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The Perception of Contraries



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ISBN 978-88-548-1715-9

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1st edition: January 2008

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Chapter 1

Grounding contrariety in perception: the origins of this approach

Contrariety, far from being merely a linguistic or logical relationship, is inextricably bound up with how we *see* the world and act upon what we see. This is what we will be looking at and trying to prove in this book.

Before looking at the experiments we carried out to support this thesis, we would like to take you on a quick walk down the long path winding through the history of thought, which will show that the phenomenological aspects of contrariety have already been considered and conceptualized.

1.1 The very beginning

Evidence of the idea that contrariety is grounded in perception is as old as the roots of philosophical and scientific thought. The relevance of contrariety in perceptual experiences was clearly recognized by pre-socratic philosophers (Thales, Anaxagoras, Anaximander, Anaximenes, Heraclitus) where it was presented as an ontological principle for the existence of the empirical world, together with the principle of identity. Later, Aristotle, while discussing the basic role of contrariety in logic in the *Topics*, put forward (in the *Categories*) a proposal that contrariety was the key relationship in any phenomenal variation and thus vital to any empirical classification process. This latter work makes very interesting reading for psychologists who want to understand the cognitive rules of natural classification processes (as discussed in Savardi & Bianchi, 1996).

We do not intend to give an overview here of what the philosophers had to say about contrariety. Our aim as cognitive scientists is to trace references to the perceptual world and to the naïve recourse of contrariety in natural classifications of change and variation.

The fact that we can analyze ideas originating hundreds or thousands of years ago as useful observations on pre-experimental phenomenology should not arouse suspicion or cause wonder unless as Bozzi stated «one assumes that the world of direct perception (of colors, sounds, shapes, motions) has radically changed over the course of the years. The hypothesis

that our perception of the outside world might dramatically change over time and be influenced by cultural changes is, of course, tenable. This however would make it very hard to understand why, in such a maelstrom of changes, some fragments of reality remain unaltered. We should be able to explain why there are some descriptions of perception written two hundred or two thousand years ago which fit in with current perceptual experiences» (Bozzi, 1969, pp. 17 f.). The presence in ancient writings of accurate descriptions of perceptual phenomena which have since been re-described in contemporary psychology is not something new (see, for instance, Bozzi, 1990; Gregory, 2000; Pittenger, 1989; Ross, 2000; Wade, 1998).

We studied various Presocratic and Aristotelian texts and collected a series of observations about the role of contrariety and its perceptual rather than logical nature.

Presocratics: contraries as “principles”

It has been noticed (Hussey, 1972; Maddalena, 1954) that, since Thales, the search for a “principle” to explain the existence of the world has led scholars to think about contrariety. Aristotle’s observation that all those who talked about elements or principles «in one way or another identify contraries with principles» (*Phys.* A 5 188b 27–29) has been true right from the very first philosopher in ancient times. Aristotle stated that, for Thales, the earth rests on the water (*Metaph.*, A, 983 21–23) as one thing rests on another thing and is not a feature of a substance on top of that substance. It would in this way seem «reasonable to suppose that Thales was not wondering whether there is something eternal and unchangeable in the changing world, but was instead asking instead this: “what is the Cosmos, where there is hot and cold, dry and wet, light and dark, above and below?” and that his answer was that the Cosmos was the antithesis of earth and water, above and below and also, maybe, the antithesis of stability and change. If this is true, Greek Philosophy began with the formulation of a Cosmic antithesis of perceptual elements [...]. Thales [...] has left us with the issue of contrariety» (Maddalena, 1954, pp. 7–8).

This statement, expressed in a non-psychological context and without any reference to contemporary psychology, gives support to the idea that:

a) the concept of contrariety has been in existence since the beginnings of the Greek civilization and was considered more relevant than the question of invariance (i.e. whether something unchangeable would exist despite changes in the empirical world);

b) contrariety is described with respect to perceptual, not logical, contraries: dry and wet, rare and dense, above and below, stability and change;

c) in this set of contraries, the gravitational contrariety above–below was the first to be proposed.

It is also interesting to consider that the previous statements were all based on observations of perceptual phenomena. «Thales and Hippo said that the principle [which explains the existing world] is water and they were forced to this conclusion by the *sensorial analysis of phenomena*» (Simplicius, *Phys.*, 23, 21); «Thales says that the principle is water (...), getting the idea perhaps from *seeing* that the nutriment of all things is moist ...» (Aristotle, *Metaph.*, A, 983b 23–25). Hussey (1972, It. ed. p. 25, 43, 54) also emphasized that, in defining the relationship between these contraries, Presocratics did not get beyond direct observation and common perceptions. It is in fact this “limitation” that we find interesting. Many authors for instance report that Anaximander systematically based his observations on perceptual knowledge, even in the case of astronomical observations on the shape of stars and planets, thus referring to things that were not visible to him (Jaspers, 1956, It. ed. 1973, pp. 713–714, 718; Laurenti, 1971, ed. 2000, pp. 153–154; Simplicius, *Phys.*, 24, 13). In this instance he applied, by analogy, knowledge derived from everyday perception, thus going directly from what could be seen to what could be imagined.

Using this approach, Anaximander described the world as a theatre of contraries (Guthrie, 1962, pp. 78–81; Kirk & Raven, 1957, pp. 119–120; Lloyd, 1964, p. 99; Maddalena, 1963, p. 83; Martano, 1972, pp. 39 f.). These contraries are listed in fragment 9 of the Diels–Kranz collection: «Contraries are hot and cold, dry and wet and so on», i.e. again clearly perceptual contraries. They originate from a differentiation process applied to the *apeiron*, which is defined as unbounded and indefinite space. This is an interesting aspect of Anaximander’s theory since he makes it clear that contraries – to use modern terms – function as attractors in a process of differentiation from a primitive stage where no variations (thus only an indistinguishable state) existed.

In Anaximenes, once again we find this idea that the world originated from an indefinite stage (*apeiron*) resulting in contraries. The perceptual characteristics of both the *apeiron* and the process of differentiation are more explicit in this case (Laurenti, 1971). Many commentators have pointed out the spatial characterization of the *apeiron* and the fact that it is unlimited in terms of spatial extension¹. Although boundless and infinite in extension, Anaximenes’ *apeiron* was however defined in terms of qualitative aspects (DK Fr. 6, Plutarch. *Strom.* 3): it was described as indistinguishable air, «the closest to an immaterial thing» (DK Fr. 3), «foggy and misty (...) thus

¹ Heidel, 1912, p. 213; Burnet, 1952, p. 61; Gigon, 1945, p. 63; see also *Iliad*, I, 350; XXIV, 342, 545; *Odyssey*, I, 98; IV, 510; V, 46; XV, 79; XVII, 386; XVII, 418; XIX, 107.

generally identified with “fog”) (Laurenti, 1971, ed. 2000, p. 175). Besides proposing a more explicit perceptual characterization of the *apeiron*, Anaximenes also specified that contraries are created by means of a process of rarefaction and condensation (Fr. DK 5, Simplicius, *Phys.* 24, 26). Again, this clarification is based on an empirical observation, namely, the very simple observation that «men breathe hot and cold out of their mouths; for the breath is cooled as is compressed and condensed by the lips, but when the mouth is relaxed, it comes out warm because of its rarefaction.» (DK Fr. B1, Plutarch. *De primo frig.* 7, 3). Hence, by means of this perceptual experience, Anaximenes “demonstrated” that the origin of contrariety (hot–cold) is in the same indistinguishable state (air) and uses a process of rarefaction (breathing with the mouth open) or condensation (breathing with the mouth closed). Here we find yet again the close link between contrariety and perceptual experience, contrariety and the genesis of variation and contrariety and space.

What is particularly intriguing is the perceptual characterization of this indistinguishable primitive state and of the processes (i.e. contrariety) leading to the creation of variations. He proposed something very similar to the characteristics of what can be considered the simplest perceptual experience: that of a visual field illuminated by homogeneous light and perceived as a foggy indefinite space (known in contemporary literature as a Ganzfeld). We will go back to this in chapter 3 and discuss in more detail what subjects report regarding this experience.

The idea that contraries are at the base of the genetic process leading from a primitive indeterminate state to a determined state was proposed by at least three other ancient Greek philosophers.

For Heraclitus, everything that can be perceived (and nature in general) tends towards contrariety and harmony can only be obtained from contrariety. To prove this, he pointed to the harmony that originates from male/female; black/white; high–pitched tones/low tones; long notes/short notes; vowels/consonants. Heraclitus – as Jaspers (1956) noticed – was inspired by the intuition that the existence of every entity is based on opposition. This intuitive law can be directly observed: cold becomes hot and hot cold, wet becomes dry and dry wet, life becomes death, being awake transforms into sleeping, being young into being old. Pleasure also seems to derive from opposition: being ill makes one appreciate being healthy, being hungry the pleasure of being full, being tired the pleasure of being rested. In other words the genetic role of contrariety, for Heraclitus, was extended to all the contents and domains of experience, even though he did not make it clear how contraries were linked to one another or how they changed from one to the other or in what sense one could specify whether they were identical or not (Jaspers, 1956; Hussey, 1972). In some of the examples he gave, the

invariance between contraries was demonstrated when they transformed into the opposite property (as in almost all the cases mentioned above). In other cases this was based on two contraries being described with respect to the same object, e.g. «The sea is the purest and also the impurest water. Fish can drink it and it is good for them; to humans it is undrinkable and destructive» (DK Fr. 61). This is again an analysis which is based on an observation.

One can also find in Anaximenes an indication of the special relationship between space and contrariety, namely in fragment 60 (DK): «The way up and the way down are one and the same». This is significant: Heraclitus bases the origin of change and transformation in general on this spatial contrariety, thus assigning it a special role in the genesis of every variation present in the existing world. In fact, fire, water and earth (i.e. the primitive elements which the world was considered to be composed of) were said to originate from each other by means of successive processes of condensation and aggregation (“the way downward” leading from fire to earth) or, in the opposite direction, by means of processes of dissolution and evaporation (“the way upward” leading from earth to fire).

The Pythagoreans proposed a different solution to the same problem. Again contraries were proposed as having a genetic function and, given that Pythagoreans considered the entire world to be made up of combinations of numbers, a new contrariety was introduced, odd versus even.

From a methodological point of view, the starting point was once more the observation of phenomena: «since (...) they seemed to *see* in numbers more resemblances to the things that exist than in fire, earth and water (...); since they *saw* that the modifications and ratios of musical scales could be expressed in numbers; since all other things *seemed* in their essence to be modeled on numbers and numbers *seemed* to be fundamental to the whole of nature, they supposed that the elements of numbers were the elements of all things» (Aristotle, *Metaph.*, A, 5 985b 23; DK Fr. 58). Numbers were thought of as geometric shapes not as abstract entities and the distinction between odd and even was itself founded on spatial characteristics. As further proof of this, the contraries odd–even are presented as part of a list of nine other pairs of perceptual contraries: limited and unlimited, odd and even, one and many, left and right, male and female, still and moving, straight and curved, light and dark, good and bad, square and oblong (Aristotle, *Metaph.*, A, 5 985b 22). Without going into details, what we want to emphasize here is that contrariety between numbers was fundamental to the empirical world and was considered to be the key principle to explain the genesis of empirically experienced variations between sounds, shapes, colors, quantity and quality.

As numbers had perceptual qualities for the Pythagoreans, atoms had perceptual qualities for the ancient atomists, Leucippus, Democritus,

Epicurus and Lucretius. Here again, the idea was that different characteristics reflected differences in the shape of the elements composing them. Qualitative traits (e.g. taste and smell, but to a greater or lesser extent any kind of sensory information) were seen as the result of actions performed by atoms on the organism (made up itself of atoms). The differences between perceptible qualities were reduced to the geometric forms of atoms and atom aggregates, classified according to their structure and position in space.

If we look at the kinds of differences imagined and described (both at macroscopic and microscopic levels), we again find contrary properties. Consider for instance the case of taste. Ancient atomists assigned a precise atomic shape to each flavor (Theophr, *De Caus Plant.* VI 1, 6): the perception of sweetness was caused by quite large, rounded, smooth atoms; that of sourness by large angular, rough, multi-faceted atoms; that of acidity by narrow, hooked, angular, sharp atoms; that of bitterness by small, rounded, uniformly curved ones. Water was thought to be made up of very small, light rounded elements which could move very fast; while honey was made up of large, slow, quite heavy atoms. Interestingly, a research conducted by Bozzi in 1999 within the field of contemporary psychology demonstrated striking similarities between the shape and qualitative features of the atoms imagined and described in the texts of atomists and the characteristics described by naïve subjects as corresponding to the perception of certain flavors (see also Bozzi, 1999).

Aristotle: the natural classification of “things”

When the word “opposites” is linked to the name of Aristotle, it’s likely that the first thing to come to mind is Aristotelian logic, in particular what in the middle ages was known as the Aristotelian square of opposites. In point of fact, Aristotle dealt with contraries in a much wider and more extended way. There existed an entire tract on contraries which was then lost, and contrariety played a basic role in the “Categories”, where Aristotle presented what can be considered the first attempt at classification of empirical reality in western scientific tradition. This classification was made by taking into account the perceptual qualities of the world and for this reason we consider it to be intriguing for cognitive scientists interested in understanding natural classification processes (see Savardi & Bianchi, 1996; 1997, pp. 141–164).

Aristotle based his classification mostly on the *directly perceived identity* of things, i.e. on self-evident features. He also took into account the relationships that natural languages suggest when naming things with identical, similar or different terms. However, he limited his use of these to when linguistic relationships *reflected the invariances and variations that*

could be observed. These perceptual aspects were precisely what the classification needed to be based on. To give an example, in the case of homonymy (e.g. “match” is either an organized sport game or a small wooden stick with a substance on one end that produces a flame when you strike it against a rough surface) two things have the same name (invariance), but this does not reflect the fact that they have different identities. This kind of “false invariance” (and inversely “false differences” such as when different labels are given to things that in fact belong to the same genus, e.g. glasses and spectacles) were the kind of classification errors that Aristotle would have wanted to avoid.

From a methodological point of view, he did not use logical demonstrations to explain why things were in the same or different classes, but rather gave *examples* as self-evident proof (i.e. he used direct recognition of the characteristics which the classification was based on).

His process of classification was entirely bottom-up: it started from *perceptual data* (everyday things) that he considered to be the *basic data* for human knowledge. He then progressively built on top of this until he reached the final group of ten categories (substance, quantity, quality, relation, place, time, position, state, action and affection). Throughout the text we read that these final categories refer to aspects that can be observed and experienced at the bottom of the classification when actually looking at an object.

If one considers the criteria used by Aristotle when he was deciding whether to include something in one class or another or to create a different class, one discovers that these criteria were explicitly concerned with the identification of *common* and *distinctive features* – to use the terms of Tversky’s (1977) model. For Aristotle, in order to define an object, one needs to identify genus and species (*Metaph.*, VII, 1037b 28), that is to say, the features of the object that are common (invariant) to all the individual objects belonging to the same genus and the features which distinguish it from the other objects belonging to the same genus (but to different species). Elsewhere he emphasizes the role of *distinctive* features, saying that «definition is the formula which comprises the differentiae» (*Metaph.*, VII, 1038a 7) and that «the genus absolutely does not exist apart from the species of a genus (...); its differentiae make the species» (*Metaph.*, VII, 1038a 18) and that when we go deeper into the definition of reality it is necessary for the division to be «by the differentia of the differentia (...) and the process always wants to go on till it reaches the species with no differences» (*Metaph.*, VII, 1038a 10).

The Aristotelian system of classification, as may be noticed even in this brief presentation, is not very different from the *feature based* methods of classification developed more than two thousand years later in experimental Psychology (e.g. Jolicoeur, Gluck & Kosslyn, 1984; Rosch, 1975; Rosch &

Mervis, 1975). What is still fresh in Aristotle's system and particularly relevant for our discourse is his way of dealing with variations (or *distinctive features*). He proposed that every change is between contraries (*Cat.* 5, 4a 30; 10 12b 19–21) and indeed he brought every kind of non-identity present at any level of taxonomy back to contrariety. He explicitly distinguished between different species within the same genus basing this distinction on contrariety (*Metaph.*, Z, 12 1037b 20). Even when referring to small variations perceived between similar things and the variations perceived between completely different things, he again referred to contrariety. To understand this, we need to consider his definition of contrariety. He spoke in terms of “maximum difference” (*Metaph.*, D, 10 1018a 27–28; *Cat.* 6, 6a 17–18; *Metaph.* I, 4 1055 a 27–28; *Post. An.* I, 4 73b 21–22), where “maximum” refers to the extreme degree or intensity of the variation and “difference” means a special kind of variation. He considered “difference” to be separate from “diversity” based on the number of characteristics which co-vary and thus distinguish two objects. For diversity, and for things which can be regarded as being diverse from each other, there is no need for there to be any aspect in common. The concept of difference, conversely, implies that two things differ with regard to some aspects, but otherwise necessarily have many aspects in common (see *Metaph.*, I, 3 1054b 23–26). Using language more familiar to cognitive scientists, we could translate this distinction between difference and diversity in terms of unidimensional *versus* multidimensional variation. By considering contrariety as the maximum variation within a dimension (maximum difference) and defining diversity in terms of the sum of differences (i.e. the sum of contrarieties in many dimensions), we see that contrariety forms the basis of both diversity and difference. Moreover, by looking at intermediates in terms of contrariety (*Metaph.*, I, 7), even minor variations from a particular quality are still contrariety. To cut a long story short, the most interesting feature of Aristotle's system is that contrariety might be thought of as the basic relationship on which natural recognition of any kind of variation (minimum, maximum, or multidimensional) is grounded.

Having observed the link between contrariety and the empirical experience of variations according to Aristotle, we might now ask if there is any trace here of the genesis of contrariety in spatial properties. In *Categories* (6a, 10–20), it is briefly stated that people «define “above” as the contrary of “below” and it seems that in defining contraries of every kind, people have recourse to a spatial metaphor, for they say that those things are contraries which, within the same class, are separated by the greatest possible distance». Aristotle does not support this statement further and in effect his commentators have not paid any attention to this aspect. It is however interesting if we consider this with reference to our hypothesis that

the perception of contrariety is pervasively and primarily linked to the phenomenological geometry of space. We do not know for sure if the origin of Aristotle's statement was merely Thales' prior concept of contrariety, based on above–below, or if he based it on his own cosmological model. The second would seem more likely. However one might also wonder if it, at least in part, reflected a perceptual intuition, supported by the many interesting observations he developed in *On the Heavens* (II, 2) regarding the role of gravitational, sagittal and coronal orientation in the identity of an object.

1.2 From Philosophy to Experimental Psychology: the perceptual theory of relationships in Psychology

The study of relationships in terms of direct experience filtered into Experimental Psychology from Philosophy with the advent of Gestalt Psychology. There is an interesting path which leads from Aristotle to Brentano (see Antonelli, 2003; Runggaldier, 1989; Smith, 1988) and which thus bridges the gap between Aristotle's way of thinking and phenomenological Psychology which developed in the late 19th century. We are not going to reconstruct this bridge here. What we are going to briefly look at is, specifically, the link between the ways of dealing with relationships as direct data of experience that were discovered in the phenomenological aspects of Presocratic and Aristotelian theories and the ways in which this idea has influenced Experimental Psychology.

The affirmation that relationships are directly perceived was indeed one of the fundamental reasons for the contrast between the two theories leading to the origin of Experimental Psychology. Atomistic theories (Helmholtz, 1911; Titchener, 1898; Wundt, 1896) acknowledged direct perception only of sensory elements and the construction of relationships was considered to derive indirectly from combinations of these sensory elements. In contrast, the phenomenological school – from Meinong (1882) and Ehrenfels (1890) to Koffka (1922, 1935), Köhler (1929, 1938) and Wertheimer (1913, 1923) – postulated the direct perception of *relationships*. This is demonstrated in their definition of Gestalt qualities (Ehrenfels, 1890). Gestalt qualities represented properties arising from the global structure of an event. In Ehrenfels' classic example (but also found earlier in Mach, 1886), melody can be considered a Gestalt quality: its identity is not in individual notes, nor in their mere sum, but in the relationship between them. Hence we can change all the different components of a melody in turn one by one and still *perceive the same tune*, or we can maintain exactly the same elements (the same notes), modify their sequence and obtain two *entirely different tunes* as

a result. What matters therefore is the relationship of the notes to each other (e.g., sameness, rising or falling pitch, etc.). Melody is a Gestalt quality founded upon the relationships perceived between its components.

Two types of immediately perceived relationships come into play when we consider the definition of Gestalt qualities: a) the *relationship between part-whole*; b) the *identity, similarity or diversity* between parts (e.g. notes) and between wholes (e.g. melodies).

The role of the second type of relationship was considered just as decisive in the organization of our perceptual world as the former, even though it is the part-whole relationship that is usually cited as the main idea developed by Gestalt theory. For instance, it is rarely mentioned that when Ehrenfels wrote his famous article on *Gestalt qualities* in 1890 (the article in which the example of melody was proposed), he also dealt at length with the second type of relationship. In particular, he said he agreed with Meinong's (1882) dissertation on Similarity, Equality, Identity, and Causality, while – and this is interesting – he contested Meinong's analysis of “Contrariety”. So what did he think was wrong with it?

From Meinong to Ehrenfels: the narrow view on contrariety

The concept of “contrariety” (why it is in inverted commas will become clear in a moment) was present among the set of relationships discussed by Meinong (1882, sect. 5). However, he did not treat it as a relationship emerging from a *comparison between two* qualities or objects, as was the case for sameness, similarity, diversity and causality. In the examples he suggested (the relationship between round and square or between a round table and a square box or an object that was round and then changed its form into a square) we can perceive a well-defined relationship. Round and square are perceptual data and thus they can be compared. However, the result of this comparison is, in Meinong's terms, the recognition of a generic diversity and not specifically of what we would call “contrariety”. He limited the definition of “contrariety” to the specific condition of *co-presence* of two contrary attributes in the same place at the same time. «The round table is perfectly compatible with the square box (...) Their incompatibility depends on a certain condition, namely the condition (...) that they be conceived of as belonging to the same place and time (1882, Engl. trans. 1974, p. 27)». To be consistent with this constraint, Meinong used the term “incompatibility” rather than “contrariety” or “opposition”.

There were two things which distinguished this relationship from others. First, the procedure leading to its recognition: for similarity and diversity, the procedure consists of comparison, which – Meinong specified – is based necessarily on experience, similarity and diversity being “explainable only

through examples” (cit. p. 137); on the contrary, judging whether things can or cannot be co-present is a process in which «what is decisive is not “the experience” or “the experiment”, but the nature of the representational contents themselves» (cit. p. 137). Second, the nature of the contents should also be different. As a result of comparisons, a new representational datum is generated or, in Ehrenfels’ words, a gestalt quality. This is not the case with incompatibility, as incompatibility can only be “thought of” and no “new perceptual datum” emerges.

By pushing the definition of incompatibility further in this direction, Meinong arrived at syllogisms, the deductive process and the Principle of Non-Contradiction. It will not escape the reader’s notice, nor did it escape Meinong himself, that he was no longer dealing with empirically defined structures, but with logic. He revealed that he felt uncomfortable with this non-experiential definition of incompatibility and he apparently felt the need to justify why he had been forced to adopt a “purely conceptual” type of incompatibility. He used two arguments to prove that it was impossible to define incompatibility on an empirical level. Firstly, one cannot simply reduce compatibility to the actual *experience of the co-existence* of two attributes and incompatibility to establishing that the two attributes *have never been found together*. The inadequacy of this definition can be demonstrated any time we encounter something we have never seen before. Just because we have never experienced this particular juxtaposition before doesn’t mean that it is not possible. Secondly, the idea of considering “incompatibility” in terms of the inconceivable or unimaginable and “compatibility”, conversely, in terms of the imaginable did not lead to better results. In this case, incompatibility would be seen as a failure to intuitively represent certain attributes together. Yet this difficulty can also be encountered with attributes that are not incompatible, but which are simply hard to imagine. For instance, it is intuitively impossible to represent in one’s mind a hundred things together, even if they are miniscule (Meinong, Engl. trans. 1974, p.152), but this does not imply any kind of incompatibility.

If we cannot define incompatibility empirically, we can only collocate its definition on another level, something which Meinong did, in fact, by assuming the need for a separate class of relationships.

This conclusion was what Ehrenfels disagreed with and re-discussed in his paper, where “incompatibility” was presented as a “*phenomenon* of the highest importance which can be understood as a *Gestalt quality*” (1890, Engl. trans. 1988, p.102). Ehrenfels wrote: «if one now attempts to bring to the state of executed combination an empty intention of incompatible determinations such as *round* and *square*, as was done before with compatible characteristics (such as, say, *having eight points*, *star-shaped*,

made of white marble on a black base, etc.), then the process thereby set in motion is initially fully analogous to this earlier case, until suddenly there comes into play a certain moment, not more precisely describable, in which (speaking metaphorically) the determinations resist becoming unified, as if one were to try to force two bodies into a container that had been constructed to take only one of them. And whilst in the earlier case the intuitive presentation came into being with a precision comparable to the insertion of a spring–lock in its housing, the formation–process now falters at the half–way point in an unmistakable way – not precisely characterizable by means of comparisons – which we call “*incompatibility*”. Thus we conceive incompatibility as a peculiar type of presentational element, as a temporal Gestalt quality» (Eng. trans., 1988, p. 103–104).

Thus Ehrenfels attempted to reintegrate “incompatibility” into the class of Gestalt qualities. However, in our opinion this did not take him as far as he should have gone in assuming a phenomenological perspective. Like Meinong, Ehrenfels remained limited to a narrow vision of opposition: they were both examining it through the keyhole of the principle of non–contradiction, although they redefined it in the psychological guise of the experience of impossibility. They failed to examine the other ways in which contrariety yields itself perceptually. As this book will demonstrate, a vast panorama involving comparison between objects, between parts of objects and between properties of the same or various objects was thus left aside, waiting in the wings. In other words, the constriction of being bound to the form of “coexistence in the same time and place” remained a limitation, we believe, for both original Gestalt dissertations on opposition. This is also perhaps one reason why the study of opposition then foundered in ensuing experimental analyses.

The formula of *coexistence in the same time and place* that was proposed by Meinong and Ehrenfels, other than proposing a “narrow view” of contrariety, does not help the psychologist of perception to understand whether the incompatibility of certain properties is a rule of perceptual organization. We may indeed ask what exactly is this “same place and time” which the formula refers to. An observed event has its own size and duration; it has its own parts–whole relationship (Bozzi, 1989; but see also Gibson, 1979 and his definition of the unit of measure of the ecological environment) and cannot be magnified or shrunk according to logical requirements. Thus, when we say that round and square cannot be qualities that are present in the same place at the same time, what are we really referring to? Where exactly is this “place”? Does it refer to the object as a whole or to part of the object? What if the object is a table? It has opposite properties: it has a top and a bottom; it is narrow and wide. So does the “place” refer to something smaller, i.e. the individual parts of an object? Can

two opposite properties therefore not coexist in the same individual part? However, we can certainly find straight and curved or round and angular features in a table leg. Should we therefore consider something even smaller such as a square centimeter of the table leg? Yet in that square centimeter, I can still find the properties of full and empty in the not uncommon case of woodworm. Do we have to reach an even more microscopic level and say that the “place” actually refers to the smallest visible unit...let’s say a quarter of a square millimeter? Yet this is hardly the unit that Meinong and Ehrenfels had in mind, since their theory of perception was in contrast to this type of atomism, i.e., to definitions of atomistic units finding no correspondence in direct experience.

The second problem with the Meinong–Ehrenfels view is that if we consider two qualities as compatible (let’s say yellow and rounded), why can’t rounded and angular be compatible too? Furthermore, there are many different types of experiences which demonstrate the cohabitation of contrary features. For example, the experience of sweating due to high fever with the simultaneous sensations of heat and cold; dark chocolate, which is both sweet and bitter; the acoustic experience of silence encompassing noise (e.g. when we are alone in a room, with no external voices or noises, but with the muffled background droning of a fan); observing our own image in the mirror (another interesting example of the simultaneous coexistence of an experience of identity and contrariety, covered in greater detail in Chapter 6); hysterical laughter, which embraces laughing and crying at the same time; a manly woman or an effeminate man; something ugly, yet fascinating; feeling ill in some part of your body while the rest is healthy and finally all experiences included in the class of oxymorons referring to sensorial experience such as “an ice burn”, “a deafening silence”, etc.; and these are just a few examples.

Notes on the Wundtian perspective: a broader view

Although it may seem paradoxical in terms of the theoretical background of this book (i.e. a phenomenological approach to perception), it must be noted that from the beginning there was a broader perspective on contrariety in the other original branch of experimental psychology: Wundtian Psychology.

In his *Outlines of Psychology* (1896/1897), Wundt presented the law of psychical contrasts (together with the law of psychical resultants and the law of psychical relationships) as one of the three general psychological laws of relationships. *The law of psychical contrasts* referred primarily to feelings. Wundt in fact thought that feelings could be divided into contraries (pleasurable and unpleasurable, exciting and depressing, straining and

relaxed) and that as they change, these contents obey a law of intensification through contrast. However, by “feelings” he meant, in general, the subjective contents of sensation or what we might call the phenomenal counterpart of experience (cit., 1897, p. 30) and so he extended the law of contrast to include contrary colors (cit., p. 45, pp. 52–53), tones, rhythms, sizes, smells and tastes (cit., pp. 66–69).

By linking the law of contrast to the contents of a person’s experience, Wundt *de facto* extended it to all experiences: perceptions, cognitive representations and emotions. He considered this contrast to be both a relationship of comparison and the result of the *immediate experience* generated by the comparison – more or less how a melody is generated from musical notes. He did not make any distinction between the status of contrariety and that of other relationships such as sameness, similarity and difference. Of course, one must keep in mind that Wundt did not use the term “immediate” in the same way as Ehrenfels, Meinong and the Gestalt psychologists did. However the applicability of the law of contrast to different domains and the acknowledgement of it as a basic law which naturally organizes the direction in which qualities change (the law of intensification through contrast; the law of development towards contraries) are two relevant features of the Wundtian perspective. Paradoxically, in contrast to the observations by Meinong and Ehrenfels on incompatibility, they are also central to the phenomenological perspective of contrariety we are presenting in this book and whose roots can be found in the Presocratic and Aristotelian phenomenological observations mentioned at the beginning of this chapter.