

PHILOSOPHY SOUTH

The structure of know how

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"In the beginning was the Action"
(Saint John's Gospel, Apocryphal version).

Introduction

The protagonist of *The Stranger* by Albert Camus describes the funeral procession of his mother with these words:

At last we made a move. Only then I noticed that Pérez had a slight limp. The old chap steadily lost ground as the hearse gained speed. One of the men beside it, too, fell back and drew level with me. I was surprised to see how quickly the sun was climbing up the sky, and just then it struck me that for quite a while the air had been throbbing with the hum of insects and the rustle of grass warming up. Sweat was running down my face. As I had no hat I tried to fan myself with my handkerchief (Camus, 1946, p.11).

Looking back, I saw Pérez limping along some fifty yards behind. He was swinging his big felt hat at arm's length, trying to make the pace. I also had a look at the warden. He was walking with carefully measured steps, economizing every gesture. Beads of perspiration glistened on his forehead, but he didn't wipe them off (Camus, 1946, p. 12).

The characters walk, turn around, swing the hat; they only act and observe the world and the other characters. No words are pronounced, except for short information exchanges, which are idle in the circumstances:

"Is it your mother we're burying?"

"Yes," I said again.

"What was her age?"

"Well, she was getting on" (Camus, 1946, p. 11).

They know where they go, what they are doing; they go to the cemetery, adapting their movements to the different circumstances. Their behavior is radically

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different from the subject of the discursive propositional knowledge, and yet they know what they do, what they plan and how to carry it out.

Are they represented by the propositional theory of knowledge? My answer is that they are not, although this type of behavior is prevalent in human society.

Know what, know how

It is known that knowledge has been regarded as essentially propositional. From Plato up to now it has been studied on the basis of a well-known scheme by which a subject knows a proposition "p" if he believes in that proposition, if it is true, and if he has adequate evidence for its truth.

In this context, the usual discussions about human knowledge have involved a careful elucidation of the concepts used in the previous scheme and others related to them: subtle distinctions between belief and knowledge, possessing or having, their various uses in natural languages or their logical analysis, the possibilities of talking about truth, the nature of propositions, etc. Even the differences between empiricists, rationalists or hypothetical deductivists can be seen as simple ways of constructing the adequate evidence of p.

According to the traditional theory of knowledge, the behavior of "s", the epistemic subject, might be seen as a machine that is always generating propositions that make it possible to successfully deal with the multiple occurrences of everyday life. This image of s does not correspond to the actual subject of common knowledge, that spends his time mostly going through the world, acting in it, with a logic that is detected in the sequences of actions carried out to pursue his objectives, which are finally accomplished, but does not enunciate any propositions at all to do this. He knows the universe of his interactions, transforms it with intelligent actions, without a set of statements that preannounces every move. In everyday life, the informative function of language is poor compared to the affective stories, the impressions he describes, the brief "small talks". The information he gives usually consists of short instructions accompanied by practical demonstrations. The common subject of knowledge is essentially a practical subject, poorly reflected by the logos of propositional epistemology. When this practical subject is asked to describe verbally his skills, it is probable that he is unable to do it; even more, if he tries to do so, the simple fact of becoming aware of what he is doing causes a decrease in his ability.

Although the difference between theoretical and practical knowledge is known by classical authors, the analysis devoted to the latter is scarce and insufficient. The former is termed "knowing that" or "know that" (knowing, for example, that Kant is a philosopher), and the latter "knowing how" or "know how" (knowing how to play tennis). The number of pages dedicated to one or the other is an index of the importance attributed to them: the know-how is usually contained in a few pages or simply just mentioned.

The smart skills possessed by peasants, factory workers, technicians, artists, i.e. the kind of intelligence that creates the material world in which human culture develops, are usually not considered in philosophical reflection.

The importance of knowing how is stated only in the isolated voices of Marx (1969) in his "Theses on Feuerbach"; Price (1953), for whom action is intelligence even in animal life; Wittgenstein (1958), who considers any kind of knowledge as a sort of knowing how; Piaget (1941a) who takes action as the very foundation of his theory of knowledge; Polanyi, with his tacit knowledge (1964), and all the pragmatists' program.

The theoretical structure of “know how”

After having established the importance of the knowledge implied in human actions, which in its simplest form can be stated by saying that we do not declare that we will walk three meters to the door, open it and then go to the yard – or run to the ball, hit it slowly with the middle of the racket and send it toward the net on the rival field –, we just do it, I will elucidate the structure that explains how it is it possible.

In that sense, my claim is that this practical knowledge can be reconstructed as a quasi-theory, similar in structure to those of science.

Let us remember that roughly an empirical theory consists of a structure of three related levels:

- (i) an empirical level, closer to experience, describes the phenomenon that scientists try to explain;
- (ii) a theoretical level, and
- (iii) at least a general law that relates both levels.

Let us think of Newton’s mechanics, with an empirical level of particles in movement, that does not need any Newtonian law to measure that movement – acceleration, in mechanist terms –, only relates time and distances. All we need is a watch and a meter.

The other level, the theoretical one, is added by Newton – force and mass –.

These terms, together with those of the empirical level, allow him to formulate the main law of mechanics, which relates all of them, explains and also predicts the positions of all kinds of particles after a certain time. This is the well-known first principle of Newtonian mechanics:

$$f = m \cdot a$$

that is, force is equal to the product of mass and acceleration.

This means that if “knowing how” can be reconstructed as an empirical theory, similar to the paradigmatic scientific theory, Newton’s mechanics, it must consist of two levels: the first level, let us call it *empirical*, that can be observed by anybody, and another level, proposed by the theoretician, a *theoretical* one. Both levels are connected by a law that explains and predicts what happens in the empirical level.

Notwithstanding, practical knowledge has some peculiarities that are better captured if we consider the two levels as two different theories, one of them “empirical” related to the other.

The first – empirical – theory consists of the description of movements of all kind done by an external observer as a sort of behaviorist researcher. He can even measure the movement as usual, with a watch and a meter.

The other theory – theoretical relative to the empirical theory – consists in dispositions possessed by the practical subject that performs the actions assuming that if there is no such a dispositional knowledge, actions are not possible.

The latter characterization adopts the form of a quasi-transcendental argument.

We propose to show the structure of practical knowledge in a similar way as in Newton’s mechanics:

- (i) first we reconstruct the behaviorist theory,
- (ii) then, the dispositional theory,
- (iii) and finally the know how theory as the result of linking the two theories into a single structure.

Those structures will be shown in an informal language and by means of diagrams instead of set and model theories, with no less accuracy than the latter but simpler and easier to understand for those not trained in formal methods.

The quasi-behaviorist theory

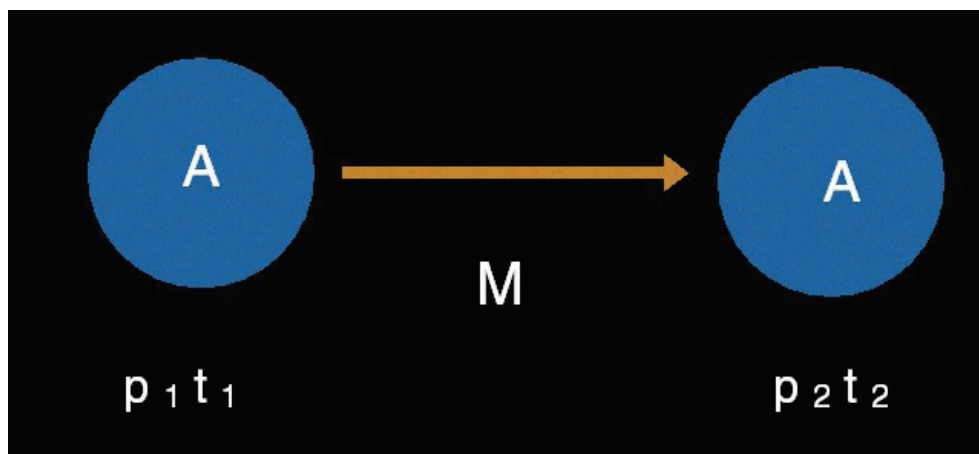


Diagram 1. The quasi-behaviorist theory.

For the sake of graphic clarity, in the diagrammatic representation of the theories (Diagram 1) we use letters to be read as the following terms and statements:

- (i) A is the practical subject, or he with the elements he uses, or with another practical subject
- (ii) "p" is "position"
- (iii) "t" is "time"
- (iv) the arrow "M" relates A in an initial position (p1) in an initial time (t1) before starting to move to the position (p2) in the final time (t2) at the end of the movement of A.

This last statement can be read as the empirical law that describes the movements of the practical world in a behaviorist manner.

So far, we have shown the structure of the empirical level of the know how theory in its similarities to Newton's mechanics.

It is time to speak about their differences.

To Newton, space has a Euclidean structure and its measures are objective. Time is also objective and can be measured by a watch.

Practical time is different, and also practical space and its character are qualitative – not quantitative – as we will see later. Besides, the movements are too complex to be measured. Think of a tennis player or a painter and their movements (or Maradona, the famous soccer player) that vary in speed and in directions all the time.

The M in our diagram is an idealization that considers only the beginning and the end of the movement – as Taylorism does in order to measure time so as to standardize procedures –. Actual know how movements are too complex to be represented by a diagram.

It is better to use a video camera if you want to do so. After all, videos are the best way to represent movements.

The know how time

The time of the practical subject differs from the time of the observer in that its extension does not depend on equal lengths crossed in equal intervals – as happens with the clock –. He develops a practical time that is ruled by action. The practical subject measures time by the sequence of his own actions, the fulfillment of his goal, as well as the comparative speed of the events.

This qualitative time is superposed upon a quantitative time based on the motion of the clocks, that measure the working hours as well as the sleeping hours or the ones dedicated to pleasure and rest; in fact, the whole day and night are marked by quantitative measures of time, and the coexistence of both times is the rule.

The know how space

The space of practical behavior differs from the Euclidean space of Newtonian mechanics, since the distance to objects and between objects does not need to be measured exactly in centimeters or meters to succeed in doing “p”. Another important difference is that the practical space is not absolute and independent from the furniture of the world. On the contrary, space is a relation between objects and does not exist without them.

Space is better understood as a qualitative, topological space, in which the notions of very near, near, far and too far are sufficient to explain how a practical subject acts. These qualitative notions are acquired in practice, and the criterion to classify objects in this way comes from the first experiences of the epistemic subject when he has to reach things with his hands and classify them as those who are immediately reached, those who are slightly more distant, other that are at the limit, but still reachable, and others that can be reached only if he moves towards them.

From a theoretical point of view, we may adopt Hempel’s characterization of qualitative concepts. Unlike the concepts of class, they suppose a complicated logical relational structure.² Once they are introduced in our analysis, we are not free to reject or modify their structure, accepting that the qualitative concepts we attribute to the practical subject satisfy the requirements enunciated by Hempel that indicate that they are not totally conventional because they must adjust to two conditions:

- (i) they must be applied to the facts of nature;
- (ii) they must adjust to a logical structure of relations.

These conditions stipulate that given two objects “a” and “b”, either they are *equally distant*, or “a” is *nearer than* “b”, or “b” is *nearer than* “a”.

The first relation – *equally distant* – is symmetrical and transitive. It allows us to place the objects that are at the same distance from the practical subject.

The second – *nearer than* – is asymmetric and transitive. It stipulates a “quasi serial order” of the objects by levels of distance in different strata.

These relations allow us to propose a metaphoric model of practical space by imagining it as if the practical subject were surrounded by concentric spheres – a model taken from Aristotle’s astronomy – in regard to which objects are classified as those that are within his reach, those that are at the limit and those that are beyond his reach; probably we must add another stratum to the configuration of space, which consists of those things that are out of that limit, but can be reached by means of some instrument.

² Quoted and developed by Carnap (1966).

Let us think about our desk and those objects that are immediately reached by our hand, those that are slightly more distant, others that are at the limit, but still reachable, and others to which we have access only if we move towards them. This situation does not differ if we consider the distribution of the working tools of a craftsman, an artist or a surgeon.

So far we have considered the practical space of a subject that remains in the same place.

We must think now about how space behaves when he moves. In this case, the spatial relations between the practical subject and the objects that surround him changes in the same sense. We can say in our Aristotelian model that the sectors of spheres remain, but the objects change the sphere of belonging, in such a way that the distant ones becomes less distant and finally near and very near. This qualitative change is the possibility of reaching them and finally manipulating them. This correction, at every instant, of the distance that separates him from the objects in a constant approaching is central to achieve the precision needed by the manipulation.

We now have to characterize the kind of knowledge possessed by the practical subject and that allows him to act in the world.

The dispositional knowledge

We state – and this is a kind of axiom of our reconstruction – that a practical subject “x” knows how to do “p” if his action “p” is adapted to a given situation “q”.

This definition implies, besides the ability to act, that “x” recognizes a specific situation and acts according to that situation.

It entails that in the recognition of a specific situation “q”, by perception “o”, the latter is linked to practice “p” being “o” a perception not only visual but also tactile, olfactory, gustatory.

Our claim is that the know how knowledge attributed to the practical subjects consists in dispositions, regarded as systems that have the property of being activated by external stimuli. This characterization of “dispositions” avoids circularity since it does not include any of its synonyms.

In turn, the practical subject understands – and acts accordingly – that objects possess the disposition to behave in a certain way when he acts on them. According to Piaget’s terminology, the eminently practical subject of the first stage of the genetic development of the epistemic subject –the sensory motor stage – classifies objects with quasi-practical dispositional predicates such as “suckable”, “graspable”, “throwable”, etc. (Piaget, 1941a). This classification of the world survives in the adult when he applies his practical knowledge to a tennis racket, to an artist’s canvas and pencils, or to a surgeon’s knife.

That is why the dispositions of being able to act on an object in a certain way presuppose that the object has the disposition to perform that specific action – if the practical subject is able to throw some particular object, that object is classified as throwable –. And perhaps the whole physical world can be seen as systems that possess the disposition to behave according to certain laws. Popper (2002, p. 445) was arguing something similar when he stated that the universal terms as “broken” or “dissolved” are dispositional because you denote something with them if it behaves – given certain initial conditions – in a certain or law-like manner. We can term something “water” if it smells and tastes like water –, and therefore it needs to be tested. Perhaps is not clear enough to the readers that Popper was switching from the *meaning* of a term – a conception that in those years he rejected as metaphysical – to the context of *using* a term.

I agree with Piaget that the dispositions are the result of the internalization of the schemes of actions carried out by the practical subject when he operates in the natural and social world, guaranteeing their repeatability in similar situations.

But these practical dispositions that in the beginning are very simple and become complex following the rules of association, are continued in the process of acquisition of new dispositions and – and this is the most important part of it – in definite epistemic communities, such as those of arts, techniques, sports, games, jobs and – why not? – science or philosophy. Those abilities are learned – interiorized – by practicing them by means of imitation, repetition, controlled variables, in a process that does not exclude verbal indications. The constructive dispositional process allows us to refine and improve knowledge and to create new ones.

The dispositional theory

It was mentioned above that a theory has two levels, one empirical and one theoretical, both related with at least one law, and that in this special case it was better, in order to understand the structure of the know now knowledge, to reconstruct it as two theories, one more empirical, of describable actions – termed *behaviorist* –, and another one theoretical, termed *dispositional*, of a psychological and cognitive character. The reason for doing so is that both theories establish the behavior of its components by means of a specific function and that they are efficient in two different ontological systems.

The behaviorist theory has being characterized previously. The next step is to reconstruct the dispositional theory, and afterward unite both theories with a law.

We will show the structure of the dispositional theory by a diagram, with its elements and its relationships, and explain them briefly.

The diagrammatic structure of the dispositional theory

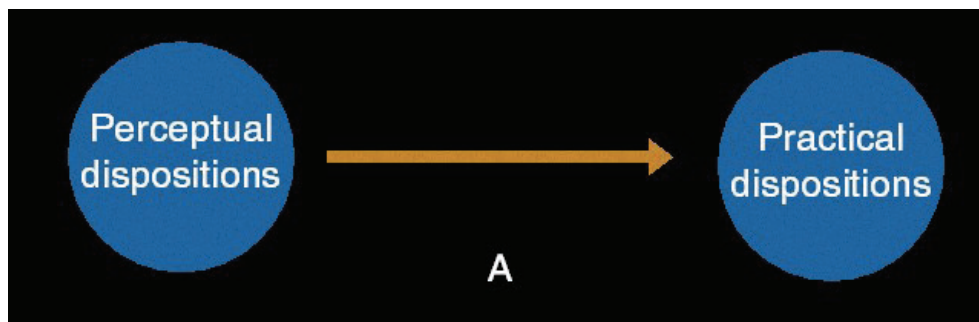


Diagram 2. The dispositional theory.

The dispositional theory is also very simple. Diagram 2 shows the arrow A connecting specific perceptual dispositions to specific dispositions to act.

So far, the dispositional system remains inactivated. It is waiting for a stimulus that awakes it. When that happens, the perceptual dispositions generate specific Gestalts and the practical dispositions generate specific actions.

It may not be sufficiently explicit that using the notion of disposition excludes the possibility that the psyche is an almost infinite deposit of images and actions, some

of them chosen at a given time. What is proposed is the existence of devices –the dispositions- that build Gestalts as well as actions under the influence of certain stimuli. Let us now analyze this more closely.

The perceptual dispositions and the Gestalts

We understand perceptual structures of practical knowledge as a structured set of rules that are triggered by the reception of a stimulus, reconstructing more or less accurately a Gestalt formed before in the interaction with the natural and social world. As we saw, the fact that this perception is internalized together with these interactions gives them practical meaning and leads to specific practical dispositions.

They are not simple structures, limited to vision. They include auditory, olfactory, tactile and proprioceptive perceptions, often interrelated, generated in paradigmatic situations, and allows the practical subject to recognize when another situation is similar to the paradigmatic one.

When an actual perception stimulates the dispositions and generates a Gestalt that activates practical dispositions, the subject acts according to the recognized situation he is experiencing.

Current Gestalts relates to other Gestalts that anticipate the result and effects of the actions that the practical dispositions will generate.

Needless to say that this ability to anticipate events and the results of one's actions involves the recognition of a causal link between what is perceived and what will happen next.

H.H. Price says something like that when he analyzes what he calls "the cognition of the sign, the type of cognition in which something that is not experienced directly is brought to the mind by means of a sign".

He claims that this is a preverbal form of cognition that does not depend on the words and is narrowly tied to the action, since the sign of a future state of affairs is at the same time a sign to act in a specific way. He exemplifies this with the swaying of a cyclist who is front of a car as a sign of a predictable accident, and that anticipation triggers a sequence of actions that leads the driver to push the brake. In this example it is very clear that the sign triggers the warning and the action in the absence of words: the immediacy of the response demands that one should not waste of time with verbalizations or mental imagination.

He says that this type of cognition presents some characteristics that assimilate it to what traditionally is assumed to be an exclusive form of propositional thought, such as foreseeing in absence or being mistaken.

But this is not the practical thought that we are basically interested in, though it is the first step toward more elaborate forms.

We are interested mainly in the most diverse traditions of thought developed by specific epistemic communities and transmitted by its experts. They teach the apprentices a peculiar way of perceiving and doing, qualifying them to solve successfully the problems that are interesting for their tradition.

Let's think about plastic arts, about painting, with their technologies and skills refined throughout the centuries, learned in a practical manner in the art workshops, or the intelligent skill of surgeons that solves the most intricate technical problems so as to cure a disease.

These dispositional structures no longer belong to any specific subject, but to human culture, human traditions, shared by the members of a particular cultural community, as a result of a common learning process.

Relating both theories: The structure of the know how theory

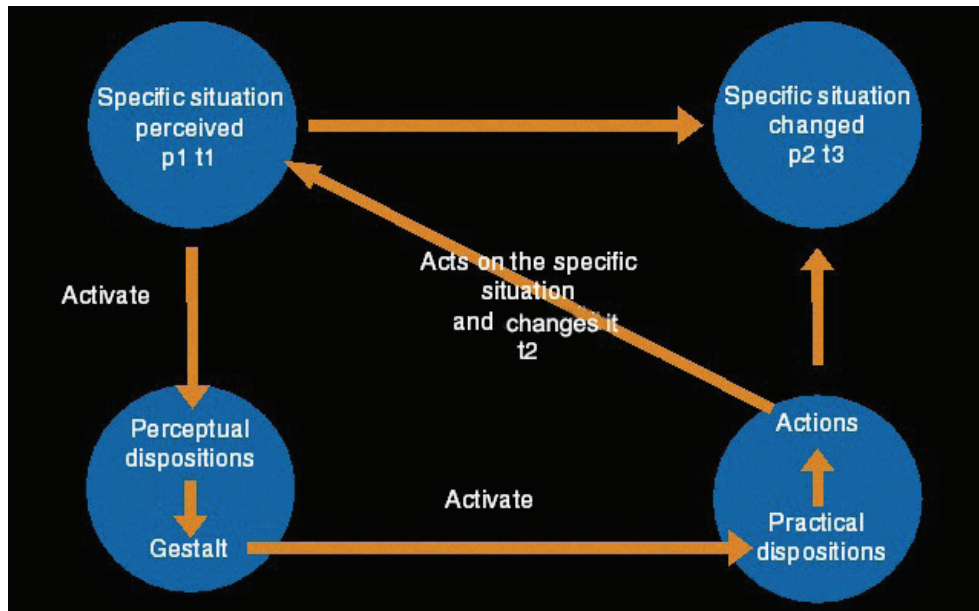


Diagram 3. The know how theory.

As previously done, I will show this relation by means of a diagram (Diagram 3).

A specific situation in position p1 is perceived in an initial time (t1).

The perception activates a specific perceptual disposition that generates a Gestalt similar to the one generated in the former perception of a similar situation in which the practical subject acted.

The Gestalt activates a specific practical disposition that generates actions similar to those in which the practical subject acted in former experiences.

The specific action acts on the specific situation (t2) and changes it.

Finally, the situation changes (t3) in the desired manner (p2).

Now we can state the law that rules the whole system. If:

- (i) a "specific situation 2" in the initial time "t1" in the position 'p1' is perceived by the practical subject "s" as a situation he wants to change, and
- (ii) the "specific situation 2" is similar to the "specific situation 1" in which "s" acted, then
- (iii) the perception activates the perceptual dispositions that generate the "Gestalt 2" similar to the "Gestalt 1" of the "specific situation 1" and
- (iv) the "Gestalt 2" activates the "practical dispositions 2",
- (v) then, the practical dispositions generate actions of "s" in "t2" that change the "specific situation 2" to position 'p2' in 't3'.

The motives for acting

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A central supposition in our analysis is that practical knowledge is not isolated in the human psyche, but is intimately connected to other sectors of it.

Among the motives for acting we will place those external stimuli that trigger the functioning of a few sectors instead of others.

The origin of our worries can be summarized in a couple of questions:

- Why is it better to do something instead of doing nothing?
- Why do it in a certain way and not in another?
- And finally: what is the engine that moves human behavior?

At the risk of being incomplete, we will try the following list of answers.

- (i) Because we follow internal very basic impulses, physical elementary needs, such as hunger, thirst, cold, sex, which are satisfied by following the practical rules imposed by culture.
- (ii) Perhaps we may add to them the cognitive impulse, which is responsible for the major adaptive tool of the human species,
- (iii) Because we try to satisfy other basic instincts not often considered, such as the need for affection, for recognition, for sociability, that a gregarious animal such as man only satisfies in the company of other human beings.
- (iv) Because actual perception is connected with other Gestalts of previous events internalized with the affective tone, the practical subject wants to repeat the experience – if it was a pleasant one – or to escape it – if it was an unpleasant one.
- (v) Because we follow habits and customs of everyday life.

Finally, let me mention the motive that is one of the largest human passions: creating something valuable for their own cultural communities, the impulse to be recognized as a valuable scientist, a talented artist, a remarkable athlete, a surgeon of merit, an original philosopher, a generous philanthropist, a benefactor of humanity, or just an honest and reliable craftsman, a physician loved by his patients, a teacher with disciples, so as to escape from insignificance, oblivion and death.

Summary

In the development of this writing I presented adequate reasons to establish the importance of the much neglected practical knowledge, its structure and the type of intelligence that it implies.

This kind of knowledge was reconstructed as two different theories. One of them – quasi-behavioral – describes the actions of a practical subject. The other, of a psychological and dispositional character, is postulated as a necessary condition of possibility of that behavior.

Both theories were linked in a unique theory, the know how theory, that explains observed actions in psychological terms.

The practical subject acts, and the reasons for doing something – and for not doing anything – lie in motives of a biological, adaptive nature, but also of symbolic and social importance.

Perhaps something will be missing in this paper if we do not mention here: the relations between language and action, between knowing how and knowing that.

We will discuss it through some short statements whose justifications can be grasped from the previous developments:

- (i) the epistemic subject is essentially practical, non-linguistic;
- (ii) practical knowledge is most of the time independent from the utterance of linguistic indications;
- (iii) practical knowledge is genetically previous to propositional knowledge;
- (iv) propositional knowledge is tested in practice.

At the end of this writing, I advance a thesis that closes the circle that began by stating the central importance of knowing how:

“Propositional knowledge is also a practice.”

I will not develop the reasons to justify it. I will only state that language learning consists in the internalization of signs – words – in a process that is inseparable from the internalization of images –Gestalts– of paradigmatic objects and their practical manipulation. It also involves the internalization of rules of various kinds, such as the constructive, grammatical, argumentative and stylistic ones; at the beginning imitating the others, but soon the practical subject constructs and innovates language in his own manner.

But this is another story that will come next.

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