1970. We cannot say
Nixon might not have been Nixon. The reason for this is that ‘Nixon’ rigidly
designates a certain person. Thus, Kripke concludes, names are always rigid
designators.

Kripke now looks at the relation between names and the existence of their
referents (this is highly interesting for the incommensurability discussion). We
could say that ‘Moses’ means ‘the man who did such and such’, now if we find
out that no one did such and such, then according to description theorists we
must conclude that Moses did not exist. But if we consider the description
belonging to ‘Moses’ to just fix the reference, then it is clear that something
different is meant. Instead of the description being the meaning of ‘Moses’, we
can now view it as a description of the object ‘Moses’, which in this particular
case is just false. In Kripke’s view this is just a statement about an object
that is rigidly designated by the name ‘Moses’. The existence and uniqueness
conditions in the two different approaches are different. In the first we conclude
that nothing satisfies the meaning of ‘Moses’ (there is no object that fits the
description) and therefore we conclude that Moses does not exist. In the second
the object ‘Moses’ is described falsely (while that does not change anything in
the existence claim concerning ‘Moses’). The second approach shows us that an
object can very well exist independently of its associated description(s), whether
an associated description is true or false. This is of course an answer to Kuhn’s
incommensurability thesis. Since Kripke’s approach implies the independence
of objects from their associated descriptions, theories or paradigms, Kripke is
able to defend that there is no need to assume semantic holism concerning
names. With this approach Kripke also opposes Frege’s idea that the sense of
a designator (if this designator is a proper name) is its meaning and that the
sense determines the reference.

Now, if we accept the second approach and say ‘Moses does not exist’, this may
mean various things. It may mean ‘the Israelites did not have a single leader
when they withdrew from Egypt’ or ‘their leader was not called Moses’ or ‘there
cannot have been anyone who accomplished all that the Bible relates of Moses’.
The description does not give us any necessary properties of Moses. Moses,
according to Kripke, might have lived without doing any of these things at all.
So Kripke concludes that the only acceptable option is that the name ‘Moses’
3.1. **From the description theory of names to the causal theory**

refers to the man that was called ‘Moses’ (not to the man that we call ‘Moses’, as this would obviously lead to an unacceptable circularity).

3.1.3 **The causal theory of reference**

Kripke claims that it is not the case that the reference of a proper name is determined by uniquely identifying properties since the properties believed by a speaker to belong to a name need not be uniquely true of the actual referent and these properties do not need to uniquely specify the actual referent. The reference of a proper name, Kripke claims, is determined by the fact that a speaker is a member of a community of speakers who passed on the reference through tradition from speaker to speaker. As a metaphor, this community can be seen as a chain, in which the individual speakers form links. It is possible that a description or uniquely identifying property is used to determine the referent of a name, but that will only occur in the initial act of baptizing (when the first speaker in a chain gives an object its name). This description or property is then used to fix the reference. It does not act as an abbreviation of that name. Every speaker in such a community will refer to the initial act of baptizing when using a certain name. So the reference of a name is determined by a causal chain of communication (except for those who give an objects its name) and a definite description or ostension can be used to fix the reference of a name.

Kripke and Putnam now propose their Causal Theory of Reference. This theory states that a speaker using a name ‘\(N\)’ on a particular occasion will denote an item \(x\) if there is a causal chain of reference-preserving links that lead back from the speaker’s use of the name to the occasion on which the object \(x\) originally acquired the name ‘\(N\)’. The acquiring of a name is something like an act of baptizing, explicit dubbing or a more gradual process. The idea of ‘reference preserving links’ is that a speaker has the same intentions with the word as the person from whom he learned it and that this way the reference will remain the same with the use of that word by these speakers. As long as there is a causal connection between a name’s act of baptizing and a later use, that later use will refer to the same object as that of the original act of baptizing.

We see that Kripke and Putnam’s Causal Theory of Reference states that proper names have no definitions. They are not associated with definite descriptions at all. According to Kripke and Putnam a name is a label that attaches to one individual or one thing as a product of history that starts with an act of baptizing. We determine a name’s referent by letting someone (who possesses knowledge about this name) point out that referent or we use a contingent fact and then trace back the life history to see whether it includes the appropriate act of baptizing.

According to Kripke and Putnam and other causal theorists this also applies to the naming of natural kinds. This assumes that ‘natural kinds’ exist and that they can somehow be named. Kripke and Putnam propose that once someone names a natural kind, that particular name will refer to the natural kind. This does not mean the speaker who baptized the natural kind needs to know any (uniquely identifying) property of that natural kind. We can fix the name in the way described above by using definite descriptions or through ostension.
3.1. From the description theory of names to the causal theory

For example, Putnam claims that the referent of ‘electric charge’ (which is considered to be a name and not a description) is fixed by pointing to the needle of a galvanometer and saying that ‘electric charge’ is the name of the physical magnitude responsible for its deflection. So by using the expression ‘electrical charge’, we refer to the cause of an (observable) phenomenon, whatever that cause exactly is. Another example is that the name ‘Gold’ has always referred to Gold, although centuries after its baptism did scientists find out about the essential property of Gold. This does of course mean that people can, and could have been, mistaken in their use of the term, but it also shows how semantic holism concerning names for unobservable entities can be avoided.

The Causal Theory shows us how to fix the reference of names without using Frege’s idea of sense. Names are fixed (by an act of baptizing) to perceptually present objects and then disseminated throughout a community. This results in each member of that community using that name to refer to the same object or kind of objects. Although ideas about a kind can vary, the referent of the kind term will remain unchanged. This way we can point at the Earth and name it ‘Earth’ or we can use a contingently applicable description (or set of descriptions). This way the idea that the Earth has a fixed position is not part of the meaning or definition of the term ‘Earth’, but either only part of a theory about the motion of the Earth or an analytic truth about the Earth. We can see the advantage of such a theory. While Kuhn obscures the notion of ‘Earth’, Kripke shows us how to keep the notion of ‘Earth’ separated from descriptions or theories about it.

If we accept this theory, it means that scientists from different Paradigms do talk about the same objects and only have different theories about those objects (which can be true or false). These theories simply describe the objects, and the names for the objects refer to the objects or phenomena that were initially baptized. So, for example, the term ‘electron’ as used by Bohr refers to the same object as the term ‘electron’ that is used by current science. If two theories are indeed opposed, at least one must be false. This way of thinking is illustrated by Putnam’s direct reply to Kuhn’s relativism:

“... we can answer Kuhn by saying there are entities – in fact, just the entities we now call ‘electrons’ – which behave like Bohr’s ‘electrons’ in many ways. And the principle of the benefit of the doubt dictates that we should, in these circumstances, take Bohr to have been referring to what we call ‘electrons’. We should just say we have a different theory of the same entities Bohr called ‘electrons’ back then; his term did refer.”

Putnam’s approach relies on his ‘principle of the benefit of doubt’. This principle tells us that whenever reasonably possible, we need to interpret scientists from the past as referring to the same entities that current scientists do. This theory enables Putnam to let the Causal Theory be generally applicable to theoretical terms. Because this principle is problematic, I will elaborate on it further in the next section.

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9 According to relatively recent science, the essential property of ‘Gold’ is that it has the atomic number 79.
10 Putnam (1978, p. 241)
11 Douven (2000, pp. 135–146)
3.2 Criticism of the causal theory of reference

With their causal theory of reference Kripke and Putnam attack the problem of semantic holism. Their overall approach, the idea of fixed meanings, seems to represent the common sense (realist) position. However, it is not clear whether their specific arguments supporting this approach or the causal theory’s consequences, are common sense as well. There are several arguments against the causal theory of reference which cast some doubt on its common sense appearance. I will now discuss those arguments that are relevant to the incommensurability discussion.

3.2.1 The problem of intentionality

One of the problems with the causal theory is its strictness concerning names and their reference. According to Gareth Evans, the causal theory ignores the way in which conversational and intentional context can be determinative of what gets said. Therefore the theory has unacceptable consequences.

“The Causal Theory again ignores the importance of surrounding context, and regards the capacity to denote something as a magic trick which has somehow been passed on, and once passed on cannot be lost.”

A consequence is that, when a particular name is used again (for example because someone is named after his grandfather) it will be causally connected and will still refer to its older bearer. But when we use this person’s name we can, of course, intend to refer to this new person, and not to this person’s grandfather. We cannot simply ignore this intentionality in a speaker uttering a name. According to Evans, we thus have to conclude that the reference of a name is (at least partially) dependent on the intentions of its speaker. This is in conflict with Kripke’s ideas (as we can see in the ‘Moses’ example mentioned above). Kripke argues that the name ‘Moses’ rigidly refers to the person that was called Moses, and not to some person of which we intend to say that he did ‘such and such’. So if we intend to say ‘person who did such and such’, when uttering the name ‘Moses’, our utterance could very well be false.

Because speakers can intend to refer to something, we not only have to consider the denotation (reference) of names, but also the possibility of denotation by speakers. Evans thinks that the object a speaker intends to refer to by using a name is that which satisfies the descriptions that speaker associates with that name. These descriptions might very well not be satisfied by the grandfather. Evans therefore concludes that we have to conclude that the causal theory is too strict, it cannot deliver a totally non-intentional theory of reference. Evans states that not only a name can denote, but also that a speaker can denote. If a speaker denotes, we have to allow a descriptive element.

This is not a direct argument against Kripke, however, since Kripke talks about the reference of proper names and not of that of speakers. Evans seems to agree with Kripke and Putnam’s ideas concerning the reference of names. Kripke and Putnam also included intentionality in their Causal Theory. This intentionality

\[12\] Evans (1973)

\[13\] Evans (1973, p. 192)
is part of the ‘causal chain of reference-preserving links’. After all, speakers in the Causal Theory will only refer to the same object if the reference is preserved in a causal chain within a speakers’ community. Of course, this preservation of reference has something to do with the speaker’s intentionality. It is possible for causal theorists to state that this sort of intentionality breaks the causal chain because it ignores the reference-preserving element and that therefore the name in question cannot be considered to refer to the same object. Although this cannot directly harm Kripke’s theory, it stresses that the causal theory is far from clear on how exactly this reference is preserved. Since Kripke and Putnam would probably not like to claim that reference is preserved if a speaker intends reference to be preserved, they need to elaborate on how exactly reference-preservation works.

### 3.2.2 The problem with natural kinds

There are also some problems with the Causal Theory concerning natural kind terms. These are very relevant to the incommensurability discussion since they include the names of entities from scientific theories.

The first problem is that, when we are shown several (observable) instances or samples from a kind term, it need not be exactly clear what kind these instances are an example of. They might well be an instance of more kinds, such as the object ‘Tiger’ is an instance of ‘tiger’, ‘animal’ and ‘mammal’. It is hard to specify how instances of a supposed natural kind can be named without supplying something of a description. This means that a combination of causal and descriptive theory is needed to learn about natural kinds.

A second problem is that the causal theory cannot be applied to names of kinds that are unobservable (such as ‘electron’ or ‘atom’). Fred Kroon and Robert Nola claim that the causal theory is especially problematic concerning theoretical terms since these are especially liable to incommensurability with the change of theories. Kripke and Putnam’s causal theory of reference of natural kind terms allows a great deal of theory change without any referential variance. The causal theory does not explain how non-observational terms get their reference fixed, however. We cannot simply point to an electron and name it. As with the ‘Tiger’ example, naming a theoretical object involves at least an element of description to help determine what exactly we are naming (according to Kroon & Nola). After all, the only thing we can observe is certain phenomena. It is highly likely that different scientific theories also provide different descriptions. We can solve this problem by saying that unobservable kinds often stand in correlatory, causal, part/whole or other relations to observable objects and kinds.\(^\text{14}\)

But this defence raises another problem. The problem is that, just stating that there needs to be a ‘relation’ between the kind term and observable relations, this relation is so broad it can hardly fail to fix a reference.\(^\text{15}\) Stating that \(X\) refers to whatever is causing our observables \(O\) is just not precise enough. The

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\(^{14}\)Kroon & Nola (2001), Kroon en Nola illustrate this with Semmelweis’ ‘childbed fever’ example.

\(^{15}\)Unless the world is not as deterministic as we think, there is always some underlying phenomenon causing our observable phenomena.
term ‘phlogiston’ might very well then refer to oxygen (or any other substance that causes combustion according to any theory would suffice). This is not what the phlogiston theory was about. And therefore this approach is unacceptable. Adding more descriptive elements from the phlogiston theory makes it clear that we are not talking about ‘oxygen’. By adding more descriptive elements we get what is called ‘causal descriptivism’.

Reference fixing for theoretical terms involves descriptive elements and cannot be done with a ‘pure’ causal theory. It does, however, not necessarily need to involve all descriptions of a theory (which is what led us to incommensurability).

3.2.3 The problem with the principle of benefit of the doubt

Kripke and Putnam do not allow for a descriptive element in their theory of naming. However, Kripke’s theory of naming only tells us how naming for observable objects and properties could take place, and is therefore not about theoretical terms. To be able to let theoretical terms used by scientists from the past refer to entities posited by contemporary scientists, within a Causal Theory of Reference and without allowing any descriptive element, Putnam proposes a ‘Principle of Benefit of the Doubt’. According to Igor Douven this theory is unjustifiable.

Putnam states the following about the principle of benefit of the doubt:

“... when speakers specify a referent for a term they use by a description and, because of mistaken factual beliefs that these speakers have, that description fails to refer, we should assume that they would accept reasonable reformulations of their description.”

The idea of reasonable reformulations is of course meant to be able to include Mendel’s ‘gene’ (which can be said to be quite similar to the current meaning of ‘gene’), while excluding Priestley’s ‘phlogiston’ (which is not similar to any entity posited by current science). If a scientist from an older theory indeed accepts such a reformulation, it seems acceptable to claim that the referent of the scientific term involved in both past and present science refers to the same entity.

But, according to Douven, even if a scientist from the past accepted such a reformulation, that is no reason to assume that there is referential continuity between his theory and the contemporary theory. Douven claims that Putnam’s principle is not of any help against the incommensurability problem. If the principle only tells us that later theories can be interpreted or treated as advances on truth in comparison to their predecessors, it is far too weak to deal with incommensurability. Therefore it must conclude that later theories are advances on truth in comparison to their predecessors. This however is unjustified (and

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17Putnam (1975a, 1975b, 1975c)
18Douven (2000)
19Putnam (1978, pp. 23–24)
20Douven (2000)
far from satisfactory) since the only support for the principle seems to be that it is able to defend against relativism.

Putnam’s principle can not explain how we can understand terms like ‘phlogiston’, since we cannot establish the reference of this term through a causal chain. And yet we do seem to understand what it means. Apparently Putnam’s principle only gives us an interpretation criterion and does not offer an account of how to establish that there actually is a shared reference. Therefore it needs to tell us something about how the terms refer.

3.3 Kuhn’s response to the causal theory

Kuhn\footnote{Kuhn (1979)} states that, to avoid the problem of meaning variance, many philosophers have stated that truth values depend only on reference (and not in any way on Frege’s sense) and that an adequate theory of reference need not call upon the way in which the referents of individual terms are in fact picked out. The most influential version of this approach is the ‘causal theory of reference’ developed by Kripke and Putnam.

“According to the causal theory, the referents of natural-kind terms like ‘gold’, ‘tiger’, ‘electricity’, ‘gene’, or ‘force’ are determined by some original act of baptizing or dubbing samples of the kind in question with the name they will thereafter bear.”\footnote{Kuhn (1989, p. 78)}

The Causal Theory of Reference offers an alternative to both Frege’s theory of reference and semantic holism. It shows us that Frege’s distinction between sense and reference is not the only possible approach to referential semantics. It also shows that semantic holism need not be the only acceptable option. Since Kuhn’s incommensurability thesis relies on both the assumption of Frege’s sense-reference distinction and semantic holism, the Causal Theory undermines the necessity of incommensurability. Because this alternative theory is raised, it is up to Kuhn to explain 1) why incommensurability nevertheless occurs or 2) why the philosophical foundations on which the incommensurability thesis rests are a better option than their alternative (the Causal Theory), or 3) why the Causal Theory of Reference theory is wrong.

Kuhn opts for the first question and responds by again stipulating that there is indeed a phenomenon which occurs between scientific theories that we can call ‘incommensurability’:

“... successive theories are incommensurable (which is not the same as incomparable) in the sense that the referents of some of the terms which occur in both are a function of the theory within which those terms appear. There is no neutral language into which both of the theories as well as the relevant data may be translated for purposes of comparison.”\footnote{Kuhn (1979, p. 204)}
However, the Causal theory of Reference is at least partially accepted by Kuhn:

“The techniques of *dubbing* and of *tracing lifelines* permits astronomical individuals – say, the earth and moon, Mars and Venus – to be traced through episodes of theory change, in this case the one due to Copernicus.”  

According to Kuhn there are terms that refer in the way proposed by Kripke and Putnam. Kuhn thinks that the Causal Theory could very well be a significant technique for tracing the continuities and revealing the nature of the differences between successive theories. However, not *all* terms refer in the way Kripke and Putnam propose. There still are terms that are interrelated with, and inseparable from their associated theory.

In the previous section we have seen that the Causal Theory is problematic with respect to natural kind terms and theoretical terms. In an argument quite similar to the ‘Tiger’ argument, Kuhn objects to Putnam’s ‘electrical charge’ argument concerning the naming of natural kinds. According to Kuhn pointing to a galvanometer provides no information about the many other circumstances to which the term ‘electrical charge’ refers. For example, ‘electrical charge’ can also refer to the cause of the phenomena in a thunderstorm. This is not exactly the same argument as the ‘Tiger’ example, but its conclusion is nevertheless that in such cases the Causal Theory needs to admit a descriptive element.

Another problem is raised by Kuhn concerning natural kinds. Kuhn argues that there may be such a thing as a lifeline for individual members of a natural kind that can be traced back (such as ‘Mars’ and ‘Venus’), but there is no lifeline for a family of natural kinds (such as ‘Tiger’ or ‘Atom’). Therefore the reference of a natural kind name cannot be traced back in the way Kripke and Putnam propose. Kuhn claims that for determining the referent of a proper name for a member of a natural kind, we only need one act of ostension, while when determining the referent of a natural kind name (the entire family), we need a number of acts of ostension. However, laws and theories (which can be regarded as descriptive elements) also enter into the establishment of reference for natural kinds. Wittgenstein’s famous ‘game’ example shows that to be able to learn (to correctly apply) the term ‘game’, you need to be exposed to different games and also to non-games such as wars and gang rumbles, things to which the term might be mistakenly applied. To learn about ‘cats’ one also needs exposure to ‘dogs’. We learn about the *feature space* and *salience*. There is no more need for a definition or set of essential characteristics (which Kuhn thinks proved to be a hopeless pursuit anyway), but these terms are interrelated and therefore learning about their referents is dependent on theory. Also, because of their unobservable character, theoretical entities are not (directly) ostendible and therefore prove very problematic to a strict Causal Theory.

So, Kuhn’s reaction to Kripke and Putnam’s Causal Theory of Reference is that it might *seem* plausible, but, Kuhn states, it is not clear what exactly is plausible about it. The Causal Theory might very well be an adequate theory for the reference of the names of people and single (observable) entities, but

\[24\text{Kuhn (1979, p. 205)}\]

\[25\text{Wittgenstein (1958, sections 65-78)}\]
what Kuhn thinks is implausible is the Causal Theorist’s treatment of reference of natural kind-names and theoretical terms. The result of the causal theory of reference is that Kuhn is forced to retreat to incommensurability of theoretical terms.\textsuperscript{26} I will elaborate on the resulting ‘local incommensurability’ in the next Chapter.

\textsuperscript{26}Because of their dependence on theory, I will consider natural kind terms to be theoretical terms.
Chapter 4

Further changes in Kuhn’s concept of incommensurability

In the first chapter we have seen Kuhn’s position change from a vague intuition supported by some metaphors borrowed from mathematics and psychology, to a philosophical position concerning referential semantics. As a result of Davidson’s criticism on the idea of the existence of conceptual schemes different from our own, which we examined in chapter two, and Kripke and Putnam’s criticism on both Kuhn’s holistic foundations and the sense-reference distinction, which we looked at in chapter three, we will now see another change in Kuhn’s position.

Davidson’s common-sensical ‘naturalistic’ approach does not directly attack Kuhn’s holistic foundation, nor does it attack Kuhn’s acceptance of Frege’s sense-reference distinction. Instead it offers a view on language that opposes the idea of the existence of any form of (large-scale) semantic relativism, including incommensurability. Kuhn defines incommensurability as a problem of translation. Davidson argues that there is no such thing as an untranslatable language (neither partial nor whole) and that therefore we have no reason to assume the existence of conceptual schemes (which can be said to be more or less the same as Kuhn’s paradigms) that differ from ours (the entire idea of a conceptual scheme that differs from ours is even unintelligible according to Davidson).

Davidson’s theory hinges on Quine’s idea of radical translation. Of course, Kuhn reacts to this by saying that Quine’s radical translator is in fact an interpreter. Interpretation should not be confused with translation and Kuhn claims that it is the impossibility of strict (or perfect) translation that was meant with incommensurability. Kuhn thus admits that both approximate translation and the partial salvaging of any possible communication-loss by means of interpretation are possible and thereby weakens his position considerably.

Instead of the large-scale miscommunication between people of different cul-
tures or scientific paradigms (because of these people living in ‘different worlds’), we now only have a slight miscommunication where the ‘translation’ between these people’s languages fails due to a difference in their theoretical background. Davidson argues that it is unintelligible to assume that someone can have a set of beliefs that differ radically from ours (since we wouldn’t be able to establish this), so a large part of this person’s theories (including everyday beliefs, such as ‘when it rains you get wet’) will overlap with ours. This suggests that incommensurability is not an issue which occurs in everyday contexts, but which will mostly appear in the context of detailed theoretical discussion, where the meaning of terms is (inter)defined by this theoretical context. This, of course, would be the scientific context of pre and post-revolutionary (scientific) paradigms that Kuhn already talked about in the *Structure*. This means that Kuhn’s main claim, that of the incommensurability of scientific theories, is upheld.

Although Davidson’s arguments may be plausible for everyday beliefs or theories about observable objects and the properties of these objects, there is plenty of evidence in the history of science (and other theoretical history, such as that of religion for example) that people can have radically different theories. As long as we can associate behaviour and speech activity with observable objects, features or phenomena, Davidson definitely seems to have a point. But as soon as the object under discussion becomes unobservable or theoretical, certain terms from the language that is spoken become interdefined by the theories the speakers hold to be true about that object. It is this (interdefined) theoretical terminology that is incommensurable according to Kuhn.

This idea of the incommensurability of interdefined theoretical terminology is not opposed by the arguments raised by Kripke and Putnam in their Causal Theory of Reference. Kripke and Putnam present a theory that explains how the names associated with observable objects or kinds are fixed through an act of baptizing. Although not every aspect of this approach seems equally plausible, it shows us that the meaning of names is not some sort of definition. This makes total holism a very implausible idea. As we have seen in the previous chapter, the causal theory is quite problematic for natural kind terms and other terms whose meaning is likely to involve theory (such as a descriptive element). Because we cannot simply baptize unobservable objects by pointing at them (like the objects postulated by science), the causal theory does not tell us a lot about how to avoid incommensurability of theoretical terminology.

### 4.1 Local holism and local incommensurability

Because of the impact of both Davidson, and Kripke and Putnam’s arguments, which show us the absurdity of large-scale miscommunication, Kuhn can now only admit a *local holism* instead of defending a total holism. This local holism would appear in fields where the meaning of terms is largely or totally dependent on their (theoretical) context and where their meaning is thus interdefined.

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1 I use the terms unobservable and theoretical in the following way: The term ‘unobservable’ implies that an object does exist, but that we cannot observe it (which means that talking about them is theoretical). The term ‘theoretical’ implies that an object might or might not exist, but it may be observable (like observable natural kinds).

2 Kuhn, of course, claims he never meant anything else.
Local holism and local incommensurability

“many of the referring terms of at least scientific languages cannot be acquired or defined one at a time but must instead be learned in clusters.”

Although incommensurability due to the interrelatedness of terms is likely to occur mostly in theoretical terminology, Kuhn also provides some examples of its occurrence in more everyday terminology.

“... both ‘doux’/‘douce’ and ‘esprit’ belong to clusters of interrelated terms, a number of which must be learned together and which, when learned, give a structure to some portion of the world of experience different from the one familiar to contemporary English speakers. Such words illustrate incommensurability between natural languages.”

However, interdefinition and the resulting incommensurability are more likely to occur within theoretical scientific terminology. For example, one cannot learn how to use Newtonian ‘force’ and ‘mass’ separately from each other, nor can one learn this without learning about Newton’s second law of motion, etcetera (actually, in his ‘Afterwords’ to the ‘The Road Since Structure’ Kuhn claims ‘force’ can be acquired without ‘mass’, but it still cannot be learned without concepts such as space, time, motion and material body). Not even all terms in scientific theories would be subject to holism. Many will have their meaning defined by observable objects or features. Only for a small selection of largely or totally interdefined terms would local holism and the resulting untranslatability and incommensurability arise.

“most of the terms common to the two theories function the same way in both; their meanings, whatever those may be, are preserved; their translation is simply homophonic. Only for a small subgroup of (usually interdefined) terms and for sentences containing them do problems of translatability arise. The claim that two theories are incommensurable is more modest that many of its critics have supposed.”

Kuhn calls this more modest version of incommensurability ‘local incommensurability’. This local incommensurability is still quite a threat to comparability and translatability between different theories.

“Meanings are a historical product, and they inevitably change over time with changes in the demands on the terms that bear them. It is simply implausible that some terms should change meaning when transferred to a new theory without infecting the terms transferred with them.”

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3 Kuhn (1983b, p. 211)  
4 Kuhn (1983a, p. 49)  
5 Kuhn (1983b, p. 211)  
6 Kuhn (1983b, p. 248)  
7 Kuhn (1983a, p. 36)  
8 Kuhn (1983a, p. 36)
4.2 Taxonomic incommensurability

Towards the end of his life (from the late 80’s until his death in 1996) Kuhn presented yet another version of the incommensurability thesis, which can be seen as a refinement of the ‘local incommensurability’ thesis. Kuhn calls this last version of incommensurability ‘taxonomic incommensurability’ and it is an attempt to refine the ‘local’ version of the thesis by explaining the linguistic structure underlying both the concept of theory comparison and that of incommensurability. This can of course be seen as an attempt to defend the idea that incommensurability is an intelligible concept (an idea which Davidson opposed, as we have seen in Chapter 2).

A taxonomy is basically the same thing as what was earlier denoted as ‘paradigm’ and ‘conceptual scheme’, but because of their implications (and associations with earlier versions of Kuhn’s theories) Kuhn decides to use this new term. A taxonomy is the systematic classification of the objects, phenomena, etc. by scientific theories into various categories.

Kuhn claims that when a scientific theory changes, so will the taxonomic system that belongs to it. The criteria that belong to a certain category in one theory are different from that of another theory. Therefore, things are classified differently in different theories. For example, the sun was once considered to be a planet, while modern science now considers it to be a star. This means that with the change of theories, objects can be classified differently and taxonomical categories can be introduced (or disappear). According to Howard Sankey, this means that on a semantic level, new vocabulary can be added that varies semantically from the previous vocabulary. It is also possible for the original vocabulary to be maintained, while its criteria of categorization are altered. This would of course result in communication loss between users of the old vocabulary and users of the new vocabulary.

“However, in many cases the original vocabulary is preserved through change of taxonomy, and is therefore subject to change of meaning. Where a change affects the criteria by means of which a category term is applied, such change may alter the sense of the term. But in cases in which objects are also transferred from one

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9 Actually Kuhn keeps changing his terminology; “What I have been calling a lexical taxonomy might, that is, better be called a conceptual scheme, where the ‘very notion’ of a conceptual scheme is not that of a set of beliefs but of a particular operating mode of a mental module prerequisite to having beliefs, a mode that at once supplies and bounds the set of beliefs it is possible to conceive.” Kuhn (1991, p. 94), but to avoid confusing the term with Davidson’s, I will continue using the term ‘taxonomy’.

10 Sankey (1998, p. 3)
taxonomic category to another, the retained terms may undergo change of extension as well.”

Kuhn admits that not the entire taxonomic scheme needs to change with the change of one theory to another. But a change in the taxonomic scheme could very well mean that there is change of meaning (in the way earlier described as local holism; because of the interdefined relation of terms with their taxonomic category). This makes it impossible to exactly translate terms from one theory into the other and this is what Kuhn calls (local or taxonomic) incommensurability. This interdefined relationship of theoretical terms with their taxonomical category is, for example, why the term ‘phlogiston’ has no translation in the vocabulary of modern physics. In modern physics there is no term that has the same relationship with the taxonomic structure as the term ‘phlogiston’ had (in its contemporary science). There simply is no overlap in the taxonomies.

“As a result of translation failure due to the holistic interdefini-
tion of category terms, incommensurability emerges as a localized
phenomenon, restricted to narrow subsets of terms within alterna-
tive theories.”

Because of the close relationship of terms with their taxonomic categorization, the incommensurability of terms is quite likely to occur with (natural) kind-terms (which can be seen as a typical example of taxonomic categorization, besides being highly theoretical). We have already seen that one of the main problems of Kripke and Putnam’s theory lies with natural-kind terms.

Kuhn claims only to be concerned with the meanings of a restricted class of terms when talking about incommensurability, namely taxonomic terms or kind terms (which include natural kinds, artifactual and social kinds, and probably some others). Kuhn claims there needs to be a no-overlap principle for natural kinds. No two kind terms may overlap in their referents unless they are related as species to genus (no dogs are also cats, this is what makes dogs a natural kind, but dogs can also belong to the natural kind ‘mammals’, which is a category that includes several natural kinds). According to Kuhn, one cannot simply enrich the set of category terms when one encounters something new but one must redesign part of the taxonomy (therefore ‘water’ does not always refer to \( \text{H}_2\text{O} \), such as in Putnam’s famous ‘twin earth’ example, where it refers to XYZ within the taxonomy of the twin-earthians). Two speech communities having taxonomies that differ in a certain area can therefore not just adjust their lexicon by adding a kind term that overlaps (shares a referent) with one already in existence. Incommensurability therefore boils down to untranslatability between communities with differing lexical taxonomies.

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11Sankey (1998, pp. 3-4)
12Sankey (1998, p. 5)
4.3 Linguistic structure as a basis for comparing theories

Because of the local character of Kuhn’s taxonomic version of the incommensurability thesis, Kuhn uses the commensurable part between two theories or languages to explain how both theory comparison and talk of incommensurability can be made intelligible.

Kuhn claims that it is the common or overlapping part of two taxonomic structures, belonging to two theories, that makes it possible to compare these theories and communicate across them. It is where the taxonomies differ that communication problems and comparability problems ensue due to incommensurability. In order to be able to translate (and thus to be able to compare two theories), the taxonomic structure belonging to two theories must be preserved with a theory change. It is the overlap in taxonomic structure that makes translation possible.

According to Kuhn, a taxonomic structure mirrors the world (therefore people that have different taxonomies live in different worlds). To be able to translate one language into another, it must be possible to replace terms from one by terms of the other. Therefore, to translate another language into our own, both taxonomic structures must mirror the world in the same way. If the linguistic structure is equal, all we have to do to translate is find out what words we must substitute. Of course different theories can differ in the way they determine a term’s referent. According to Kuhn, it does not matter if reference is fixed differently in each theory (for example, people can use different criteria in picking out the same referent, even within the same taxonomy). As long as the taxonomy is homogenous, translation is possible.

“In matching terms with their referents, one may legitimately make use of anything one knows or believes about those referents. Two people may, moreover, speak the same language and nevertheless use different criteria in picking out the referents of its terms.”

People can associate different things with a word and therefore use different criteria in picking out the same referent. As we have seen earlier, words can be associated with descriptions. These descriptions can differ with each individual and can be used to pick out a referent. It is the common linguistic structure (the taxonomy) that makes people refer to the same things (if the taxonomy is overlapping).

Although taxonomies can overlap and make people talk about the same things, this does not mean that taxonomies provide a neutral basis for communication. That a term preserves its meaning across a theory change does not necessarily mean that it is not interdefined. It can very well be that it is (inter)defined in the same way in the new theory as in the old one.

Davidson claims that talking of both translatability or theory comparison and incommensurability is necessarily incoherent (since one cannot intelligibly talk

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13Kuhn (1983a, p. 50)
of something being translatable and untranslatable at the same time). According to Kuhn, however, it is the terms that do preserve their meaning across a theory change that provide a basis for coherently talking about differences in the theories. These terms can even help us make sense of incommensurable terms. According to Kuhn, this shared part of the language is what makes Davidson’s argument fail (after all, it seems possible to establish that two terms are incommensurable and that this is because the terms have different meanings, and it also seems possible to say how their meaning varies by means of descriptions, approximations, etc.).

According to Kuhn, when comparing different theories, the criteria for determining the referents of scientific terms depend on the structural relation between kind terms and are vital to the precision of scientific generalizations.

“The lexicons of the various members of a speech community may vary in the expectations they induce, but they must have the same structure. If they do not, then mutual incomprehension and an ultimate breakdown of communication will result.”

Kuhn explains how incommensurability is (still) a threat to scientific realism. The realist claims that successive theories are closer to the truth (in general). Kuhn argues that the taxonomic version of incommensurability still threatens this claim. Those who share a (lexical) taxonomic structure can understand each other, those who do not seem to disagree with each other, but will in fact not comprehend each other because they are using the same terms for different kinds. This is what incommensurability is about. This means that where the taxonomies of two theories differ, there will be incommensurability, and because it is impossible to translate the language of one theory into the language of the other, the two theories cannot be precisely compared. This means that one theory cannot be said to be closer to the truth than the other.

Since theories involve interdefined terms, and theories differ, we can no longer be certain that the same thing is meant with equal word-signs from different theories. It is therefore up to the realist to explain why it is that science is nevertheless cumulative.

“On the one hand, I aim to justify claims that science is cognitive, that its product is knowledge of nature, and that the criteria it uses in evaluating beliefs are in that sense epistemic. But on the other, I aim to deny all meaning to claims that successive scientific beliefs become more and more probable or better and better approximations to the truth and simultaneously to suggest that the subject of truth claims cannot be a relation between beliefs and a putatively mind-independent or “external” world.”

That truth claims are meaningless is a result of incommensurability. There simply is no shared metric available and we are thus unable to say if one assertion is better or closer to the truth than another. In other words, we could be closer

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14Kuhn (1993, p. 239)
15Kuhn (1993, p. 243)
to the truth, but as we cannot be sure we are, all statements concerning this are meaningless.

4.4 The observational – theoretical distinction

A distinction that I have not explained explicitly but which may raise questions, is the distinction between theoretical and observational terminology. Because of theories about the theory-ladenness of observation (which originate from Logical Positivism), it is assumed that this distinction is no longer valid. Since all observation is supposed to involve theory, it is impossible to observe without making any theoretical assumptions. Therefore, one can no longer distinguish between observational and theoretical terms.

However, in discussions concerning recent philosophy of science the distinction has often re-appeared in a more empirical approach (which is not to be confused with the older distinction). There are simply things we can see, and things we cannot see. Theories about things we cannot see lead to ‘theoretical’ terminology. For example, Bas van Fraassen introduced a skepticism about unobservable entities, and thereby draws a line between the observable and the unobservable (which leads to talk of theoretical entities). The distinction in this thesis is not meant to challenge the idea of theory-laden observations and a resulting theory-laden vocabulary. Kuhn probably even agrees with the idea of theory ladeness (and incommensurability is certainly seen as a thesis about theory-ladenness). It is meant in a more practical way to indicate that certain terminology from scientific theories is dependent on these theories. Their meaning is largely or totally defined by them. Other, more ‘common’ terminology need not necessarily be (for example the terms Kripke and Putnam talk about in their causal theory). Still it is strange that Kuhn uses the distinction to save part of his theory. I think this distinction can be bypassed by just talking about interdefined terms. That these terms are mostly found in scientific theories makes talk of ‘theoretical terms’ a useful metaphor. In Section 5.3 we will see that Kuhn tries to argue for the incommensurability of certain interdefined terms from every-day speech. I will argue against this.
Chapter 5

Personal views on the incommensurability discussion

We have seen that, in *Structure*, Kuhn starts out with the idea of incommensurability, which at that time is no more than an intuition. Kuhn develops his idea into a full philosophical theory of semantics. This theory involves the acceptance of both semantic holism and Frege’s sense-reference distinction. The main two counter-arguments, delivered by Davidson and by Kripke and Putnam, managed to show that the strong interpretation of incommensurability (that of large-scale or total communication breakdown) is absurd. Kuhn is then forced back into a theory of local incommensurability (due to a local holism). Since the criticism of Davidson and Kripke and Putnam relies on the observational character of names and their referents, Kuhn is able to maintain his theory for terms that are largely or totally interdefined (the terms whose meaning is defined by their associated theory). In this last Chapter, I will present my personal views and criticism on several aspects of the incommensurability-discussion as it was explained in the previous chapters.

This thesis covers the arguments that were delivered by the main proponent and opponents of the incommensurability thesis. Any literature by authors of secondary texts was mainly used to clarify the arguments that were delivered and the positions that were taken by the main authors. There has, however, been written a lot of very interesting secondary literature during the past 40 years. Some of this literature was merely mentioned, and some of it was discussed in more detail when I was considering the problems surrounding Davidson’s position and the problems with the Causal theory of reference. There have been countless other publications concerning the subject of incommensurability that are very interesting, but which I did not mention (before) in order to keep this thesis readable and clear. A lot of the arguments against the incommensurability thesis that were published are versions or refinements of the arguments delivered by Davidson or by Kripke and Putnam.
An argument (quite similar to Davidson’s claim that the concept of incommensurability is unintelligible) that is often encountered is that Kuhn claims two theories to be incommensurable, while at the same time he is able to explain why they are incommensurable. According to many authors this is paradoxical, since incommensurability implies incomparability, and if Kuhn is able to explain why two theories are incommensurable in the same language, this means there is a basis for comparison.

A similar argument is delivered by W. H. Newton-Smith.\(^1\) Kuhn claims that two theories can be both incompatible and incommensurable at the same time.\(^2\) To establish that two theories are incompatible presupposes that there is a ground from which to compare the two. If we now state that they are also incommensurable, we state that we cannot compare the two (which means that we cannot say if the two are incompatible).

Most arguments in defence of the thesis are attacks on either Davidson or on the causal theory of reference. The most interesting of these were discussed in Chapters 2 and 3. Other arguments include versions and (mostly very specific) refinements of the incommensurability thesis.

Now I will discuss my personal views on the subject. In Section 5.1, I will view the formalization of Kuhn’s early position, and explain why it is not a very powerful formalization. In Section 5.2, I will explain the criticism I have on Davidson’s ‘principle of charity’. In the following Section 5.3, I will criticize Kuhn’s attempt to argue for the incommensurability of every-day speech, and present a view that allows a reformulation of Davidson’s ‘principle of charity’ and simultaneously restricts Kuhn’s application of taxonomic incommensurability.

### 5.1 Holism and Frege’s sense-reference distinction

In Chapter two, we saw that Kuhn formalized his earlier intuitions about incommensurability by combining two premises, namely the idea of semantic holism and Frege’s sense-reference distinction. The result of this is that two identical terms (word-signs) belonging to different theories (or cultures) have a different sense. Since in Frege’s theory a word’s sense determines its reference, Kuhn claims that these word-signs might refer to different objects. Kuhn even suggests that this is actually the case. If two word-signs refer to different objects, two people using the different signs will seem to communicate and disagree, but they will in fact equivocate (they talk past each other, which results in communication breakdown).

Kuhn’s formalization, and its implications are not as strong as they sound, however. As we saw in Chapter 1, Frege’s ‘Morning Star – Evening Star’ example shows us that it is possible for two terms with a different sense to have the same reference (in this case they both refer to Venus). This can then also be the case for other pairs of (scientific) terms with a different sense. It is not possible to conclude from the premises that these terms each necessarily refer

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\(^1\)Newton-Smith (1981)
\(^2\)See quote on p. 4
to something else. Incommensurability is therefore certainly not a necessary outcome of accepting semantic holism and Frege’s sense-reference distinction, but merely a possibility.

It is often assumed that it is meaning-variance (i.e. terms having a different sense) that causes the kinds of communication breakdown, or untranslatability that Kuhn talks about. Frege showed us that meaning is not the same as reference, since ‘Morning Star’ and ‘Evening Star’ have different cognitive values. Terms with the same meaning need to refer to the same object, but terms with the same reference need not have the same meaning. Because terms with different meanings can also refer to the same objects, the assumption that incommensurability is caused by meaning-variance is false.

Incommensurability cannot be defended on the mere basis of semantic holism and Frege’s sense-reference distinction, since it only shows us that miscommunication might occur, not that it actually occurs. However, Kuhn’s formalized version of the incommensurability thesis does show us that the claim of the scientific realist is not airtight. After all, it is the scientific realist who claims that science is cumulative, which presupposes that scientists in pre- and post-revolutionary science refer to the same objects when using the same terms. Kuhn’s argument must therefore be seen as a form of skepticism concerning scientific realism. Kuhn sketches a scenario that shows us that communication cannot be taken for granted, and he thereby questions the realist’s claim. It is up to the scientific realist to defend this claim, and come up with an argument why scientists can nevertheless be regarded as talking of the same entities, how we can judge one of two different theories to be closer to the truth, why incommensurability can (or does) not occur, or why incommensurability does not threaten the realist’s claim.

5.2 Davidson’s peculiar principle of charity

Although the main line of Davidson’s argument seems to be very reasonable and appeals to our Common sense, the argument contains specific details which are quite strange. The most striking of these is the appeal to a ‘principle of charity’. This principle states that if we want to understand others, we must count them right on most matters. According to Davidson we need the principle to be able to communicate (by means of interpretation).

This principle of charity strikes me as highly dubious. The principle of charity tells us we need to assume speakers of different cultures to be right on most matters. This, of course, is very convenient to Davidson. First of all, it gives people a basis for interpreting others (because it tells us that other people speak about the same phenomena), and then it tells us that what these people have to say about these phenomena is actually true in most cases. It is no wonder then that Davidson can conclude that people of a different culture do not have a conceptual scheme different from ours (if two cultures can’t generally be wrong when talking about the same phenomena, they must be telling basically the same thing).\(^3\)

\(^3\)See Chapter 2
\(^4\)Assuming that there is only one truth.
In Section 5.3 we will see that I agree with Davidson that we have to assume that other people speak about the same phenomena. However, I doubt that we actually have to accept that they are right on most matters. It seems to me that people cannot simply be regarded as being right or even mostly right in most matters. History has shown us through countless examples that people can often be regarded as being wrong. For example, for many centuries people have believed that the earth was flat. Quite recently science has proven this belief wrong. One can easily see that the ideas of entire cultures can be wrong. A lot of the ancient cultures (Aztec, Egyptian, etc.) revolved around theological beliefs. Even when one of these was actually right there have been so many different views that most of them can be considered to be wrong. When reading ancient texts, a large number, or even most of these are about religious subjects (even when talking about events in daily life they involve religious aspects).

Since this debate is about past sciences as well as different cultures, we must be careful not to say that all past science was wrong. I think Kuhn is right in stating that these sciences must not be judged from the perspective of modern science, but must be judged from their contemporary perspective. It is therefore not very easy to simply call these sciences wrong. It is, however, also not possible to simply regard these past sciences as right.

It can be argued that what Davidson means with ‘most matters’ is that there are more every-day beliefs that are to be considered true than the theological (or theoretical) beliefs I just described. But I wonder if Davidson is justified in this belief. As an empiricist, Davidson has to stick to the evidence. What if most things we read about an ancient culture involve religion (one that we can reasonably regard to be untrue)? Both empirically and epistemically speaking, we are not justified then in claiming that this culture is right in most matters (because we simply do not know what their other beliefs were, and evidence tells us most beliefs were false). Nevertheless we seem to be able to interpret these texts.

Although I am willing to admit that native speakers intend to utter true sentences, and are indeed convinced of the truth of their utterances, I oppose that we should accept that they are right on the actual matters. We can easily come up with examples of utterances from a native language that include (false or non-sensical) religious terminology, for example statements about lightning being the manifestation of the anger of the Gods or statements about sacrifices pleasing the Gods. The ancient languages we know of consist to a great extent of religious expressions. Since we can hardly agree on lightning being caused by the anger of the Gods, it is very easy to call such an expression false. If this is correct, most expressions that we know of such a language will have to be considered false.

If the lives of people in a certain culture revolve around a religion, a lot or even most of their expressions will involve religious terminology. If that religion can be considered false, we can assume that a lot or most of the expressions will also be false (or non-sensical). We know that there were cultures that revolved around (false) religions, so we can assume that a lot or most of their expressions were not true (either false or non-sensical). Still we can interpret these lan-
guages, and we can understand them even though they are false. We only need to assume that something (some proposition) is being expressed. We even have to be able to understand such a proposition. In the case of something supernatural or religious being expressed, we simply say, “these people have the belief that such and such”. It thus seems far more reasonable that by interpreting we can find out what an utterance means, and we can then establish that it is either wrong or right. We can even establish that some native community’s beliefs and truth claims are mostly wrong. Truth therefore, has nothing to do with interpretation, but only comes afterwards in the evaluation of the expressions.

Davidson is therefore not justified in the assumption of his ‘principle of charity’, that states that we have to consider people of different cultures right on most matters. This principle needs either re-formulation or needs to be discarded. In the next section I will suggest an approach to the incommensurability discussion that allows a reformulation of the principle.

5.3 Incommensurability of everyday terms

Due to Kuhn’s approach to incommensurability as a result of the interdefinition of terms, incommensurability of theoretical terminology seems to be quite defendable and sensible. Kuhn, however, tries to argue for the untranslatability of terms from every-day conversation as well. It is here that I think Kuhn is mistaken.

Kuhn claims that the correct translation into English of the French term ‘esprit’ depends on the context. Translation of ‘esprit’ can differ between ‘spirit’, ‘aptitude’, ‘mind’, ‘intelligence’, ‘judgment’, ‘wit’ or ‘attitude’. This word is not ambiguous, but according to Kuhn there is a conceptual disparity between French and English. English contains no unitary equivalent of the French term. Kuhn claims that none of the English terms above is an intensionally correct translation of the French term in every case. Also the English terms introduce a new intensionality that is not included in the term being translated. Therefore Kuhn claims that these kind of terms are untranslatable.

Kuhn then argues that this untranslatability also applies to sentences containing these terms. For example, according to Kuhn, the English statement ‘the cat sat on the mat’ is impossible to translate into French (because of the incommensurability between the taxonomies for floor covering). For each case in which the English statement is true one can find a coreferential statement in French, but there is no single French statement that refers to all and only to the situations in which the English statement is true.

So we see that Kuhn first takes intensionality to render translation incorrect, and then argues that translatability is impossible because of statements not meaning the same in each and every situation. Apparently Kuhn demands that something can only be a correct translation when it is a unitary equivalent.

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5Kuhn (1983a, p. 48)
5.3. **Incommensurability of everyday terms**

5.3.1 **Doubts on the necessity of unitary equivalents**

While Kuhn keeps emphasizing that the meaning of certain (separate) terms often relies on their context, he now seems to be concerned with the meaning of these same terms in isolation. I agree with Kuhn that context does indeed fix the meaning of certain terms. The problem of the terms whose meaning is dependent on this context is that the context that determines their (exact) meaning is missing when they are looked at in isolation. I think it is strange for Kuhn to demand a ‘perfect’ translation of these terms.

I think we cannot sensibly say that such terms have a meaning when taken in isolation (although we can tell what their meaning is in various different contexts, “this term could mean such and such, or it could mean . . .”, this is what we see in dictionaries). It is not very interesting to now suggest that such terms, whose meaning is not fixed, are not translatable. Since the context does matter, we should not insist on translation of single words to single words in another language. Instead we should look at complete sentences, in which these terms have a (more or less) fixed meaning, to determine the various meanings these terms can have. Because of the subtle nature of context and the intensionalities involved, I suggest that we need to look at the *propositions* expressed by these sentences. Once we can translate entire sentences, we can construct a translation manual consisting of their separate words and the different words they can be translated into in different contexts.

A proposition is that what is expressed by a sentence, the ‘thought’ of a sentence. It is possible for sentences from different languages to express the same proposition, for example “snow is white” and “sneeuw is wit” express the same proposition. Since sentences express our experiences, and therefore reflect the situations in the world, a proposition expressed in two different languages deals with describing (largely or totally) similar situations.

The expression of similar situations by speakers from different cultures is what I think should have been the main purpose of Davidson’s ‘principle of charity’. We do not have to accept that people are ‘right on most matters’, it certainly does not seem sensible to believe that people are always or very often right, (It even seems arguable that people always differ in opinion, and only one or a very few of them are actually right). The only thing we do have to presuppose in order to start interpreting others, is that they are describing something that is similar, or indeed contains only elements that are similar, to things we have experienced or are experiencing. Only if someone is describing a situation which we are also able to describe do we have a basis for comparing expressions. We do not immediately understand the words a person of another language community is using. It is only when a proposition (that we can also express) is expressed that we can start interpreting. If both expressions express the same proposition, we might as well call these a translation (since the same proposition is expressed, the empirical consequences of an expressions will also be the same). So in the case of the sentence ‘the cat sat on the mat’, there is a proposition expressed (namely that an object A, which we call ‘cat’, was on object B, which we call ‘mat’). This proposition is certainly also expressible in French since both objects can be denoted with an appropriate term (that leaves no more doubt to what is referred to than the English expression does).
Kuhn, however seems to be arguing that because the word ‘mat’ has several other meanings, this somehow leads to communication-loss. This argument seems to be the result of a confusion on Kuhn’s behalf. Kuhn’s incommensurability thesis is about communication, or communication-loss. When one situation can be described in two languages (with an equal amount of uncertainty of what situation the expression denotes), there seems to me to be enough basis for communication, namely, the propositions expressed. Kuhn, however, argues that the term ‘mat’ is not in each and every possible case of its use substitutable by a French term. Kuhn thinks that translation of single terms needs more than just preservation of reference. It must also preserve intension (or sense). Kuhn claims that certain French words are not intensionally correct translations of the English word ‘mat’, and thinks this is enough reason to conclude that the term is untranslatable.

If each and every situation is expressible with a sentence in both languages, those sentences can be substituted to translate both languages into each other. I agree with Kuhn that this might lead to translation difficulties where the making of translation-rules or manuals is concerned. After all, there is no unitary equivalent of every French term in English and vice versa (some words might even need an entire description to translate, but although Kripke and Putnam have argued that the meaning of a word is not the same as a description, it is very well possible for a word and a description to have the same meaning).

It is of course not the words themselves that are true (or false), but the proposition expressed. This means that although we perhaps do not have the exact synonym for the English term ‘mat’ in French, we probably have some word or description that applies in each single situation. In an unambiguous single expression, there is only a single proposition expressed. I think this proposition includes the intensionalities that are relevant for communication. If this is so, it does not matter if a specific French word is not applied in each and every case the English word is, as long as there is a word or sentence that expresses the same proposition. If each proposition concerning mats in English can also be expressed in French it does not matter that it is the exact same word in both languages each time. This means that although a single word could be seen as not exactly (unitarily) translatable (and thus incommensurable, per definition), each sentence can be translated and is thus commensurable. Therefore Kuhn’s idea that sentences containing incommensurable terms are also incommensurable is mistaken.

It remains to be defended that the necessity for unitary equivalents is an issue in the course of actual translation. If something is actually translatable, it cannot be called untranslatable (even though it can be difficult) and if these languages are still incommensurable (because for some reason we would like the definition of incommensurability to include a necessity for unitary equivalents) this will certainly not be a reason to suspect communication-loss. Therefore, incommensurability is not an issue where every-day speech is concerned.
5.4 Concluding remarks

Kuhn’s final version of the incommensurability thesis is much weaker than the earlier versions. Still the thesis questions the realist’s claim. It is up to the realist to come up with a defence against it. Kuhn is able to maintain the position that largely or totally interdefined theoretical terminology is untranslatable. Therefore theories containing such terms will be untranslatable and incomparable. It seems unlikely that incommensurability will occur with terms from every-day speech and sentences containing these terms. Kuhn expects translation between two languages to be unitary equivalent. Translation thereby becomes a very strict concept. I argue that this is not necessary for the actual translation of every-day speech to demand this. If actual translation is possible, incommensurability is not a threat to every-day communication.

Kuhn’s taxonomic incommensurability seems to be only applicable to certain specific parts of theoretical terminology, where the meaning of terms is largely or totally interdefined. This makes the final version of the incommensurability thesis interesting and important for discussions about theory comparison, and therefore for discussions about scientific realism.
Bibliography


