

## Peirce's "method of tenacity" and the "method of science": the consistency of pragmatism and naturalism

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In 1877 Peirce distinguished between four different methods of "fixating our beliefs" (Peirce 1877), among which I will concentrate on what could be called the "method of tenacity" to be contrasted with the "method of science". The method of tenacity is described as an epistemic attitude that consists in reinforcing one's beliefs at all costs, however they are arrived at, while the method of science consists instead in letting one's beliefs be constantly shaped and revised by empirical, mind-independent regularities (laws) that are exemplified by natural phenomena. In this paper, I will claim that these two "methods" can coexist, despite their apparent conflict, so that pragmatism, relying on the method of tenacity, and naturalism, relying on the method of science, can and should coexist, both in science and in metaphysics. I hasten to add that in this paper I not interested in presenting a faithful reconstruction of Peirce's thought, but simply in using his distinctions as a pretext for some philosophical reflections.

The outline of the paper is as follows: in the first section (1), I will present and briefly discuss both Peirce's method of tenacity (which I take as *a* way to define pragmatism as I intend it here) and his method of science (which I consider as a way to define naturalism as intended here). In the second section (2), I will show why the apparent reasons for conflict between the two methods are really reasons for their complementarity, both within science and decision making; in (3) I will discuss a case study in metaphysics, in which "tenacity" proves important: the determinism/free will debate.

## 1 Peirce's method of tenacity and his method of science: what are they?

We can summarize Peirce's definition of what I here call "the method of tenacity" with the following words:

«If the settlement of opinion is the sole object of inquiry, and if belief is of the nature of a habit, why should we not attain the desired end, by taking as answer to a question any we may fancy, and constantly reiterating it to ourselves, dwelling on all which may conduce to that belief, and learning to turn with contempt and hatred from anything that might disturb it? ... I have often known this system to be deliberately adopted. Still oftener, the instinctive dislike of an undecided state of mind, exaggerated into a vague dread of doubt, makes men cling spasmodically to the views they already take. The man feels that, if he only holds to his belief without wavering, it will be entirely satisfactory. Nor can it be denied that a steady and immovable faith yields great peace of mind. » (Peirce 1877, v)

If we try analyze these words with some attention, we notice that there are *two* important assumptions for the applicability of the method of tenacity, and that the application of the method can itself be divided into two different stages. Let us first look at the two assumptions and then briefly comment on its two different stages.

The first assumption is that at least in some circumstances of our lives, reaching a state of certainty about a proposition  $p$  is preferable to being in a state of doubt about it. Doubting about  $p$  can be painful, so that it is plausible to suppose that our goal might simply be to overcome a state of doubt:

«Doubt is an uneasy and dissatisfied state from which we struggle to free ourselves and pass into the state of belief; while the latter is a calm and satisfactory state which we do not wish to avoid, or to change to a belief in anything else.» (Peirce, 1877, *ibid*).

Peirce here is claiming that, as a matter of psychological fact holding for all human beings, doubting that  $p$  can be much more painful than either believing  $p$  or disbelieving  $p$ . This is, I take it, the content of the first sentence of the first quotation above: "If the

settlement of opinion is the sole object of inquiry". In Peirce's terminology, "inquiry" is the very process by which we terminate a state of doubt.

But how can it be that settlement of opinion is the *sole* object of our inquiry, independently of the *truth* of the belief that has been achieved? Clearly, an additional presupposition of the inquiry in question is that either there is lack of evidence for or against *p*, so that truth is not to be attained, or that merely arriving to *think* that *p* is true (or false) is often *de facto* sufficient to decide to end the inquiry, say, because there is no more time to inquire, or searching is costly, *in particular if we need to act on the basis of a belief concerning p*. These cases are so well-known in decision theory that they don't deserve any further comment.

The second assumption is also controversial, as it might be taken to imply that believing is not just a guide to action but itself, at least in part, a consequence of a voluntary act ("if belief is of the nature of a habit", writes Peirce). It is very important to be clear about *two* different senses in which "belief as a habit" could be intended. In one sense, "habit" is simply the association of a certain behaviour to the relative belief. If I believe that "all dogs are dangerous" I will act accordingly, in virtue of an association of a fearful emotion to the sight of dogs.<sup>1</sup> In a second sense though, belief itself must be regarded as something that can be at least in part controlled by our will ("the will to believe", in James' sense).<sup>2</sup> This is clearly what Peirce had in mind, since he writes: «A man may go through life, systematically keeping out of view all that might cause a change in his opinions, and if he only succeeds ... I do not see what can be said against his doing so.»

An obvious objection to this second presupposition (and to the "will to believe" in general) is that we *can seldom* influence what we ought to believe voluntarily: in this second

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<sup>1</sup> Not by chance, Peirce mentions a reflex action to explain what the identification of beliefs and habits amounts to «... for the analogue of belief, in the nervous system, we must look to what are called nervous associations -- for example, to that habit of the nerves in consequence of which the smell of a peach will make the mouth water.» (ibid.)

<sup>2</sup> James (1897).

sense of “habit”, believing is *not* like a suit that we can choose to wear or not. While in many instances this point must be conceded (consider, e.g., *perceptual beliefs*), we should note that *behaving as if we believed in p* might tend to reinforce our belief in *p*. Again, this could be a psychological fact about our nature, coming into play whenever evidence for or against *p* is lacking, or is not too strong. In this sense, not only are beliefs guides to action (first sense of “habit”), but what we believe is partly influenced by what we *do*, a psychological fact already noted by Pascal and James (second sense of “habit”). In his writings, Pascal talked about the importance of “faire plier la machine” (“bend our body”) into certain actions that will reinforce our faith, like praying, going to mass, and so on. In his *The Principles of Psychology*, James stresses how emotions tend to be influenced by actions (we are afraid also because we escape, and we do not just escape because we are afraid): if this does not just happen with emotional states, a feed-back mechanism of this kind between action and belief is the basis for “the will to believe”. In general, facts of this kind explain *the importance of rituals in all religions*: the repetition of a certain behaviour tend to reinforce our faith by keeping away our doubts. Before asking ourselves when and whether this way of forming our beliefs is rational by comparing it with the method of science, let us complete our presentation of the method of tenacity by introducing its *two* stages referred to above.

Simply put, the first stage consists in arriving at any belief that is capable of terminating our doubt, while the second stage consist in sticking to the belief arrived at no matter what. As an illustration of the first stage, Peirce suggests us to “take as answer to a question any we may fancy” (see first quotation above). Clearly, “any answer we may fancy” implies that Peirce here is considering the termination of a state of doubt to be “the main object of our inquiry”. It is at this first stage, I claim, that the *desirability* of believing in *p* comes in: if *any* answer to a question is better than *no* answer at all, then at this first stage we are allowed to believe what we want it to be the case.

The second stage is instead where tenacity proper sticks in. After having formed our opinion, the maxim tells us to avoid any doubt coming from the inside (our own mind) and the outside (other people's opinions, something that Peirce clearly deems very difficult, considering the social nature of thought that he stresses in the remainder of the essay): «constantly reiterating it to ourselves, dwelling on all which may conduce to that belief, and learning to turn with contempt and hatred from anything that might disturb it» (Peirce 1877, *ibid*). Such a reversal of Popper's famous injunction to look for falsifications can be justified only if evidence for or against  $p$  is outweighed by the desirability of believing that  $p$ , to which we should stick. In this sense, we are not refusing to believe that our house is burning simply because it would be too painful, but we are simply trying to believe something pleasant about a subject matter  $p$  on which no clear evidence is available. The fact that believing can put to an end a painful state of doubt suggests to try to form an habit about believing  $p$  by looking for possible confirmations and avoiding possible falsifications of  $p$ .

Peirce is clearly aware of the power of self-delusion, since he adds that *naturally* «we tend to fill our minds with pleasant and encouraging visions, independently of their truth» (Peirce 1877, *ibid.*). Our tendency to look for pleasant beliefs may be a fact, but is it rational to choose to believe in this way even in cases characterized by total lack of evidence? An important, open questions, currently studied within evolutionary psychology, is whether there is an evolutionary based, and therefore “natural” tendency, to look for pleasant beliefs as answers to crucial questions of our existence. For instance, does the tendency toward pleasant belief together with “tenacity” help to explain the origin and apparent stability of religious beliefs?

While I cannot enter into this fascinating question here, in order to put forward a convenient label before moving to the method of science, let me define “pragmatism” as the

philosophy that encourages us to “entertain a belief by considering its consequences, and stick to it no matter what”.

Peirce’s method of science can be schematized and reconstructed by specifying the following maxims:

1) Let one’s beliefs be constantly shaped and revised by empirical, mind-independent regularities (laws) exemplified by natural phenomena;

2) Reinterpreting Peirce in the light of Lewis’ Principal Principle, we could add that whenever such regularities are only probabilistic, we should let our subjective degree of belief in  $p$  mirror the objective chance exemplified by phenomena.

In a slogan, nature’s “habits” (laws of nature) should become our own habits (beliefs): this is the essence of naturalism as I define it here.

It is important to try to uncover two different emotional attitudes that may lie behind the two methods of determining our beliefs: each attitude correspond somehow to a different human temperament. The distinction between these two attitudes will also come in handy in the section of the paper. Within the method of tenacity (that is, pragmatism), in some sense we try to adapt the world to our preferences, and the corresponding emotional stance could be regarded as Prometheus-like, since it entails a “rebellious” attitude toward the order of the external world, regarded as incomplete. Within the method of science (naturalism), we try to adapt to, and get our minds to know, an external, independent world order. The corresponding emotional stance might be the stoics’ *amor fati*, or Spinoza’s *amor intellectualis Dei* (joyous contemplation of the order of nature).

## 2 Why the apparent reasons of conflict between the two methods are really reasons for their complementarity

Let me first discuss three apparent reasons for friction between the two methods: 2.1 The different source of authority for the beliefs; 2.2 The different role of doubt; 2.3 Lack or presence of evidence. We will see that these reasons for conflict can be regarded also as reasons for the complementarity between pragmatism and naturalism.

### 2.1 The source of authority for pragmatic-based beliefs and naturalistic-based beliefs

Within the method of tenacity, there is no authority for our beliefs beyond our *human preferences*; a disagreement between two preferences cannot always be terminated in a rational way, especially if the desire in question is merely subjective. Within the method of science, the authority is “extrahuman”, since it involves a mind-independent, objective world-order.<sup>3</sup> If there is a way the world is, this hypothesis guarantees *objectivity* and intersubjective agreement among human beings; since regularities are *out there* to be discovered, different degrees of evidence between two conflicting beliefs can be evaluated in a rational manner.

However, granting this obvious difference, a first reason for the complementarity of the two methods is that at least some of our preferences (believing in  $p$  rather than not  $p$ ) can be regarded as part of the natural order, and can therefore be studied with the means of the natural sciences. For instance, a religious belief may have an evolutionary-based survival value, and its origin can be explained in a scientific way, if evidence is available. On the other hand, beliefs formed in accordance with the epistemic virtues of our scientific theories – the kuhnian norms of simplicity, fruitfulness, consistency, accuracy, scope, etc. Kuhn

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<sup>3</sup> For the sake of the argument, I here take for granted that a constructivist, post-modernist view of science is less plausible than its objectivist alternative.

(1978) – can be regarded as pragmatic norms that originate beliefs that can be rationally and tenaciously defended against their opposites. Sometimes, of course, pressure coming from the empirical world tells us give up simplicity since, for instance, ellipses are less simple than circles, but planets still approximately travel along ellipses. But other things being equal (for equally empirically adequate theory), we believe we should accept the simpler theory, in the same sense in which we tenaciously believe that the *consistency* of the new hypothesis with already accepted background knowledge is a precondition to accept the new hypothesis. Clearly, such higher-order beliefs in the simplicity, consistency and accuracy of our beliefs is not something we would easily give up.

## 2.2 Openness to doubt

This seems another significant, apparent difference between the two methods. Within the method of tenacity, doubt is inhibited and suppressed: our beliefs are immunized against it. Within the method of science, constant openness to doubt and revisability of our beliefs are traditionally regarded as the key elements for the progress of our empirical knowledge; the conjectural character of science has been famously stressed by Peirce himself and by Karl R. Popper.

However, as Thomas Kuhn taught us, tenacity in science *is* important, a statement that seems justified for at least two different reasons. First, there is a sense in which, in the so-called periods of “normal science”, *discussions about the foundations are simply cut off*, this is a precondition for the progress and the extension of the paradigm to new cases (Kuhn 1962, Feyerabend 1970). The second argument in favor of the importance of the method of tenacity *also* in science is that in many contexts, scientist *pursue* hypotheses without *accepting* them (Laudan 1977). Especially after the *discovery* of a new theory, its *pursuit*

(Nickles 1980) requires tenacity against foreseeable objections, and this attitude is rational simply because otherwise the *justification* stage would never be reached. Tenaciously pursuing a new hypothesis is a precondition to develop it and finally submit it to testing.

If this is true, the method of tenacity is not opposed to “science”, but is part and parcel of latter’s method, so that there is a sense in which pragmatism and naturalism are fused and entangled even within science. A good illustration of why science *is* a balance between pragmatism (tenacity) and naturalism (openness to belief revision) is in the following quotation:

«...science must strike a balance between being *too* resistant to change in basic ideas and not being resistant *enough*. If the simplest form of empiricism prevailed, people would throw ideas too quickly when unexpected observations appeared, and chaos would result. Ideas need protection or they can never be properly developed.» (Godfrey Smith 2003, p. 83).

The former defect (being *too* resistant to change) is due to a lack of responsiveness to empirical failures, or lack of naturalism. The latter (not being resistance enough) is due to a lack in tenacity, or lack in pragmatism. The kind of pressure from empirical evidence that a pragmatist and a naturalist undergo is therefore the same, it is only their response that is different, but different responses are needed in different moments! This takes us to the third apparent different between the two methods

### 2.3. The different function of evidence in the two methods

Decision theory – a theory of rational decision – shows that the two methods must coexist, since the rationality of our decision involves a balance between desirability and evidence (probability) of possible outcomes. The last part of Peirce’s quotation («dwelling on all which may conduce to that belief, and learning to turn with contempt and hatred from anything that might disturb it») suggests that it is rational to be tenacious at least in three

circumstances. The first is, as hinted above, when there is no sufficient evidence to fix our belief about a proposition  $p$ : if we desire the eternal life, and suppose that it is a case in which evidence for the existence of God is comparable with evidence against it, Pascal's wager is a case of this sort. Descartes' second provisional rule of morality is another instance of a situation in which lack of evidence requires tenacity in any belief that we have reached:

«since in action it frequently happens that no delay is permissible, it is very certain that, when it is not in our power to determine what is true, we ought to act according to what is most probable; and even although we should not remark a greater probability in one opinion than in another, we ought notwithstanding to choose one or the other, and afterwards consider it, in so far as it relates to practice, as no longer dubious, but manifestly true and certain, since the reason by which our choice has been determined is itself possessed of these qualities». (Descartes, 1637, second provisional moral rule of the Discourse sur la methode)

A second case in which tenacity is important is when we must act swiftly and cannot calculate all the consequences of a decision. Think of Herbert Simon's *models of bounded rationality* in decision making: this model requires deciding quickly and sticking to the decision as if it were certain or optimal, without yielding to doubts pushing us toward re-examining the decision. Third, the method of tenacity is relevant when the only way to achieve our aim is to believe tenaciously that we will succeed: *acting as if we could get what we want is often a necessary condition for getting what we want* (think of "jamesian" cases in which we don't know whether we will pass a difficult test and it is only if we convince ourselves that we can pass that we start working and can eventually succeed).

In all of these three cases, tenacity and science can be complementary both in the scientific method and in ordinary life's decision making. I will now discuss a case study in metaphysics in which tenacity is a rational way to stick to one's decisions.

### **3 A case study in metaphysics in which tenacity proves important: the determinism-free will debate**

There is an important debate in current metaphysics between the so-called *Libertarianists* and the *Compatibilists*. The former claim that there is indeterminism in the world (at least with respect to our actions), and that we are free<sub>1</sub> because in decisive moments of our lives we can act on the basis of the Principle of Alternative Possibilities. To be free in the sense given by “free<sub>1</sub>” means, in fact, that whenever we act in a certain way by performing an action *A*, *we could have done otherwise* (this is what the Principle of Alternative Possibilities guarantees). In each action *A* from which our character will depend, there are open possibilities to do something different from *A*, all of them being compatible with the same past: to be free in this sense requires indeterminism.

The Compatibilist, on the contrary, supposes that even if there were determinism with respect to the whole universe (our actions included), we would be free<sub>2</sub> to do *A* (or refrain from doing it) if (i) we wanted to do *A*, and (ii) nobody interfered with our will by threatening us, or nothing forced us to do *A* as if we suffered from a compulsive disease. This sense of “freedom” (freedom<sub>2</sub>) is compatible with the fact that our desire to do *A* is determined by laws and initial conditions dating back to events preceding our birth and therefore with determinism. Which of these positions is correct? Which of these senses of freedom is necessary and sufficient for our Freedom written with the capital F?

My thesis on this debate is as follows: lacking any relevant evidence concerning the fact that the world (or our actions) are subjects to deterministic or indeterministic laws, it is rational to stick tenaciously to the belief that we are free<sub>1</sub> in the libertarian sense *if* we so prefer out of our prometheic attitudes, or to the belief that we are free<sub>2</sub> in the compatibilistic sense, if we so prefer out of our spinozistic attitudes of “feeling one with nature”. Rather

than describing in more details these complex intellectual and emotional attitudes, I will now offer arguments to this conclusion.

First of all, there are reasons of scepticism at the physical level, at least if we look at non-relativistic quantum mechanics, with the notorious problems of interpretation of the formalism. The live possibility of a deterministic completion of non-relativistic quantum mechanics (as in Bohmian mechanics), in contrast to Ghirardi Rimini Weber's irreducibly indeterministic theory, have not settled the question whether the physical world at the fundamental level is deterministic or not, as Bohr's traditional view has it. Possibly the question is not empirically determinable in principle.<sup>4</sup>

But suppose that this statement is too controversial, and that we must accept some form of indeterminism at the quantum field level; it could be noted, in any case, that if we want to avoid the rather vague and unreliable merely psychological, introspective language, the relevant physical level of description of our actions should be the *neural* level. And at that level the quantum indeterminism should *not* be operative. However, currently, there is no known deterministic or indeterministic model of our actions at the neurophysiological or neuropsychological level, because there are no currently known mathematically formulated laws governing my choosing to listen to Mozart rather than Verdi right now. And without known laws there is no determinism or indeterminism. So why worry about the debate between compatibilism and libertarianism, if no psychophysical laws governing our behaviour are known?

The typical reply to this epistemology-driven question is that the debate involves a *conceptual* question of compatibility/incompatibility of our freedom in a possible world in which we imagine universal determinism or indeterminism, independently of what we know about our world and the laws governing it. And then we ask ourselves which of the two

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<sup>4</sup> For a review of interpretive problems of non-relativistic quantum mechanics, I refer the reader to Ghirardi (2005).

notions of freedom introduced above is compatible in these possible worlds, in which either full, ontic determinism, or full ontic indeterminism reigns.

However, an objection to this way of putting the debate is that we do not know what it *means* to claim that our counterparts in a logically possible world could be governed by deterministic/indeterministic laws, since we don't know what this means in our world. A second argument is that if we want to know whether our behaviour is governed by deterministic/or indeterministic laws *in this world*, we should not worry too much about merely conceptual questions of compatibility, because such "conceptual" questions are probably going to depend on partially verbal problems concerning the right way to define freedom, or to choose between the two different notions of freedom that I denoted by  $free_1$  and  $free_2$ .

Furthermore, at the classical level, which is the one that ought to prevail in describing the behaviour of single neurons and their interrelations, and as a consequence of rigorous theorems in ergodic theory, Suppes noted that:

«There are processes which can equally well be analyzed as deterministic systems of classical mechanics or as indeterministic semi-Markov processes, no matter how many observations are made...Deterministic metaphysicians can comfortably hold to their view knowing they cannot be empirically refuted, but so can indeterministic ones as well.» (Suppes 1993, p. 254).

By endorsing Suppes' quotation, I do not intend to deny that determinism is a metaphysical doctrine holding independently of predictability conditions (see Earman 1986, and Loewer 2008, among others). And we don't have evidence that processes underlying our actions could be analogous to those referred to in the quotation. The fact is rather that in practical deliberations, we must take into account the available evidence. This evidence underdetermines the choice of deterministic versus indeterministic models of our actions,

provided that the alternative between the two models is exhaustive, as it is currently assumed in the literature.<sup>5</sup>

In order to grasp concretely the philosophical consequences alluded to by Suppes in the previous quotation, let me discuss a concrete case. Suppose that we are facing the following alternative descriptions of the cause of a particular action, a theft committed by a person P:

- (i) in circumstances *extremely similar* to those in which a particular theft occurred, but not exactly identical, P could have refrained from stealing;
- (ii) in that very circumstance in which P did steal, she could have abstained from doing it.

Clearly, description (i) is compatible with determinism, while description (ii) isn't. The former in fact refers to the *type* of an action ("stealing"), of which we may have different tokens in slightly different circumstances. And if determinism holds, we can claim that in each of the tokens of an action/event we call "stealing", the past univocally fixes the future *via* unknown laws of nature and initial conditions. However, it may still be true that, in that type of actions (that is, in circumstances very similar to those that precede what we would describe as a theft), the agent P could have really refrained from doing what she actually did in that particular circumstance (P is not a compulsive stealer, and has a perfect control over her actions).

Suppose, furthermore, that the theft depends on a single neuron firing or not. Then, in a more complete description of (i), there is a 1-1 correspondence between a present moment  $t_1$  and a future deliberation in which there is no theft, because the neuron N24690 of the prefrontal cortex does *not* fire, while in the slightly different present situation  $t_2$  (in which that neuron fires), there is going to be that future theft. These two very similar possible present descriptions (or possible worlds) seem to be covered by a chaotically deterministic model, because two very similar presents are correlated to two very different futures.

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<sup>5</sup> Here I will not question this assumption.

Notice now that “the extremely similar” of the compatibilist version can be translated into a description which is identical “in all the relevant aspects” to the indeterministic version (ii), except that in the indeterministic description, the very same past is compatible with *both* dispositions of the single neuron N24690 to fire and not fire, and therefore with both stealing and not stealing. However, the “relevant aspects” of the previous paragraph are those that are explanatorily relevant and that are situated at the level of the psychological description of beliefs and desires, which can well be identical in the cases (i) and (ii).

It follows that the deterministic reading, in which the past is very very similar in the two cases (one in which the agent steals and one in which she doesn't) is epistemically and explanatorily indistinguishable from the indeterministic version of the action. It follows that there is a sense in which in both alternative possible worlds (deterministic and indeterministic), we can say that the agent could have done otherwise. And it is only if we bring in the neurophysiological description that we can distinguish the chaotically deterministic and the indeterministic situation. Now suppose that it is impossible to determine whether that single neuron will fire or not: this is not implausible if the net of neurons and their connections obeys chaotic determinism. Shouldn't we conclude that, practically speaking, the two descriptions, deterministic and indeterministic, are wholly indistinguishable? In this case, shouldn't we stick tenaciously to our preferred belief about freedom – maybe motivated by a prometheic or by spinozistic attitude – and resist to the sirens of the metaphysical debates?

This case seems another illustration of the importance of the method of tenacity. The first stage, it will be recalled, is to reach “any belief we may fancy”. In this case, this first stage transforms in the maxim: act *as if* you were free in your preferred sense (free<sub>1</sub> or free<sub>2</sub>). The second stage of the method is then “be tenacious about your belief about determinism or indeterminism”. In a word, naturalistic metaphysics should leave way to pragmatism.

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