Teorie & Modelli

The minimal features of the Experimental Phenomenology of Perception

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Abstract

In this paper we will argue that the basic, minimal elements for the Experimental Phenomenology of Perception (EPHP) can be defined based on internal features characterizing it, as the origin of the term "phenomenology" reveals. In particular, we will show that explanation and falsification are not external attributes of this discipline, i.e. they are not part of this discipline due to the application of external epistemological requirements. Rather, they are intrinsic parts of its skeleton. We also suggest that this search for the pre-epistemic foundations of the minimal features of the EPHP can be extended beyond the concepts of explanation and falsification considered here. Our proposal is developed within a "regionalized" perspective of scientific knowledge, a perspective which has already been seen in the current debate in the field of the philosophy of science.

Introduction

Before making a contribution towards clarifying the identity of the Experimental Phenomenology of Perception (EPHP) and establishing exactly where boundaries lie, one must first decide which of the many possible aspects to focus on.

Some might argue that such a troublesome task can be avoided. Indeed a list of the phenomena, results and data pertaining to the EPHP would seem to suffice and no epistemological or theoretical references are required. If the facts speak for themselves, then there is no need to go any further: a long list of phenomena (*à la Gesetze des Sehens* by Metzger, 1936) inserted in an on-line database and supported by an efficient research engine should be enough to justify the existence of the discipline. However, this would be like looking at pictures, frescoes or sculptures without any reference to history of art which explains their

context and gives us a glimpse of the thoughts and ideas which inspired them and of the critical differences and similarities characterizing them.

Another way of approaching a definition of EPHP would be to start from a historical perspective. This would reveal why it is independent from philosophy as a discipline and would identify the features which characterize it as part of the psychological tradition and which distinguished it from Gestalt Psychology (if in fact this is true). On the basis of this and in line with the rules and criteria which provide the guidelines underlying the contemporary classification of scientific disciplines (see *The MIT Encyclopedia of the Cognitive Sciences*, 1999; Marconi, 1982), one might establish the hierarchical relationship of the EPHP with respect to other adjacent fields, such us cognitive sciences and neurosciences… The rigorousness typical of historians or philosophers of science would guarantee that, in doing this, we do not to succumb to the temptation to invade or be invaded by other disciplines due to current trends or prejudices which presume, for example, that the "technological race" (e.g. neuropsychologists "armed" with FMRI) is superior.

Yet another approach (although by no means the last one) involves showing that the basic features of the EPHP have their roots in its genetic structure rather than in phenotype or behavioral identity as defined by the methodological conventions of the scientific community. Even if there is the chance that the genome of the EPHP turns out to be the foundation of science itself and not vice versa. In order to develop this approach (while at the same time heeding Bozzi's warning as quoted in the next section), we will permit ourselves to theorize a little. Starting with some etymological considerations, we will show that the EPHP possesses inherent traits which are the same as those that the philosophy of science considers to be epistemologically necessary for the characterization of experimental sciences. These traits are natural elements of the EPHP - more or less in the same way as the perceptual properties of the phenomena studied by the EPHP are part of the phenomena themselves.

Etymology

It is the conviction of some researchers (and in this case the sample is from the population of psychologists) that talking about philosophical or epistemological matters is not helpful and may even be obstructive, given that these matters have to do with "words" and not with "facts". Without opening an old question which might lead us to reconsider the influence of this idea on northern-east Italian psychology, we would like to quote some passages from Bozzi's last magistral lecture (2002): "The theoretical intolerance of some of my teachers has been a serious obstacle to the diffusion of the results of our research – as well as the research of Michotte and Rubin, the Japanese school and sometimes also the

experimental findings from Uppsala – in the rapidly changing scenario of contemporary psychology. I used to say that every generation must re-think its own theories from the beginning, but this idea was considered a philosophical chimera, an insidious historic obsession, and even, at times, a heresy." (Bozzi, 2002, p. 38).

If we accept the idea that we need to deal with "facts" as figures (pushing any theoretical discussion to the background) and that philosophical thinking is useless (even if most thoughts regarding scientific method and the truth values of descriptions, explanations and theories have been developed in this way), then we have already renounced a vast territory within which the profile of the EPHP may be traced. Giving up the idea of preserving theoretical analysis along with the "facts" does not necessarily mean that this will help make the identity of the EPHP any clearer. We believe that the same care that has been devoted by the founders of the EPHP to recognizing the importance of these "facts", without limitations and preclusions, should be devoted to completing the search of the fundaments of this discipline. Keeping this in mind, here is a further consideration to add to what Bozzi had to say.

The term "phenomenology" is not a generic term. It neither changes nor has a variable meaning, depending on context, habits or culture. If we look at its etymology, we discover that the root φαίνω gives origin to a series of meanings containing pre-epistemic implications, which in turn affect the structure of the scientific method:

"**1**: *show, appear; manifest; bring to light; indicate; point; make known; declare; remark; reveal* (…)

3. it may frequently be used to mean *seem, appear,* even though there are other words with the same meaning : δοκέο, *videor*, while φαίνομαι is *it appears* or *I appear*".

This etymological root implies the epistemic foundations of the EPHP in the same sense in which a square implies right angles. Let's consider what happens when a person gives directions and *shows* someone where to go, e.g. the city museum. Any reference to the route that is being indicated are fundamental and the action of pointing constitutes in itself an explanation. Furthermore, alternative or incorrect routes are necessarily implied (e.g. turn left implies do not turn right and this may be even verbally expressed). The certain or uncertain tone of voice is also inevitably present during the act of indicating and it is critical, as it tells how reliable/unreliable the explanation is. All these factors are essential and cannot be eliminated. However, it may be that the person giving directions is unsure and uses phrases such as "it seems to me that", "I'm not sure but…." etc. But this case the directions appear less reliable and the "force" of the explanation is automatically diminished.

Tautologies? Sophisms? Nothing of the sort. The fact that the place or object being indicated is objective is fundamental and other aspects of the experimental process derive from this: not only the right question to ask,

but also what kind of demonstration is required along with any incorrect alternatives (e.g. turn right, not left; don't turn, go straight ahead…). The correctness of the directions can be confirmed or otherwise disconfirmed as they are followed, step by step, based on what we see, and ending with the final realization that the name of the museum we were looking for appears on the building in front of us.

Explanation

For some years now we have been using Vicario's textbook "General Psychology" (2001) with undergraduate philosophy students attending the course of General Psychology, to their great satisfaction. In more than one place, in this textbook, Vicario discusses and exemplifies what should be meant by the term "explanation". The following quotation is from Chapter 3, on "Epistemological questions": "The explanation is the discourse we demand when we want to know why a certain phenomenon takes place or what causes it. (Note that [in Italian] "spiegare" [=to explain] means "to unfold" – and is in fact opposite to "piegare" [=to fold]: this aptly expresses the operation of unfolding something which is folded revealing what is inside.) An explanation usually consists of showing that the phenomenon or fact in question is part of a class of phenomena which can be predicted on the basis of a law. In this way, an explanation shows that the description of the phenomena in question can be logically deduced (a) from statements concerning their antecedent conditions and (b) from general laws" (Vicario, ed. 2004, p. 70).

It seems to us that his is a good way of describing what we should mean by "explanation", for at least two reasons.

On the one hand Vicario recognizes a first meaning of the term explanation which is ontologically inherent to the act of "showing a phenomenon". This is further clarified (p. 150 ff.) when he declines and exemplifies the meaning of "explain" as in the case of a phenomenological explanation. He uses two examples, both involving visual perception: the Benussi effect (1916) and the Fuchs effect (1923) – the latter in Metzger's version (1975). The demonstration of these effects is made in the style of a "pure" phenomenological demonstration, which makes it clear why the explanation of a phenomenon cannot be independent of what is being directly observed – in the same way as a phenomenological explanation (in the first etymological meaning of "showing" or "indicating") of the direction we need to take to reach the museum cannot ignore the elements that can be directly observed in the surrounding environment (a road off to the right, the road turning left, the overpass, the name plate of the museum). And this, as stated in the previous section, is not a consequence of assuming epistemological or methodological prescriptions but simply takes into account the meaning of the root φαίνω.

In addition to this first aspect – i.e an inner, inevitable component of phenomenological explanations – Vicario's definition also recognizes that in any explanation of phenomena things like classes of phenomena, logical deductions, antecedent conditions and general rules come into play - in addition to, as we will discuss in the following section, a structure of falsification which is again constrained by the spontaneous organization of the perceptual world.

Once this has been established, it is still necessary to clarify the relationship between classic ("pure") phenomenological explanations and the kinds of explanations which refer to the "arguments" which are a classic part of the vocabulary pertaining to the philosophy of science (logical deductions, antecedent conditions, general rules, principles, etc.). One example is the reference to Lorenz's principle of the hierarchy of descriptive levels, very dear to Vicario.

Unless we want to be dogmatic and state that the EPHP is impermeable to all remarks made in adjacent areas regarding the analysis of the term "explanation", a suitable solution is to try to understand if there are any definitions which cover various kinds of explanation, while at the same time preserving their "regional" differences (in a co-planar rather than hierarchical architecture).

In the following pages we will make frequent references to the analyses and definition presented by Boniolo and Vidali in their textbook on the Philosophy of Science (1999, chapter 6).[1] While helping to settle this question in a systematic way, taking into account historical factors, this chapter also encourages more regional analyses, thus also contributing towards establishing a possible meaning of explanation in the EPHP.

"What is a good scientific explanation? (…) No matter how good the various answers that have been proposed during the last few centuries might appear to be, not even the most reliable can really be considered as definitive.

In C.G. Hempel's view (1966, p. 79-80), a good scientific explanation must meet the two basic requirements of explicative importance and verifiability. For Popper, a falsificationist par excellance, explaining does not mean reducing the unknown to the known, but rather begin able to propose viable theories (Popper, 1963, pp. 104-5). W.V.O. Quine, on the other hand, paid particular attention to the linguistic component of human knowledge and declared that the aim of an explanation is to protect the current use of terms, in typical or "privileged" contexts, at the same time making their use clear in different contexts (Quine, 1961, p. 24). Salmon felt that it was not enough to show that a fact can be derived from a law, but that the existence of a causal connection between explanans and

[1] The texts of Boniolo and Vidali (1999) are paraphrased and terms translated into English may not be the same as those used by the original authors (pp. 426-503).

explanandum was also required: in other words, explaining implies knowing the underlying mechanism, it means "opening the black box of nature" (Salmon, 1989-1990, p. 219; 226). From a pragmatic perspective, B. van Fraassen considers a scientific explanation as a relationship between a theory, a fact, and a context, in reply to a specific question: its scientific nature depends on the kind of information used to establish this relationship (van Fraassen, 1980, p. 194)." (Boniolo and Vidali, p. 426-427).

Going on from all this, Boniolo and Vidali went a step further and established a set of factors which in turn are used in the definition of a "regionalized view" of scientific explanations:

i) *The topic of the question* (TQ): i.e. the "explanandum". It is considered to be true by the person asking the question, even though it has not yet been explained.

ii) *The set of antitheses* (SA): this comprises both the proposition TQ and its (n-1) alternatives. These propositions correspond to various alternative ways of interpreting a question. They are extremely important in terms of the orientation of the explanation. This set therefore establishes the background to the question TQ. The set of antitheses is often obvious and is thus not explicitly referred to.

iii) *The relationship of relevance (R).* It is very well known that there is no objective relationship of relevance between the astral configurations present on the day when Kenney was born and the day of his death and therefore we need to find a way to exclude such explanations. If we are not able to impose specific conditions requiring the objectivity of the relationships of relevance, then we will never be able to characterize the scientific explanation in a satisfactory way (Salmon, 1989-1990, pp. 238, 243). If anything, the real question is how to describe these relationships, without necessarily considering all of them acceptable but rather limiting them by means of a further factor: the epistemological structure of the related background knowledge.

iv) *Background knowledge (BK)*: there are three aspects pertaining to the epistemological structure of background knowledge:

1. *The background of the discipline* (BD): The first aspect concerns disciplines themselves. While at the same time acknowledging that the term "discipline" is generic, we can however say that all questions refer to a potential area of knowledge which may provide answers. This may be physics, medicine, sociology, biology or history… that is, one of the classic disciplines which over time have been separated from other disciplines by means of various attempts at partitioning, which aimed at justifying and establishing these distinctions.

We could say that these disciplines are mere academic fences, but this does not change the fact that partitions in knowledge systems – and also scientific knowledge systems -– have a heuristic value, even when they are provisory. Furthermore, it is always pragmatically possible to decide

whether a theory, a principle, a law that is used in a reply belongs or not to that specific discipline. When the phenomenon of "a falling stone" is analyzed, no-one today would accept a reference to the earthy as opposed to aerial nature of stones as a scientifically relevant answer in the domain of physics. This answer is however acceptable if the background is that of a different discipline, e.g. the history of philosophy (or the history of physics).

2. *The background of the topic* (BT). The epistemological structure of background knowledge is also defined with regard to the topics that specific background knowledge deals with and, consequently, of the methods and tools which it adopts in order to solve them. It can be the case that different types of background knowledge may deal with the same question. For instance, both chemistry and biology deal with the question: what is life? They differ in terms of the "tools" they use – language, terms, principles, laws, theories, investigational and observational apparatus. Moreover, over the course of time, the same discipline may deal with the same topic using different instruments and thus come up with different solutions. In this sense the background of the topic must necessarily be explicit. In fact the acceptability or non-acceptability of the question which has been formulated (and its solutions) derive from this background. This leads us directly to the debate on stimulus error, as we pointed out 10 years ago (Savardi & Bianchi, 1999, pp. 143-163).

3. *Inferential strategies* (IS). Finally, the epistemological structure of background knowledge depends on the inferential strategies adopted: deductive, inductive, statistical, exemplificative, argumentative, etc. Unfortunately, it cannot be stated that all background knowledge exclusively uses one kind of inferential strategy in order to infer the validity of proposition *q* from proposition *p*. With the same background knowledge, various strategies can be adopted depending on the individual case. It is however useful to be aware that it is also possible - if need be - to refer to this further variable, in order to define the structure of background knowledge.

This is the aspect we need to consider when identifying the inferential strategies that can or cannot be admitted to the EPHP domain: from the single-subject "pure" demonstration of the existence of the Kanizsa triangle, to demonstrations involving various steps, all entirely phenomenological (i.e. spoiling, percept-percept coupling and, in general, the "iuxta propria principia" format) and demonstrations which partially rely on psychophysical[2] or statistical inferential methods.

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[2] "The inferences involved in the interpretation of psychophysical studies of perceptual organization would make no sense without assuming the existence of a covert spontaneous organization, which under the appropriate eliciting circumstances would have led to the phenomenological report.
Psychophysical studies of perceptual organization are no more than an indirect assessment of the effects of grouping. Hence, when available, we prefer experimental phenomenology. This is not to say that tasks which have correct and incorrect responses can only serve to examine the epiphenomenality of a Gestalt

So, how do all these factors combine? Staying with the Boniolo and Vidali proposal: A scientific explanation is the reply A to a question Q, with Q = {TQ, SA, R, BK}, thus connecting the topic of the question (TQ), the set of antitheses (SA), the relationship of relevance (R) and the background knowledge (BK) – the latter, in turn, defined by its three components (BD, BT, IS).

The fact that various relevance relationships connect A and Q suggests a unitary and shared structure of scientific explanations, which at the same time, however, admits the possibility of various alternative explanations in terms of regionalized explanations: in effect if one of the levels of the factors involved is changed, a different but equally valid explanation is obtained. Thus, there is not only room for different models of scientific explanation, but also for different concepts of "explanation", depending on the scientific mindset. The three fundamental models are the nomological-deductive explanation, the statistical-inductive explanation and the teleological-functional-genetic explanation. However, when we try to extend the role of each of these individual models to that of a universal model of scientific explanation then obstacles arise.

We suggest that it is worth reading the whole of this chapter in the book by Boniolo and Vidali for a more detailed analysis of this regionalized model of scientific explanation. We believe that what we have sketched here, however, is enough to show that the EPHP can be thought of as an autonomous (regionalized) scientific domain, leaving aside the assumptions of hierarchical relationships and/or impenetrable boundaries between regionalized domains.

Falsification

Up to now we have maintained that the EPHP is first of all characterized by basic elements which are part of its genetic structure - rather than by historically, methodologically or epistemologically defined conventions - taking into account the etymology of φαίνω.

In a similar way, we will now propose that falsification is another component of phenomenological explanations and is not something that the EPHP requires due to epistemological needs. Somewhat in line with this observation are a work by Köhler (1913) and "Potential falsifiers and Gestalt Theory" by Bozzi (1985). What we are going to put forward here, however, is the view that falsification is required by the qualitative nature of facts themselves, and in particular due to the natural organization of perceptual variations into oppositional dimensions. Boniolo and Vidali,

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phenomenon. When an organizational phenomenon is subtle or complex, such tasks may give us valuable information about underlying processes. Yet we hope that we have persuaded the reader that indirect psychophysical methods do not have an intrinsic advantage over phenomenological methods. Indeed, one of our goals in this chapter was to demonstrate the power of experimental phenomenology." (Kubovy & Gepstein, 2003, p. 84)

when defining the set of antitheses, pointed out that the alternative propositions in this set are somehow obvious and often are not made explicit. In a similar way, we have noted that when we are asked to explain where a certain place is, we naturally make use of the formula "not here but there", where "here" and "there" may refer to going over versus under the bridge, turning left versus right, turning left or right versus going straight …

If one looks carefully at the classic epistemological theories which deal with falsification, despite the fact that they emphasize the epistemological nature of falsifiers, one can also find traces of the factual identity of these empirical "falsifiers". Popper, for example, when defining the decisiveness of single events for theories, explicitly states that theories cannot be deduced from individual cases but can however be rejected based on individual cases; in fact theories can clash with observed "contrary cases" (Popper, it. transl. 1978, p. 88, 150). And as example of this he refers to seeing a *black* swan when the expectation is based on the theory that "all swans are *white*". What is usually emphasized, in this example, is the epistemological asymmetry of the verificative or falsificative potentiality that the facts under observation display. On the contrary, what we would like to point out here is the identity of these "facts" under observation which the falsification/verification is founded on. As we did when explaining the right directions to the museum, when distinguishing between turning right and left, Popper distinguishes between black and white swans as critical terms for the verification/falsification of the theory.

Classic criticisms of Popper's model concerned the idea that an individual fact, which is not in accordance with the predictions of a theory, can instantaneously assume the role of "falsifier" (i. e. an *experimentum crucis*). This is, for instance, the essence of criticisms made by Kuhn (1962) and Lakatos (1976). In both these cases, this criticism has the effect of:

a) separating the identity of the falsifier into two components: the empirical or factual component (i.e. the definition of the "fact" itself) and the epistemological component (i.e. the definition of the value of that fact with respect to the theory in question);

b) introducing the term "anomalous fact" to refer to those facts whose identity contrasts, on a merely observational level, the identity expected, without making any reference to the epistemological effect that this "anomalous fact" will have on the theory, i.e. whether it will falsify the theory or simply remain an exception.

From Kuhn's perspective, the error of compressing two distinct processes into one can be avoided by recognizing that the attribution of a truth value to empirical observed facts can only occur in a second phase. Whether a fact is also a falsifier or verifier is something additional to its basic empirical identity. And in effect "anomalous facts" in same cases

remain within the scientific paradigm with respect to which they are "anomalous"; in other cases the paradigm may as a result be replaced with an alternative one. In both cases, what cannot be left out is the qualitative aspect which makes them "anomalous".

For Lakatos too this distinction between the factual and epistemological identity of counter-facts is fundamental. From his point of view, the epistemological identity can be defined only a posteriori, i.e. after the conservative or revolutionary impact of this fact has become manifest. Lakatos also explicitly refers to these facts in terms of crucial *contrary* evidence.

It is interesting that this characterization is also mentioned by Feyerabend, whose perspective in some respects is very far from the idea of factual components of potential falsifiers as used by Popper, Kuhn and Lakatos. For Feyerabend, facts are always "parts of a paradigm". In other words, there are no "facts in themselves". Even empirical data (observation data) never have an intrinsically objective truth, given that they always have to be considered as true with respect to the paradigm that they are part of. Despite this attempt to propose a rigorously relativistic system, when Feyerabend had to clarify *what* justifies the introduction of a new paradigm, he stops referring to "facts" and starts referring to "events" as a special class of facts (Feyerabend, it. transl. 1991, p. 22) making it clear that it is the evident contrast that events manifest with respect to theories which leads to the necessity for an alternative paradigm. What is interesting is that, even in Feyerabend's system where the epistemological idea of falsification has been eliminated, the recourse to the class of terms related to contrariety cannot be eliminated (e.g. event which contrast a theory, the occurrence of opposite events, contrary rules, counter-induction, contradiction between facts and experimental results…).

What this brief analysis of the philosophy of science allows us to see is precisely what becomes evident in the structure of the falsification process in the EPHP domain.

Wertheimer (1923) for instance falsifies his first law of perceptual organization (the law of proximity, which predicts the unification of the elements which are *closer* to each other, see Fig. 1) by showing that, in different conditions, unification occurs between the elements which are *farther*, but similar in color (see Fig. 2). Exactly the same kind of demonstration forms the bases for Vicario's falsification of the proximity law: here the counterexample consists of a case where unification occurs between the more *distant* elements (Fig. 3) and the demonstration is carried out without the addition of any co-varying factors (i.e. chromatic similarity, as in Wertheimer's counterexample).

Figure 1

Figure 2

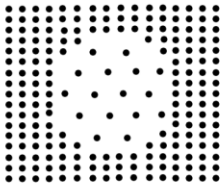

Figure 3

Similarly, if an observer in front of a swinging pendulum is asked to say if the speed is “right” and then gives a negative reply, this implies that it is moving “too fast” or “too slow” and in effect the persons adjust the speed of the pendulum accordingly.

In the same way, when observers are asked to say if the longer lines are parallel in the Zöllner illusion (Fig. 4), they respond negatively and say that in fact they diverge or converge. And if asked whether the two triangles of figure 5 are the same shade of grey, they say “no” and then explain by pointing out that the one the right is darker than the left.

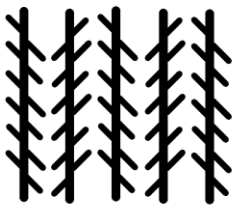

Figure 4

Figure 5

We are not saying that counter-facts are always facts which observers recognize as being self-evident opposites of the facts expected. We are however saying that the recognition of contrariety between the properties of the facts under observation is a perceptual datum (Savardi and Bianchi, 1997; Bianchi and Savardi 2008) and is it a necessary part of the falsification process (Bianchi and Savardi, 2002). If this is so, then we can go on to say that, in addition to acknowledging the factual identity of counter-facts, we also acknowledge that the rules of falsification, in the EPHP, are not methodologically prescribed by epistemological requirements, but are founded on the natural organization of the variations perceived between phenomena.

Background knowledge

In the previous sections we put forward some considerations which we believe may contribute to the establishment of the EPHP as a discipline, from the perspective of regionalized systems of knowledge.

In this final section we would like to propose some further potential "core themes" which emerged from a seminar that the authors had the pleasure of organizing and taking part in, together with Paolo Bozzi ("Veronese Lectures", 2001). These "core themes" represented the main topics of Bozzi's theoretical and experimental standpoint. They provide thought provoking suggestions for the EPHP scientific community, and it would be interesting to see if they can be agreed upon and if they can contribute towards establishing the EPHP as a regionalized discipline. [3]

1) Introspection and operationalism

Two dogmas of perceptual science state that i) the observation of what happens under the observer's eye or, in general, of what can be observed at a given moment, is always and in any case an act of introspection and thus ii) both in dealing with the stimuli and with their corresponding phenomenal experience (sensation, perception, etc.) we must comply to rigorous operational criteria.

An objection to this is that although there are no doubt some curious acts of observation that we suitably call "introspections", observation of the external world (and even of some parts of the internal world) is never characterized by introspectivity, either in everyday life or in scientific observations. Operational processes *à la* Bridgman are indispensable for defining stimuli - which in fact are simply groups of operations. When they are applied to perceptual contents, these operational processes may lead to evident misunderstandings and confusions.

2) Authentic theories on perception as opposed to theories which concentrate on what underlies perception (or is supposed to).

Scholars of perception almost always find themselves working on representations of perceptual reality and coded and accepted models of perceptual processes, with the risk of no longer being able to *see* the perceptual facts and the logic which they follow and display. Discourses on perception are full of terms which do not refer to elements that can be directly observed and which give origin to fictitious "scientific" worlds lying behind the evident contents of perception. This hermeneutical

[3] The presentation of these themes follow what Bozzi himself suggested and laid down as an introduction to the discussions. There is no written record, except for these notes, on the discussion which developed during the Veronese Lectures. Videos of these meetings will however soon be available on Internet.

device obstructs observation and hides the internal logic of the facts under observation, i.e. the foundations of an authentic theory of perception.

3) Defining what is "under observation"

Clarifying this means identifying the rules to be followed in order to avoid confusing perception with representations, memories, models and imagined ideas about perceptual facts. The definition of what is under observation involves defining the duration of the "phenomenal present" and the various kinds of "immediate memory", the permanence and transformation of the facts under observation and finally, what can be correctly considered to be the subjective counterpart of what is being experienced, i.e. the phenomenology of the subjective ingredients in a world of phenomenally independent, external objects.

4) Facts as falsifiers

The facts under observation are potential falsifiers of innumerable possible theories regarding perception. Phenomenological discoveries always falsify a theory, even if this theory has never been explicitly formulated. Models are continuously destroyed in the search for new facts, even models based on experiments and unexceptionable from the point of view of logic. In this sense, the discovery of a phenomenon is in itself part of the construction of a theory: not because it verifies something, but because it falsifies. The chain of facts that in theory connects the stimuli with what is "under observation" is made up of links which are merely sufficient rather than necessary conditions.

5) Inter-observation and the pseudo-problem of other people's perception

If we say that "no-one sees what someone else is seeing" this means that "no-one can see that no-one sees what someone else is seeing". Someone else's perception is not accessible for technical reasons and the expedients commonly used in laboratories to get over this problem are all naïve tricks to avoid what in fact is only a pseudo-problem. If we abandon these untenable ideas about someone else's perception, the act of observing together is extremely fruitful in terms of the exploration and analysis of the facts under observation.

6) The relevance of expressive qualities in the direct experience of the perceptual world

Aristotelian mechanics has its basis – in at least two cases – in the perception of the expressiveness of motion: motion along inclined planes and the trajectories of projectiles. This expressiveness also explains Galileo's wonder on discovering the isochronism of pendulum motion. All the chapters of Bozzi's "Naïve Physics" ["Fisica Ingenua", 1990]

were written in order to emphasize the importance of expressive qualities in direct perception and the essential role they play in a theory of the perceptual world (as Gibson remarked, after Wertheimer had stated it first).

7) The stimulus error

Stimulus error is, in general, the error of reification of any supposed ingredient of our discourses on perception, independently of whether this ingredient concerns physics or physiology, the logical space assumed by cognitive models or any noetic structure based on operations applied to the facts under observation.

It is evident that eliminating all this would at the same time mean that there is no possibility of considering the facts under observation as being subjective, apparent, psychical, phenomenal, while instead that they real, both in everyday life and in empirical sciences.

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