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The Elementary Forms of Pragmatism:
On Different Types of Abduction

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In the course of the once legendary Dubrovnik-seminars in the philosophy of social science more than two decades ago, Richard Rorty showed open dismay with many of his European colleagues. Once they took up an interest in pragmatism, he said, they turned to the philosophy of Charles S. Peirce and not to John Dewey or to William James. Rorty’s dissatisfaction stemmed from the view that Peirce’s version of pragmatism was the most removed from real pragmatic concerns of daily life and of politics. Contrary to Rorty, however, I believe that Peirce’s philosophy is both practical and political. The aim of this paper is to show its usefulness regarding both the construction of detective stories and scientific discoveries.

Before presenting some recent European reception of Peirce’s pragmatism, I will need to briefly sketch why the founder of American pragmatism, Charles Sanders Peirce (1839-1914) insisted on the idea that pragmatism in his view was “nothing else than the question of the logic of abduction”. (CP 5.196). Because of his concern with the logic of abduction, Peirce insisted on the need to distinguish between his version of pragmatism and other versions. He called his own version “pragmaticism”, as it was such an ugly term so that it would go safe from kidnappers. (CP 5.414).¹

Pragmatism and Abduction

In 1903, when living a miserable and desolated life, an old-time friend, William James, invited Charles S. Peirce, to Harvard University to deliver a series of lectures on pragmatism (CP 5.14-212). Peirce started this series of lectures as follows:

I suppose I may take it for granted that you all know what pragmatism is. I have met with a number of definitions of it lately, against none of which I am much disposed to raise any violent protest. Yet to say exactly what pragmatism is describes pretty well what you and I have to puzzle out together.

Pragmatism is the principle that every theoretical judgment expressible in a sentence in the indicative mood is a confused form of thought whose only meaning, if it has any, lies in its tendency to enforce a corresponding practical maxim expressible as a conditional sentence having its apodosis in the imperative mood. (CP 5.16-18).

William James described these Harvard-lectures as “flashes of brilliant insight relieved against Cimmerian darkness.” ([CP 5.1, note]). But the definition contains the flare of Peirce’s matured thoughts on pragmatism. His version of pragmatism, he now said, was a consequence of logic. It had little to do with more vulgar pragmatist thought advocating that only such thought that had useful consequences was to be considered “true”. Logic, in his view, was an exercise in self-control ([CP 5.130]), and hence, pragmatism was to foster such control. When we move on the level of restricted (formal) thinking, it is not that hard to accept a link between logic and self-control; either we are skilled in the art of drawing logical implications from given premises or we are not. The link between logic (knowledge) and self-control (ethics) is much more problematic in the case of the non-formal (synthetic) inferences of induction and abduction. We tend to regard these latter form of inferences as given by nature rather than by will.

Inductive inferences are based on the frequency by which events occur in a sample and can be assessed by probability logic. At the outset and to a modern reader, it seems unreasonable to fuse probability equations with the exercise of self-control! It is a statistical fact that cigarette-smoking “causes” cancer with certain frequencies, and to wish such statements away via an exercise of will seems foolish indeed. However, it was not induction that was in Peirce’s primary focus, as induction is formed on the basis of events occurring in the external world. In focus rather was the inference he called abduction. This inference is at the same time more primitive and more advanced than induction, as it helps in giving meaning in the perception of a special case: “My (deceased) brother was also a smoker”. The ‘imperative’ following such an observation goes: Do not smoke! Although there might be a strong probability that my brother died from too heavy smoking, I cannot rule out a complex of other causal factors operating in this particular case. We should be cautious when forming causal statements as to ‘what is’, and even more so when formulating imperative statements of how to behave. In the history of philosophy, the ‘naturalistic fallacy’ is a strongly felt imperative.

That we are prohibited from deducing individual conclusions from statistical frequency-distributions is well-known and even trivial. Nevertheless, we seem to do so over and over again, not only in (social) science, but even more so in daily life. We are often utterly sure of ourselves when we ‘see’ things, especially so when we are part of a culture of seeing, and when there is no one around to challenge our percepts and beliefs.

The recurring fascination and interest in the logic of abduction resides in the fact that it deals with ‘primitive classification’: why we see events the way we do. As also Emile Durkheim, Peirce claimed that there were social factors operating in perceptual processes. Contrary to Durkheim (and to Kant), Peirce did not conceive of such social factors as operating blindly behind our backs, but as potentialities of a future state of ‘scientific citizens’ (Elam & Bertilsson, 2003). Peirce nourished a hope that logic and science could teach men and women to see ‘particulars’ from the point of view of a universal community of observers. To us moderns, such a majestic hope may seem utterly futile, if not even downright dangerous (Latour, 1993). But we need be reminded of the contra-factuality of Peirce’s philosophy. It is not about being as such, but about the conditional processes thought to operate if seeing were to be endowed with something we could call reason. His whole project aimed at infusing self-control in the cognitive process epitomised in the act of seeing: “To act intelligently and to see intelligently become at bottom one.” ([CP 7.562]).
**Semiotic pragmatism**
In order to carry out the operation of connecting seeing and human (purposeful) action, Peirce elaborated on his *semiosis*: how signs operate in accordance with a triadic structure.

- Icon (vague experience)
- Index (observing)
- Symbol or interpretant (drawing inferences)

*Icon*, relating to immediate and spontaneous perception, is *firstness*. It stands for sensation, often barely conceived in consciousness, as we often experience *firstness* vaguely and diffusely; something bothers us, but we do not know what it is. We may feel irritation or perhaps joy, but we do not know as of yet how to conceptualise such diffuse feelings. In the firstness of experience lies also Peirce’s special version of phenomenology. Our organism is aroused and we feel an urge to find out what is going on. (*CP 5. 374*). This stage of vague experience relates to Peirce’s insistence that thought (logic, knowledge) also must be sensational: it must arouse our emotions.

*Index* relates to *secondness*: to brute facts. Observing ‘this bicycle as red’ stands for an insistence that what I see ‘as red’ corresponds to something out there. The vagueness of an *icon*, a first experience, has now achieved definite firmness; it has found an object to which it can relate. The horizon of contingencies is no longer indefinitely open; a process of selection has set in and closed the possibilities contained in firstness; this is ‘it’, and it can be no other. Indices stand for brute connections: seeing something ‘as’; experiencing something ‘as’. The secondness of index relates to Peirce’s insistence that thought (logic, knowledge) is about something; it is ‘factual’.

*Symbol*, or *interpretant*, relates to ‘sign-use’ (*semiosis*): how signs mediate and connect with other signs, and help us interpret that what we see. ² There is no individual interpreter (a subject) to be found in Peirce’s philosophy for “[I] t is that the word or sign which man uses is the man itself “. (*CP 5.314*).

It is hard for man to understand this, because he persists in identifying himself with his will, his power over the animal organism, with brute force. Now the organism is only an instrument of thought. But the identity of a man consists in the *consistency* of what he does and thinks. (*CP 5.315*).

The individual man, since his separate existence is manifested only by ignorance and error, so far as he is anything apart from his fellows, and from what he and they are to, is only a negation. This is man,

“…proud man,
Most ignorant of what he’s most assured,
His glassy essence.” (*CP 5.317*).

Symbol (or interpretant) relates to Peirce’s insistence on *thirdness*, that between a vague experience and an observation, firstness and secondness, there is a necessary third: an interpretive process where

² Peirce made the ‘linguistic turn’ well in advance of both Wittgenstein and the post-modernists (Apel 1973).
signs are set in motion. Hence, mediated by thirdness, experience goes beyond the individual and the particular. The operations of symbols create the sociality immanent in language-use. Signs enable a community of interpretation to develop and to extend in time and space. Because of such communities of interpretation, it is possible for individuals to `see´ things in common and to have shared (sensate) experiences.

The future-orientation is central to pragmatism, and especially in Peirce´s insistence to infuse the act of seeing with a will and a purpose. That which we are most sure of today will eventually be seen and experienced as strange in a distant future. To see the bicycle as read is at the same time an insistence that any other actor will see the same as I do, in case he or she cares to look! If an actor is not willing to bet on such a future promise uniting the perceptions of a great many other actors ´in an indefinite future´, the actor should refrain from making statements as to the here and now. Any statement as to the character of the world here and now also contains a promise as to the future: it is not just ´my´ world, but it is about a world shared in common indefinitely. As long as there is any trace of mankind left in the universe, the interpretive processes will continue to operate.

In the pragmatist philosophy of Peirce, truth resides in the belief of a common interpretation, extended in time and in space. So conceived, the imaginary reality of a future belief will most probably appear to us vague, diffuse – and perhaps a little sublime. The presupposition of there being a common sign-symbol, however latent, as a last result of the interpretive processes is for Peirce a necessary, and transcendent, claim. The claim is ´contra-factual´ in the sense that a shared reality will never reveal itself in actuality. That would be to reduce the universe to merely secondness. The universe is always much more than will ever be experienced by humans. The belief in a common interpretation is a necessary Third, without which thought would be empty and meaningless and without direction. If thought-signs are to have impact upon action, i.e. are to move us at all, they also carry a promise; that the pursuit of one course of action probably is better than that of another. It is better in the sense that it leads to warranted results not just for an individual actor but also for a collectivity of actors pursuing the same action course.

On logic in use: pragmatist consequences
According to classical definitions of pragmatism, such philosophy teaches us to think of the practical consequences that will follow the acceptance of a belief. Confusion exists however as to how we are to think of ´practical consequences´. Are we to think of such consequences in terms of experiences of happiness of the many, as is advocated by utilitarian thought? Or are we to think of such consequences in terms of the power of practical action in subjugating nature? Consequences so conceived are related to ´instrumental action´, and pragmatism, accordingly, is often accused of vulgar instrumentalism.

Peirce advanced a third and more theoretical type of consequences: to relate a series of statements in an endless process. A hypothesis is more powerful the more consequences it generates, particularly fresh ones. Such (theoretical) consequences are usually the way we think of a ´fruitful´ science. This is also what we mean by ´conjectural´ science, proposed by both Karl Popper (1962) and Carlo Ginzburg (1983). Conjectural science has consequences for a great deal of other facts. Conjectural science focus on ´connectedness´, or that which Peirce (and Popper) called thirdness. It refers to a process of interpretation extended in time and in space.

Logical or semiotic pragmatism is thus nothing else but a focus on how signs are related, and how they
combine in generating ever new combinations. Logical relations are of at least three types, and hence intimately related to Peirce’s triadic semiosis (icon, index, symbol):

- Deduction (symbol)
- Induction (index)
- Abduction (icon)

Deductions and inductions are well-known operations used by any one of us, whether we are laypersons or logicians/scientists. Deductions enable us to draw logically correct inferences from a major and minor premise:

- All men are mortal
- Socrates is a man
- Socrates is mortal

Deductive operations are powerful in the sense that they help in navigating (if x, then y). Although formally correct, deductive inferences may nevertheless be empirically false. If either the major or the minor premises, or both, are empirically false, so are the results (consequents). Therefore deductions need to operate in close contact with the two ‘empirical’ inferences: induction and abduction. This is also how Peirce sees the operation of modern science: a fusion of logical and empirical sign-operators.

Induction is a powerful inference triggered as it is by the habits of experience. We expect swans to be white for the reason that this is how we have usually seen them. When operating in isolation from the two other modes of inferences, Peirce was well ahead of Popper in criticising the empiricist fallacy of induction. In responding to those critics of pragmatism who accused this philosophy to focus solely on the importance of practical operation in revealing reality, Peirce wrote:

But it may be objected, “Why make so much of these remote considerations, especially when it is our principle that only practical distinctions have a meaning?” Well, I must confess that it makes very little difference whether we say that a stone on the bottom of the ocean, in complete darkness, is brilliant or not – that is to say, that it probably makes no difference, remembering always that that stone may be fished up tomorrow. (CP 5.409).

The power of induction lies in its ability to form probability statements: all other conditions equal, the higher the frequency of an occurrence in the past, the higher is the probability that it will occur also in the future. Behavioural habits, of the mind or of the body, inform the organism where to seek or to look. It is highly possible that mankind share the power of inductive thinking with animals as revealed in Pavlov’s experiments. Once a habit is acquired, the organism can economize with its energy: it can take certain things for granted in order to spend more energy on those things that are not yet in order. The conditioned reflex in Pavlov’s experiment is for that matter nothing else than the forming of a new habit: the dog knows where to look for food the next time.

Peirce’s triadic scheme demands the consideration of yet another mode of inference: abduction. Abduction is not wholly new in the history of philosophy: already Aristotle had contemplated a form of statement called apagoge (CP 1. 65; 68). As the smooth operation of both deduction and induction in
fact hangs on the ‘substance’ nourished by abduction, abduction becomes the key inference. It informs us as to ‘why something is the way it is’. Often the “abductive judgment comes to us like a flash. It is an act of insight, although of extremely fallible insight.” (CP 5.181). Peirce’s own well-known example is about the beans:

Minor premise: These beans are white.
Major premise: The beans in the bag are white.
Result: The beans come from this bag.

However trivial as this ‘semi-logical’ operation may seem, it nevertheless has wide consequences. What kind of inference are we really dealing with? It does not have the same logical firmness as deduction, where the result must be true if the major and minor premises are true. The act of insight that “the beans are from this bag” may not be true at all, as someone else outside our purview might have put them there. Nevertheless an abductive inference strikes us often as a reasonable (working) hypothesis. An abductive inference gives us a clue to reality, but it always remains on the level of a may-be. And if we look seriously into the premises which guide both deduction and induction, we will soon see that abduction plays a crucial role in each: it informs the minor premise in deduction (Socrates is a man) as it informs the rule of induction (swans are white). Abduction, Peirce says, is closest to reality for we cannot form any judgment at all if it were not for the power of abduction; we now see what we did not see before.

The only mode of inference that can truly give rise to surprises is that of abduction. Deduction does not really ‘see’ anything at all as it serves a control office. Induction does not see anything new either for its main purpose is that of helping us to form habits of expectations. Both these operations are absolutely essential for human living. We probably share these inferential modes with other mammals, although they are refined and explicated as logical thought-operations in the case of humans. However, the case of abduction may be different. The act of seeing something anew, to connect a case with an unexpected rule, demands mental faculties of some considerable degree. It might be that a blind evolutionary process (of natural selection) provides other mammals with similar abilities. New outer circumstances demand that any living creature can change and accommodate their behavioural patterns accordingly. In the case of mankind, the power of our brains has furnished us with the capacity to make connections, and to navigate in wholly new symbolic environments. Our uniqueness as species resides in the fact that we can free ourselves from external restraints. In and through thought, we can (re)model our symbolic environment. Hence, in comparison with other mammals, as species we have a unique degree of freedom visa vi external conditions.

Abduction in Peirce’s philosophy has many key leads: it serves both logic and biology. Neurobiology was not yet a field of science when Peirce was alive. But it might have been that field of investigation that would most intensively call on his attention.

As we have seen, Peirce’s pragmatism is to render seeing with a will, and to transform it into a purposeful social act. In fact, this is both the beginning and the end of scientific inquiry. In the beginning, vague perceptions form our visions of what is out there. It is the purpose of scientific investigations to critically transform our vague common sense into more precise statements (concepts). In the case of the construction of a good (detective) story, the same “logic” is at work.
Umberto Eco on Variations of Abductions

In *The Sign of the Three* (ed. 1983) with the subtitle ”Dupin, Holmes, Peirce”, Umberto Eco suggests that we can learn a lot on what is going on in scientific interpretation by looking more seriously into the chain of inferences typical of a good detective story. By no means does he equalise science and detective stories (as there are differences!), but it is nevertheless pedagogical to learn of the constituent features that shape a good detective story and help the act of discovery in science.

As already noted, Peirce’s discussion of abduction is indebted to that which Aristotle calls *apagoge* (Eco, 203, ref. to *Prior Analytics* II, 69a 20). Peirce holds the opinion (from Aristotle) that at the bottom of any cognition, there is a hypothesis. Hence, all knowledge, especially in science, is built on uncertainties as bottom rocks. Even in those sciences, which we accept as most certain, uncertainties and guesses abound. Take for instance the case of fossil remains of fish in the interior of the country. We conclude from these signs that the sea at one time “washed this land.” As Eco says, “a whole paleontological tradition seems to encourage such an abduction.” (Eco, 204). But we could also entertain, now alluding to detective stories, some very different kind of accounts such as this one: a party had picnicked here some time ago and left lots of trash! Or why not also entertain the possibility that Steven Spielberg willingly had placed some such fossil for the sake of shooting a movie.

According to Eco, there are distinctions in the abductive process not properly recognised by Peirce. A first difference is that between an abductive inference that explains a fact (the fossil) by ‘deducing’ it from a general law (the presence of water), and an inference that relates one kind of facts (fish bones) to other facts, as for instance, the picnic party. The first kind of inference is typical of science, whereas the second kind of (coded) inferences is typical of detective stories. Eco speaks of ‘universes’ in the first instance and of ‘texts’ in the second. But he proposes that we see the two accounts as similar, at least initially. Both accounts are textual in essence, as they ‘code’ events (Eco, 205). Scientific interpretations whether in medicine or in law are ‘conjectures’: the occurrence of one event (a sign) conjectures the (possible) presence of other events (signs).

Eco distinguishes between the following types of abduction:

- **Over-coded abduction** (hypothesis)
- **Undercoded abduction**
- **Creative abduction**
- **Meta-abduction**

*Over-coded abductions* are omni-present in daily life: not to pass a red light at a cross-passage, even if there are no cars around. These interpretations are often strongly culturally embedded. The more embedded we are in the culture, the more interpretations we can take for granted. These are the interpretative procedures that Harold Garfinkel’s laypersons perform continuously: the institutionalised performances, which are necessary for rapid social intercourse (1967). Pierre Bourdieu has suggested the notion of *doxa* for such common sense coding that occurs as a matter of fact. It seems plausible to
refer to these over-coded inferences as grounded in more or less pre-reflexive traditions. However, also in modern advanced societies such over-coded inferences abound. They facilitate human intercourse: in routine thinking, we need not ‘think’. The thicker the culture, and the more embedded we are as actors, the more are the over-coded responses ordering human intercourse.

*Under-coded abductions* occur in daily life as well, but such interpretative ‘achievements’ seem more typical for controlled modes of inquiry, such as science, law or detective stories. As the speaker/hearer has to make explicit new interpreting links, relations between events can no longer be mechanically inferred. Eco gives the classic example of Kepler’s discovery of the rotational form of the planet Mars. Why did it take the form of an ellipse rather than that of another form? An under-coded abduction is severely restricted by previous puzzles. Thus, there are clear differences here between good and bad abductions: we are not free to construct reality as it pleases. Such abductions that dissolve previous riddles, and present a way ahead are more robust for the time being than are others not performing so well. Scientific hypotheses, or theories, are typically instances of under-coded abductions. The point is that such inferences (or complex of inferences) are ‘on trial’. At present, they are the best, or the most economical, at hand in order solve puzzles.

At this point, it is worth repeating the significance of the transition from over-coded hypothesis to the under-coded types of abduction in Peirce’s own philosophy. As already mentioned, the first type he called percepts (vague interpretations, albeit they may take the form of cock-sure assertions) while he thought of the second type as more cautious abductions. These are inferences where the actors show precautions and humility, as they are aware that ‘things could be different’. To help facilitate the transition from *doxa* to humility was what Peirce’s pragmatism was about. It offered the operative agency of *critical common sense*. (On critical common sense, see below).

*Creative abduction* is a third type of abduction in Eco’s elaboration. Here are the great revolutionary scientific discoveries that change our worldview. The point is that a pattern, a law or a theory, has to be elaborated upon and invented *ex novo* (Eco, 207). This is most likely what Thomas Kuhn had in mind when elaborating upon paradigm changes. For Eco, creative abductions have a greater degree of freedom as to their constructions *visa vi* their subject-matter (what they are about) than the previous, and more restricted type of under-coded abductions. But a crucial point in Eco’s elaboration is that such creative and revolutionary types of abductive interferences as found in path-breaking scientific discoveries as a rule are dependent upon some other types of second-order interpretations, which he calls *meta-abductions*.

*Meta-abduction* occurs when we are confronted with a puzzle, whether in daily life or in science. There are observations that do not fit our expectations or conceptual apparatus, and require that we think ‘anew’. Such meta-abductions form the warp of all good detective stories. Has Mr Watson, in Conan Doyle’s novel, really been at the post-house? He had mud on his shoes that ‘indicated’ that he had walked down the street that leads to the post-house? But what would he do there? He needed no stamps! A wild hypothesis against all odds, Sherlock Holmes guess is that Watson sent a telegram… Nevertheless it is an elegant hypothesis that solves the mystery. Eco’s point is that such meta-abductions, conjecturing one series of happening in order to solve previous puzzles (mud on the shoes) are necessary for creative abductions to occur. Creative abductions can replace universes, as we now
see things wholly different from before. Nevertheless, Eco says, in science such path-breaking events occur as a consummation of a string of previous meta-abductions advancing certain second-order observations (Watson had sent a telegram). Or a reversed time-order is in operation. Creative abductions in science set in motion a series of meta-abductions of the kind: `was it that simple!´

In Eco´s view, the difference between scientific interpretation and mystery stories lies in the mode that the two conjectures employ creative abductions and meta-abductions respectively:

Probably the true difference between abductions from fact to laws and abduction from facts to facts, lies in the meta-abductonal flexibility, that is, in the courage of challenging without further tests the basic fallibilism that governs human knowledge. That is why in “real life” detectives commit more frequent (or more frequently visible) errors than scientists. Detectives are rewarded by society for their impudence in betting by meta-abduction, whereas scientists are socially rewarded for their patience in testing their abductions. (Eco, 220).

In mystery stories the text also creates the reality that it at the same time refers to: there is no difference between res extensa and res cogitans. Eco employs Voltaire’s essay on Zadig as an illustration of what happens to a man who is condemned by the Master of King’s Hounds and the Chief Eunuch “for having denied seeing what he had (undoubtedly) seen.” (Eco, 215). In the story later inspiring Woody Allen, Zadig presents a series of abductions that allow him to infer that a dog (“a bitch”) and a horse have passed by his house. Zadig has seen nothing of the sort, but because of his brilliant sense of connecting indices with interpretive pathways, he tells a story. The authorities believe in what he is telling them; it fits their expectations very well. When Zadig repents his admission, the authorities are infuriated and penalise him. But the story of Zadig is about a man who is uncertain as to the fit between words and things. When he reveals his uncertainty as to if he has really seen that which he just said he had seen, the world chastises him.

It is precisely the privilege of being able to recognise such an uncertainty (between words and things) that characterises scientists in Eco’s view. On the one hand, they live in a fallible universe, and, on the other hand, they are expected to stick to an interpretation unless it is shown in repeated tests to be false. Eco’s picturing of modern science seems in fact to fit the CUDOS-norms of Merton’s sociology of science better than the post-modernism of Bruno Latour and others. Endurance of a special sort seems in fact to be the differentiating specia of science in the view here presented. The enigma of the human condition is that we can never be certain that our beliefs correspond to a world “out there”. However, in the lack of visible evidence of a world wholly different, we have better stick to the one that we already know. 3

The important point that we learn from Eco is that interpretative devices operate on many different “epistemic” levels: from the unconscious over-coded ones that tradition bestows us with, to the more controlled and under-coded ones by which we juggle along in everyday life as in science, to the more spectacular interpretations by means of which a world view can be changed - or a mystery solved. The point is also to stress the interchange between all these levels. More refined forms of life, as the expert

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3 At this juncture Eco takes charge with the “evolutionism” of Charles S. Peirce: Peirce mysteriously believes in a lume naturale where scientific discoveries are seen as texts of world evolution! (Eco, 218; CP 6.604).
languages of science, law and literature, cultivate greater explicative controls. It is by that token alone that they can be called `expert cultures´.

In interpreting that what is, we have to rely on conjectural thinking, which both engages and alienates. Both Peirce and Eco are in this respect close to critical realism, but the question is if any of them can take real comfort in its more recent forms of articulation.

**Critical realism and abduction**

Recent currents in the methodology of the social sciences also focus on the centrality of abduction (as hypothesis) in scientific inquiry. (Bhaskar, 1989; Archer et al., 1998; Danemark et al., 2002; Sayers, 1992; 2000; Layder, 1998). Critical realism distances itself from the more popular interpretive or hermeneutic philosophies now in vogue in the social sciences. Of particular interest is the claim that sociology as a science of complexity has a special ontological and epistemic status in the tree of science. On the level of methodology, it cannot be reduced to any other science such as physics. Its special status also demands a special methodology to secure its scientificity. The scientific status of sociology is to be achieved not the least by the use of abduction. Indeed, abductive inferences are necessary when sociologists seek to link social structure and individual action. The link between (abstract) structure and (concrete) action, between external forces and individual will, has long presented sociology with its real challenge (Giddens, 1984). C. W. Mills ceased upon this challenge as the `sociological imagination´ (1959).

Critical realism of which there probably are several different versions makes one strong ontological claim. It views `social reality´ as a complex bundle with at least three (ontological) levels: experiences, facts, laws or so called generative mechanisms. The *first* level is subject-ridden: sensate experiences require the presence of an actor. Interpretive sociologists, symbolic interactionists and social constructivists, remain for the most on this ontological level. A *second* level is that of facts and relations between facts. It is typical for critical realists to postulate such an order outside the experiential level of subjects: there are myriads of facts in the world of which we have no experiential knowledge as of yet. 4

In the case of the social sciences, factual orders beyond the sensate experiences of individuals are captured by statistics as for instance the fertility rate in 18th century Britain or the World Bank prognostication of food supply in Africa. Such factual orders are the products of sophisticated measurements, and could not possibly be `sensed´ by isolated subjects. When observing the universe, it is clear that we employ complex inferential thinking (conjectures or configurations) allowing us to deal with complexity: huge numbers of data set in time and in space.

4 In this regard, the affinity with Peirce´s philosophy becomes obvious.

> “But I may be asked what I have to say to all the minute facts of history, forgotten never to be recovered, to the lost books of the ancients, to the buried secrets. Full many a gem of purest ray serene The dark, unfathomed caves of ocean bear; Full many a flower is born to blush unseen, And waste its sweetness on the desert air. Do these things not really exist because they are hopelessly beyond the reach of our knowledge?” (CP 5.409).
But a third ontological order is stipulated by critical realists, that of law or generative mechanisms. There are causal mechanisms of a subtle order ordering the (social) universe, but such mechanisms are not empirical in an old positivist sense. They have to be postulated or inferred by science. In the case of the social sciences, this is clearly the domain of theory. Theoretical thinking is explanatory in character as it strives for generating contra-factual statements as to what would happen, if certain conditions were to be present. Explanatory statements are not dealing merely with statistical relations between sets of facts in the world, but are attempts at isolating the causal mechanisms that produce recurrent patterns of events or relations between them. When observing climactic changes over time, we attempt to find underlying ‘causal mechanisms’ in operation, whether man-made or not.

The advantage with the three world-level ontology, found in critical realism and in Peirce’s pragmatism alike, lies in its offering social scientists with language tools for dealing with events and relations on several interrelated (world) levels. The following illustrations (Danemark, 88) will suffice in order to show how abduction is deeply embedded in sociological thought:

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<tr>
<th>Events/observations</th>
<th>Pattern/structures</th>
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<tbody>
<tr>
<td>Men and women communicate</td>
<td>Gender structures in operation</td>
</tr>
<tr>
<td>Pupils and teachers interacting</td>
<td>School as institution</td>
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<tr>
<td>A text with a content</td>
<td>Ideological content</td>
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<tr>
<td>EU-parliament in Brussels</td>
<td>A new power structure</td>
</tr>
<tr>
<td>A funeral, greeting, office-briefing</td>
<td>Rituals</td>
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In all these instances, the patterns and structures are inferred, as there is no way to ‘see’ these patterns in concrete events and occurrences. In the language of Eco, one could ask if these abductive inferences are over-coded or under-coded? From a layman’s point of view, the seeing of these structures are just assumed as the way it is; from the point of view of a sociologist, the ‘seeing’ of such structures operating in concrete events may require some more deliberations as it depends upon underlying theoretical assumptions.

As in the case of class or gender, the reality of structures need not be actualised in all empirical events in order for it to ‘exist’. The typical tragedy of the social sciences looking for structures (power, discourses etc.) is the ‘fallacy of misplaced concreteness’ (from A.N. Whitehead): we see the instantiations of structures in all occurrences without regard to whether such instantiations are actualised or not on the empirical level. The existence of a structure does not lie in its omni-presence in all occurring events, but rather in its recurrent operation of generative mechanisms under certain
conditions. Smoking is a generative mechanism in causing cancer, but this does not mean that all smokers suffer from the disease. To find the pattern of co-acting generative laws (or mechanisms) is the golden rule of all inquiry, whether in the social or the natural sciences. The search for such often latent patterns, or for generative mechanisms in governing social reality, demands the special abductive quality of finding links between events and non-events: under what conditions does smoking cause cancer? Abductive operations often assume the form of theories in the social sciences. The point here, stressed by the critical realists and certainly by myself, is the following: theory is not a phase of inquiry lying outside and beyond that of methodical inquiry, but an intrinsic methodological phase by which we learn to link the empirical with the logical, the contingent with the necessary. Abduction operates on all levels of inquiry, whether in the form of under-coded ones or as series of meta-abductions. The creative form of abduction is as rare in the social as in the natural sciences. Learning to cultivate abductive operations, on all levels, is the special earmark of a creative and self-reflexive science.

The centrality of abduction for sociology will perhaps be clarified further if we see this type of inference, and its specific mode of operation in conjunction with the other inferences. Exponents of critical realism are as much aware as was Peirce of the modalities of thought following the employment of different types of inferences. Induction is the practical mode of relating observations, and to construct empirical generalisations: all swans are white. Frequencies of observations teach us, in daily life as in the scientific laboratory, that we can expect with some probability that some events rather than others are likely to occur. However, as stressed already by Karl Popper (and by Peirce), critical science cannot rely on induction, but need to proceed on a logic of modus tollens: to seek for falsifying instances via the critical instance of deductive logic in order to refine theoretical statements.

In order to elaborate on what I suspect to be an important difference between critical realism and Peirce with regard to the mode abduction is employed in inquiry, I need however attend to an epistemic difference as to how Peirce and Popper employed it respectively. The reason for this excursion lies in my suspicion that critical realists in this respect are much closer to Popper than to Peirce: pragmatist philosophy of any sort is not really in their taste!

As a logic of justification rather than a logic of discovery, Popper’s logic of inquiry does not harbour real puzzling events: when data does not fit theoretical or empirical expectations; when deviations are no longer orchestrated by the investigator from above as falsifying instances, but show up from below as non-ordered events; as surprises and shocking events. In Popper’s theory of inquiry, such events demand the creation of new hypothesis, and the construction of such new inferences lies beyond the logical mind of the philosopher: it belongs to the creative psychology of genius minds. Hence, every year at the time of the Nobel Prize festivities, there are long interviews in Swedish mass media (now broadcasted even globally) with the laureates as to how they themselves see the mysteries of creative minds: can these properties be cultivated – or are such events to be seen as unique (and God-given) events in the universe!

In the case of the history of social science, this attitude of regarding the hypothesis – Verstehen – as a psychological rather than a logical entity is well-known (Bertilsson, 1996). In 1948, Theodore Abel wrote a seminal article “The Operation Called Verstehen”, in which he launched a full-scale attack upon the proponents of various Verstehen-approaches, notably on Florian Znaniecki’s notion of a human coefficient as a ground of validation in the social sciences (Abel, 1948:211-218). The distinction
between the empirical (irrational) and the logical (rational) was a key factor in more traditional versions of logical positivism, including the critical rationalism of Popper. Herein lied a crucial split and a fight as to the domain of rationality and reason between the two opposing methodologies in the case of the social sciences: the scientific and the more humanistic type of studies. Whether or not a new *Positivismus-Streit* is to develop at the present time as a result of the strong scientificity-claims of critical realism is difficult to know. But if it were to develop, the epistemic status of abduction may once more become a battlefield.

Peirce’s theory of inquiry necessitated the inference of abduction as a quasi-logical necessity for the smooth operations of induction and deduction (Habermas, 1968). The validity of abduction cannot be secured by formal logic alone. Hence, its quasi-status as a link of transmission between the empirical and the logical, between events and theory. It follows that this quasi-logical ‘episteme’ of abduction also becomes a matter of concern for critical realists. It is their view, that the non-reality of many social events demands a methodology that suits the special character of the social itself. Denying causal relations and explanatory logic altogether, the methodology is not to be supplied by hermeneutics or the logic of the cultural sciences. On the contrary, the methodology of the social sciences demands as much *scientificity* (explanatory logic) as does that of the natural sciences. However, given the complexity of the social world and its multi-levelled actualisation (as events, facts, and laws), the methodology of the social demands special theoretical efforts (meta-abductions!) in order to make sense of that self-some world of ours. Not having access to the laboratories of experimental science, explanatory inquiry in the social sciences proceeds as a series of (under-coded!) abductive inferences operating on many levels. Theory becomes a replacement for experiments, and in such a way it assumes an experimental character: it becomes contra-factual.

In critical realism, accordingly, a distinction between abduction and retrodiction is proposed (Danemark et.al., 2002: 80; 110). Referring to Aristotle’s *apagoge*, Peirce had mentioned these two forms of operations in a flung (*CP* 1, 65; 68). The preference for distinguishing between abduction and retrodiction in the case of modern critical realism seems to lie in the overwhelming interest to prove the actual reality of the third level: of laws, and of generative mechanisms. These laws or generative mechanisms are non-observable, and they must be (theoretically) inferred. If I understand critical realism correctly, abduction is but a first creative phase in the seeing of such patterns, while retrodiction is a further logical step in the control of necessary and contingent relations between events. In a recent critical realist textbook on methodology, the difference between abduction and retrodiction is marked as follows:

(Abduction): “To interpret and recontextualize individual phenomena within a conceptual framework or a set of ideas. To be able to understand something in a new way by observing and interpreting this something in a new conceptual framework.” (Danemark, 80)

(Retroduction): “From a description and analysis of concrete phenomena to reconstruct the basic conditions for these phenomena to be what they are. By way of thought operations and counterfactual thinking to argue towards transfactual conditions” (Danemark, 80)

Retrodiction is a thought-operation derived from *transcendental* philosophy. Roy Bhaskar (1978) also calls his philosophy “transcendental realism” in order to lay the ground for the transfactual realm: what
is needed for an object to be what it is. Contrary to Kant’s transcendental idealism in locating such *a priori*’s in the psychology (and anthropology) of the mind, critical realists such as Bhaskar have the ambition to locate these constraints as essential tasks of social theory. According to critical realism, a central aim of social theory is to search for “transfactual conditions”: “Scientifically significant generality does not lie on the face of the world, but in the hidden essence of things” (Bhaskar 1978: 227 cited in Danemark 2002:77). Critical realists differentiate sharply between empirical generalisations (surface events) and transfactual generalisations (relations between surface events and deep structures or “hidden essences”). The operation of retroduction is to enable transfactual generalization, i.e. to search for necessary, hidden essences. While retroduction is a logical-theoretical operation, abduction is preparatory and psychological. In this regard, critical realism seems to adhere to the classic distinction of Popper and logical positivism: we are presented with a logic of justification and not a logic of discovery.

I will abstain from entering into the more transcendental or transfactual logic of arguments inherent in critical realism. I will return to Peirce’s critical common sense (as a form of realism), and the promise inherent in the pragmatist form of abduction: to bridge logic and ethics, theory and action.

**Conclusion: Abduction and Critical Common Sense**

Peirce repeatedly insisted that his semiotic pragmatism was but specie of *critical common sense*, a philosophy of scholastic realism that he had learnt from the Scottish School (Thomas Reid and William Hamilton). Familiar with the scholastic strides between realism and nominalism, Peirce clearly sided with the former. Signs are not merely figments of our imaginations; they are real and partake in the constitution of the universe. To learn how to use signs ‘correctly’ is to partake in the evolutionary process. In my handbook of philosophy, critical common sense philosophy is defined as follows:

> The label ‘critical common sense’ might be used, not too misleadingly, to distinguish...those philosophical views which combine the greatest respect for common sense with the insistence or admission that at least some of its beliefs are open to critical revision. (The Encyclopaedia of Philosophy, I/II: 157).

The respect that Peirce had for common sense derived from his view that common sense was a reservoir of derived collective experiences of mankind. Although any one of its assumptions, taken separately and in isolation from the rest, may turn out to be false, they (society!) could not all together turn out to be false! In controlling common sense prejudices, the office of abduction was not wholly logical, nor was it speculative. The cradle of Reason was found here. During the course of his tragic life-course, Peirce himself waived several options to ground the validity of abduction. He contemplated both aesthetics and ethics as furnishing such grounds. As Eco correctly criticised him for, he even contemplated the possibility that scientific discoveries were the operative force of a special *lume naturale*: a link between the genius and the world. For a modern mind, it is difficult to accept such mystical forces operating in nature. Nevertheless, what we have learnt from Peirce’s pragmatism, as critical common sense, is to regard the long-term consequences for the community at large that may be the result of any particular scientific discovery. We have learnt that ‘seeing’ can become a communal process extended in time and in space, and that it can be endowed with reason. So considered, science
does not deal with a theoretical and cognitive universe totally separated from its long term practical and human consequences at large.
References


