

Language, Computer Sciences and Tacit Knowledge

There are various conceptions of the nature of language in circulation in linguistics. Common to all of them is, however, some reliance on the concept of rule, explicit or implicit. Typical in this respect is the remark of Jerrold Katz in *The Philosophy of Language* where he contends that "one who knows a natural language *tacitly* knows a system of rules".¹ A natural as well as a constructed language is conceived as a system of rules in some sense. On the syntactical level this does not seem to meet with unsurmountable difficulties. On the semantical level the situation is far more problematic. It is for instance basic to Katz' conception of language that rules also are constitutive of linguistic *meaning*. And some version of this idea has to be correct if the more ambitious aims of the computer sciences be realized, as one is here radically dependent upon the possibility of translating the meaning of each and every linguistic expression into a set of machine readable rules which are formulated in such a way that there is a definite answer to any possible case of application.

Ludwig Wittgenstein developed his own version of this idea of language in his *Tractatus Logico-Philosophicus* where he made an intriguing attempt at grasping the relation between language and the world based upon the assumption that language can picture actual and possible states of affairs in the world in virtue of having logical

¹ Jerrold J. Katz, *The Philosophy of Language*, Harper & Row, New York, 1966, p. 100. The emphasis is mine.

form in common. Essential to this picturing relationship was a general rule of projection:

A gramophone record, the musical ideas, the written notes, and the sound-waves, all stand to one another in the same internal relation of depicting that holds between language and the world.

There is a general rule by means of which the musician can obtain the symphony from the score, and which makes it possible to derive the symphony from the groove on the gramophone record, and (...) to derive the score again. (...) That rule is the law of projection that projects the symphony into the language of musical notation.²

In the *Tractatus*-period a proposition was for Wittgenstein a picture of reality, and the supposed method of projection was to think out the sense.³ Later he came to realize that he had confused the method of projection with the lines of projection.⁴ Nevertheless, these few remarks should suffice to indicate that a special concept of rule was

² The reference is to *Tractatus Logico-Philosophicus*, translated by D.F.Pears & B.F.McGuinness, Routledge & Kegan Paul, London (1961), 4.014 and 4.0141. In the sequel I am going to refer quite extensively to central writings from Wittgenstein's *Nachlaß* that have been edited and published as separate works. I shall use the following more or less conventional abbreviations for his writings:

- T = *Tractatus Logico-Philosophicus*, Oxford (1922).
- PI = *Philosophical Investigations*, Oxford (1953).
- OC = *On Certainty*, Oxford (1969).
- PG = *Philosophical Grammar*, Oxford (1974).
- ROC = *Remarks on Colour*, Oxford (1977).
- RFM = *Remarks on the Foundations of Mathematics*, Oxford, 3. revised edition (1978).
- C&V = *Culture and Value*, Oxford (1980).

³ T, 4.021 and 3.11.

⁴ Peter Winch tells us that Wittgenstein once made a remark to this effect in conversation with Rush Rhees. See his article "The Unity of Wittgenstein's Philosophy" that serves as an introduction to the volume, *Studies in the Philosophy of Wittgenstein*, London (1969), which he himself edited. At pp. 12-13 Winch tries to spell out what might be involved in confusing the method of projection with the lines of projection in this context as that is far from clear.

to be found at the very heart of Wittgenstein's theory of how language and the world were related. In addition comes the general use this concept had in logic.

In a linguistic version this idea was also exploited by the logical positivists. Thus we see that the concept of rule was a basic tool in the philosophical tradition for understanding both the nature of language in general and the character of concepts in particular. Such an approach is still very much alive in certain quarters as indicated earlier. Against this background it is easily understood that an explication of the main content of what is involved in Wittgenstein's analysis of rule-following behaviour and rule-governed activities is not merely of exegetical interest to the Wittgensteinian scholar. It has in fact wide ramifications for all those scientific enterprises that essentially involve or are based upon some particular conception of the nature of concepts and the human language.

This set the scene for Wittgenstein's interest in rule-following behaviour and rule-governed activities in his later philosophy. His former rationalistic conception of the nature of language is there turned into a pragmatic concern for the application of the rules that he earlier saw as essential to the nature of language. When he finally discovered that he had confused the method of projection with the lines of projection he also came to see that the *use* of language was not something that was only contingently related to its nature: It should instead be thought of as constitutive of it. This explains why he is so obsessed with the fact that a rule does not dictate its own application.

But he also operates with a much wider concept of language than the one he worked with in *Tractatus*. In his later philosophy he includes such things as gestures, facial expressions, posture, the atmosphere of the situation, as well as such situationally determined actions as, for example, smiling and nodding to an acquaintance as we are passing, turning one's back on somebody and going off without

saying a word, standing on the quay and waiving goodbye to friends, sitting in a restaurant and making a discreet sign that the waiter's presence is desired, attending an auction and making an offer with a little hand movement, etc.

This extended concept of language is aimed at capturing all the means we make use of in our day-by-day situations to make ourselves understood. In the pragmatic perspective it is quite natural to make such things part of the concept of language, since they are all sense-making means in the situations in which we use or react to a sentence with understanding. If this seems far-fetched you just need to remind yourself of the fact that a sentence does not say, of itself, that it is to be taken as, say, an assertion. Other elements in the situation must be understood in a certain way if this is to be the natural response to it. The very same sentence could in different contexts express quite another thought content. Take for instance the sentence: "Laurence Olivier was convincing as Hamlet". It may be used to convey many different types of thought content depending upon the wider context in which it is employed. Let me just indicate a few of them:

1. It could be used to convey a description of his interpretation of the Hamlet role in the contextually implied production.
2. It could be used to give expression to a certain interpretation of his performance in a naturalistic perspective.
3. It could be used to evaluate both his interpretation of the role and his performance of it.

These are logically speaking very different types of thought content that must be kept apart lest confusion should arise. But if we do not

know the closer details of the current use-situation, we will not be able to make up our minds about what is actually said. From this it follows that our mastery of a natural language must include a kind of grasp or practical understanding of an enormously large repertoire of situations involving the use of language. One must know what is going on in a concrete case, and that kind of knowledge cannot be had from any sort of linguistic inventory. The adequate use of pieces of language, and the appropriate response to it, requires a situational understanding and a judgmental power that transcends what can be derived from the meaning immanent in the sentence alone. This is one of the reasons why Wittgenstein urges us to investigate the use of language. That will lead us to the discovery of the necessary interplay between the sentence form and the character of the situation in which it is applied.

One of the most striking features of Wittgenstein's later philosophy is perhaps his turning away from dealing with rules and their logical form to investigating what it means to follow rules. In this way the application of the rule and the very nature of the situation of the user become the focus of his philosophical interest. This is sometimes called "the pragmatic turn". Since one and the same rule can be followed in different ways, the correspondence rules of the logical positivists cannot do what was asked of them: constitute the meaning of the empirical concepts and thus mediate between language and reality. What guarantees that a rule is followed in the same way time after time cannot itself be a rule at all. It must in the end depend upon our actions and different kinds of spontaneous reactions involving what Wittgenstein once called *intransitive* understanding.⁵

⁵ The expression "intransitive understanding" is used in *Philosophical Grammar* (PG), p. 79, where Wittgenstein tries to make up his mind about how to characterize the understanding of a picture. He gives us the following options: "If I say "I understand this picture" the question arises: do I mean "I understand
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This is the deeper significance of his remark that rule-following is a *practice*.⁶ This concept is one of the key concepts in his later philosophy. We meet here most of the themes that dominated his thinking during this period. It is therefore not unreasonable to consider his later philosophy as a kind of practice philosophy, if by this term we mean all philosophy that operates from the insight that there exists a complicated network of mutually constitutive relations between concept formation, human reactions and activities, and what we call our reality. To learn to master a natural language is, in this perspective, not to learn how to formulate well-formed sentences on the basis of syntactical rules and with the help of language signs, which are tied via correspondence rules (semantic rules) to a certain segment of reality. It is, instead, to learn to master an enormously large repertoire of situations where use of language is included in an exceedingly varied, but non-eliminable way. In other words, it is a matter of mastering human reality in all its complexity. It is a matter

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it *like that*? With the "like that" standing for a translation of what I understand into a different expression? Or is it a sort of intransitive understanding?" If the latter is the case, "then what is understood is as it were autonomous, and the understanding of it is comparable to the understanding of a melody". He gives us to understand that he goes for the second alternative. Thus we see that understanding a picture or a melody has an intransitive character in the indicated sense. This also applies to the understanding of poetry where we are said to understand "something that is expressed only by these words in these positions", *Philosophical Investigations* (PI) I, § 531. In this context it is once more a question of having an alternative expression for what is understood or not: "We speak of understanding a sentence in the sense in which it can be replaced by another which says the same; but also in the sense in which it cannot be replaced by any other. (Any more than one musical theme can be replaced by other.)" *ibid.*

⁶ The concept of practice is introduced in the middle of his discussion of rule following in PI, § 202, to emphasize its most fundamental aspect. It articulates the observation that there exists a way of understanding a rule that is not an interpretation, an understanding that is expressed in ways of acting. Its character as intransitive understanding is fairly clearly indicated in OC, § 139, where Wittgenstein says that "the practice has to speak for itself". I return to this question and elaborate upon it below.

of learning to adopt an attitude towards it in established ways, reflecting over it, investigating it, gaining a foothold in it, and becoming familiar with it. This is accomplished mainly because we are born into it, grow up in it, and eventually are trained in the practices of linguistic involvement.

This, then, is the background for maintaining that there exists an internal relationship between concept formation, forms of human reactions and activities, and the reality which emerges as our reality by virtue of the concepts we have formed on this basis about it.

But now we might feel tempted to ask: "What is the importance of Wittgenstein's conception of practice?" To give an adequate answer to this question would take a book. I have elsewhere tried to indicate the main lines of such an answer. In this context it should suffice to mention a selection of the most prominent features relevant to the case at hand. One of the things he achieves by emphasizing the concept of practice is drawing attention precisely to the factors that are constitutive of meaning in situations involving the use of language in a non-eliminable way. One of the more surprising things that surfaces in this perspective is that the very exercise of an activity might be a constitutive part of the formation of concepts. The content of a concept can thus be regarded as a function of the established use of its expression.⁷ The exercise of a given practice is conse-

⁷ There is some need for caution in the way of expressing this point, since the traditional understanding of rules and concepts takes it for granted that the rules or the concepts can be articulated in their entirety. When, in the previous text, I have put rule and formulatable conceptual content more or less on an equal basis, this has been a concession to the tradition in the name of convenience. At this point in my presentation it is therefore incumbent on me to call attention to the fact that for Wittgenstein there is also such a thing as a rule that can only be partially articulated. Accordingly we can talk about rules and thus about rule-following activities also when it is a matter of being incapable of articulating the rule itself completely by verbal means, and not only when it concerns the very performing of the practice in question. Consequently we shall have to distinguish between that type of intransitive understanding which in general is attached to the application of concepts and the one that is
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quently to be taken as a necessary element as regards the expression of a concept. To document that one does in fact master a given concept one has to be accepted as a competent performer of the series of established activities or practices which incorporates the concept. The practice can thus be said to represent the application of the concept. This yields the following principle of conceptual mastery:

The grasp a given concept gives us on the world is expressed adequately only in practice.

It is our application or practice which shows how we understand something. That is probably what Wittgenstein has in mind when in his lapidary style maintains that "practices give words their meaning".⁸

But the concern for the *use* of rules or the rule-following *behaviour* has also other sources. Kant had a long time ago suggested that concepts in fact were best understood as rules. The general form of this conception of concepts was hypothetical in character:

If X has the properties $P_1, P_2, P_3, \dots, P_n$, then X is an O.

Husserl improved upon this conception by pointing out that concepts should be understood as *hierarchies* of rules, i. e. rules that contain other rules under them.

The first and most important thing about Wittgenstein's analysis of rule-following is to get an inkling of the very basic level at which it is conducted. It is the level where no demonstrations are possible,

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a function of the logical character of the rule or concept itself. There exists a kind of family resemblance between these two types of intransitive understanding, but they have different sources and are thus different in kind.

⁸ This remark is to be found in a manuscript that has been published in two different books, *On Certainty* and, *Remarks on Colour*. In the published material it turns up as § 317 in the latter.

where no definitions can be given, where the possibility of giving reasons no longer exists. It is the level where you might be able to get some glimpses of the limits of the intelligibility of the human language. Wittgenstein at one place describes it as the level where one is in a position to grasp what he calls "the limits of the empirical". And he also indicates that these limits consist in "ways of comparing and ways of acting".⁹ Operating at this level Wittgenstein cannot possibly make any use of theories. That explains why he keeps insisting that philosophy is an activity contributing to the clarification of the logical grammar of our concepts. This clarifying task is, it should be insisted, not wholly therapeutical in character. The repeated application of his language-game analysis, which essentially consists in making various comparisons and rearrangements, is aimed at producing an insight into the nature of language:

(W)e too ... are trying to understand the essence of language its functions, its structure. (And this essence is found in) something that lies open to view and that becomes surveyable by a rearrangement.¹⁰

This is why he says that "philosophy simply puts everything before us, and neither explains nor deduces anything. Since everything lies open to view there is nothing to explain".¹¹ This is not only a remark about Wittgenstein's conception of philosophy, it is just as much a remark about the level on which he thinks that a proper philosophical investigation should be conducted. It is the level

⁹ RFM, VII, § 22.

¹⁰ PI, § 92.

¹¹ Ibid., § 126.

"before all new discoveries and inventions" are made.¹² Philosophy simply makes us aware of things that are already there. One of the means for doing that is by rearranging "what we have always known".¹³ This element of rearrangement is absolutely basic to Wittgenstein's conception of philosophy. That explains why the order of his remarks carries such weight with him. Each one of them should be seen in connection with a selected group of other remarks. Otherwise none of them will be understood in the right way. This is, of course, an indirect way of communicating the kind of understanding that Wittgenstein wanted to produce in his readers. But to him it was the only way that was open to philosophy as he conceived of it. This, by the way, also goes some way to explain why Wittgenstein was struck by what he called "the queer resemblance between a philosophical investigation and an aesthetic one".¹⁴ He once remarked that "Philosophie dürfte man eigentlich nur dichten" – (Philosophy ought really to be written only as a poetic composition.)¹⁵ And this is all connected with the very basic level on which philosophy operates, according to Wittgenstein.

After thus situating the rule concept in the context of Wittgenstein's later philosophy, let me then return to his analysis of rule-following as it is here we meet with what was earlier called "*intransitive* understanding" – and probably with some kind of knowledge that are not translatable into verbally articulate rules – an aspect of our grasp of the world that has become known as *tacit* knowledge. We should by now be in a better position to understand what he is after when he says such a seemingly outrageous thing as that there is no

¹² Ibid., § 126.

¹³ Ibid., §§ 92 and 109.

¹⁴ C&V, p. 25.

¹⁵ Ibid., p. 24.

choice when we obey a rule: "I obey the rule *blindly*"¹⁶ is Wittgenstein's way of putting it. It is a remark that has to do with the possibility of determining sense or fundamentally making sense, if that expression is more to your taste. In this respect rule-following plays the same role in his later philosophy as did the idea of atomic propositions in *Tractatus*.

This much is clear from some of the things he says about the opposition between interpreting the expression of a rule and the plain rule-following. Thus there is far more to rule-following than the rule that is followed. The rule itself is in fact the least important element in the analysis that Wittgenstein made of the phenomenon of rule-following. It is the very *act* of following it and *how to establish its identity* that occupies the centre of his interest. And the reason for this should by now be clear. To go on to apply a word or react to a signpost in certain determinate ways are considered to be conditions for the possibility of making sense, to express the point in a Kantian way. Looking at the rules themselves does not get us anywhere in these fundamental matters. What stands fast for us, as he puts it in his last work, *On Certainty*, does not do so in virtue of some intrinsic and self-evident quality, "it is rather held fast by what lies around it".¹⁷ Essentially the same point is also expressed in *Remarks on the Foundations of Mathematics* (revised edition, 1978) where he says that "(w)hat, in a complicated surrounding, we call "following a rule" we should certainly not call that if it stood in isolation".¹⁸

What is at stake then in his analysis of rule-following behaviour and rule-governed activities is the bit-by-bit uncovering of those aspects of our mastery of language that are conditions for the possibility of communicating simpliciter. This is more or less clearly stated in the

¹⁶ PI, § 219.

¹⁷ OC, § 144.

¹⁸ RFM, VI, § 33.

last paragraph in his analysis of rule-following in *Philosophical Investigations*. It goes like this:

If language is to be a means of communication there must be agreement not only in definitions but also (queer as this may sound) in judgments.¹⁹

But here one should not be tempted to try to specify what kind of judgment he is talking about. For it is not an agreement in any specifiable type of judgment or opinion, it is said to be an agreement in form of life.²⁰ It is in other words not a question of relating to any propositional content expressed by the judgments, but rather a means of making us realize how fundamental are our ways of acting and reacting when it comes to establishing a system of meaningful signs in human communication.

This must suffice as an indication of the light in which Wittgenstein's remarks on rule-following behaviour should be seen. Let us then take a closer look at what goes on in the relevant passages in *Philosophical Investigations* and elsewhere where the question of rule-following is on the agenda. There exists a manifold of human activities that appropriately could be described as rule-following activities: applying a concept to situations that are different from those in which the concept was first acquired, developing a series of number on the basis of its principle, acting according to a moral norm in a particular case, playing a game in conformity with the rules that hold good for it, following a definition of a given word, subscribing to the laws that apply to making up one's will, etc., etc. In cases like these we are tempted to think that it is our *understanding* of the rule involved that makes us act or react in the proper way on future occasions of following the rule. But if the sup-

¹⁹ PI, § 242.

²⁰ Ibid., § 241.

posed rule is formulated verbally we immediately realize that its verbal expression can be interpreted in different ways. Thus the rule cannot itself guarantee that it is followed in the intended or established or correct way. And neither can a new rule be formulated in order to determine how the first one is to be followed since exactly the same kind of problems will arise in connection with it as with the first one.

We have already touched upon the fact that Wittgenstein in *Philosophical Investigations* terms following a rule a *practice*.²¹ If we ask what is achieved by this way of looking at rule-following, we get a fresh approach to our basic question. The concept of practice is namely called upon to resolve the paradox that Wittgenstein develops when investigating what is involved in saying that we do act according to rules. He outlines the conceptual conflict in this way: "No course of action could be determined by a rule, because every course of action can be made out to accord with the rule".²² This seems to be completely detrimental to our most deeply ingrained intuitions in these matters. His next remark, though, complicates things still more. He proceeds by pointing out that "if everything can be made out to accord with a rule, it can also be made to conflict with it. And so there would be neither accord nor conflict here".²³ This shows the full extent of the predicament we find ourselves in if acting according to rules is thought to involve an understanding of the rules that has the character of interpretation. In a concrete situation the following might be the case: Whatever we do is, on one interpretation, in accord with the rule, and on another interpretation it is in conflict with the very same rule. Such an

²¹ *Ibid.*, § 202.

²² *Ibid.*, § 201.

²³ *Ibid.*, § 201.

outcome is, of course, intolerable. Wittgenstein's way out of the quandary is to insist that

there is a way of grasping a rule which is not an interpretation; but which is exhibited in what we call "obeying a rule" and "going against it" in actual cases.²⁴

Hence we must resist the temptation to think that every kind of action according to rules is a matter of interpretative understanding of the rules since this creates an logically impossible situation. The alternative is a kind of understanding that is expressed in acting in concrete cases. That is why Wittgenstein in the following paragraph concludes that "hence also "following a rule" is a *practice*". This is the end of a series of logico-grammatical remarks concerning rule-following behaviour that is aimed at showing at least three interdependent and far-reaching conclusions about how language and world are related. The first one has to do with the rejection of the name-object model for mental predicates, exemplified here by the term "understanding". It is not the case that there need to be an internal and mental object of a sort that is always present when we correctly say that somebody understands something. The model requires this since the mental object is supposed to be or guarantee the meaning of the term "understanding". The second conclusion has to do with the rejection of the idea that only the presence of an interpretation of the rule can explain why we normally go on acting or applying the term in question in the intended way in the future. We both can and do manage quite well without such an interpretation. That means, on the other hand, that we have to accept another kind of understanding that is primarily expressed in acting the grasping of a rule that is exhibited in following it in the customary way. This turns out to be the kind of understanding we have already met with

²⁴ Ibid., § 201.

under the name "intransitive understanding".²⁵ This is a most appropriate expression that catches the very kernel of the point being discussed here. The third conclusion has to do with the rejection of the idea that interpretation should be considered a basic category in the explication of how a system of communication is possible. It is in this context that the concept of practice has an important task to perform. Interpretation and practice are in fact by Wittgenstein made out to be opposites. Interpretation is to him something that involves conscious intellectual activity. To interpret is to form an hypothesis. But such a hypothesis or interpretation can in no way be said to determine meaning, as we already have had occasion to see. To assume that "every action according to a rule is an interpretation"²⁶ creates a conceptually impossible situation. At some point, though, it must be possible to indicate what in fact does determine meaning, otherwise we are caught in a circle with no escape a really vicious one. This is exactly what the concept of practice is supposed to accomplish. In one place Wittgenstein simply notes that "(p)ractice gives words their meaning".²⁷ In what is in fact the very same manuscript, but published as a different book, he states that "(r)ules leave loop-holes open, and the practice has to speak for itself".²⁸ This remark has a peculiar aphoristic character and it is more than reminiscent of the aphorism that Wittgenstein used in *Tractatus* to convey the inexpressibility of logic. It goes like this: "Logic must take care of itself".²⁹

²⁵ See note 5.

²⁶ PI, § 201.

²⁷ ROC, § 317.

²⁸ OC, § 139.

²⁹ T, 5.473.

The point of the indicated opposition between interpretation and practice should by now be fairly clear. Wittgenstein is reaching for some means to make his reader realize that there is more to knowing the meaning of a word than abstractly knowing the rules according to which the word is used. And this additional element is brought out with the help of the concept of practice. For this non-interpretative way of grasping a rule is thought of as a kind of rock bottom that is, in different ways, involved in all determination of sense, or concept formation if you prefer that way of putting the point. An interesting consequence of this is that if anything is rightly to be talked about as a rule, it must of necessity be related to an established way of following it. And that means that rules actually get their identity from the very practices in which they are embedded.³⁰ The question of the identity of a given rule has, however, more to it than its being "inscribed" in a particular practice. Earlier I quoted Wittgenstein's remark to the effect that only in complicated surroundings could we sensibly talk about "following a rule". Understanding a rule cannot thus be an isolated or chance happening. It must of necessity be related to an integrated whole making up a human language. This is indicated by Wittgenstein when he is commenting upon what goes into understanding a given sentence: "To understand a sentence means to understand a language".³¹ A more hesitant way of expressing essentially the same point can be found in *Philosophical Grammar*: "The understanding of language seems like a background against which a particular sentence acquires meaning".³² The same holds, *mutatis mutandis*, for practices since the

³⁰ The question of the identity of rules I have treated more fully in my article, "Rule Following and Tacit Knowledge", *AI & Society. The Journal of Human and Machine Intelligence*, Volume 2, No. 3 (1988).

³¹ PI, § 199.

³² PG, p. 50.

manifold of practices has been shown to be the very anchoring point for human language. And "(l)anguage, I should like to say, relates to a way of living".³³ Only by having a sufficient mastery of the manifold of practices making up a language can one be said to understand the particular rules that could be abstracted from them. This understanding is furthermore not primarily of an intellectual kind. The grasp that the mastery of a particular concept gives us of something can only adequately be expressed by being practised. It is our application or practice that shows how we understand something. From this it follows that rules or concepts can never be fully understood except by those who successfully master the manifold of practices making up a human language. This does not preclude the possibility of constructing elaborate theories or models showing how the human mind and the human language works. But it is a sort of reminder that such theories of necessity are forced to leave out that very aspect of human languages that lies at the bottom of all sense-making – that it is *practice* that gives extractable rules direction, point, unitary application and identity as "these" or "those" particular rules. This aspect of our mastery of a natural language essentially escapes being articulated in the form of verbal rules or propositions. It is instead a necessary conditions for the application of any kind of rule as a rule. Accordingly the computer sciences shall never be able to reach their most ambitious aim of simulating human intelligence *in toto*.

³³ RFM, VI, § 34.