Forum: The Philosophy of Classification

The Concept of Concept: Concepts and Terms†

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ABSTRACT: The concept of concept has seldom been examined in its entirety, and the term very seldom defined. The rigidity, or lack thereof, and the homogeneity, or lack thereof, of concepts, are only two of their characteristics that have been debated. These issues are reviewed in this paper, namely: 1) does a concept represent its referent(s), or is it a free creation of the mind?; 2) can a concept be analyzed in parts or elements?; 3) must a concept be general, i.e., refer to a category or a type, or can it refer to a single object, physical or mental?; 4) are concepts as clearly delimited as terms are? Are concepts voiceless terms?; and, 5) what do terms contribute to an individual's and a community's conceptual richness? As regards the relationship of concepts with their referents in the stage of formation, it seems reasonable to conclude that said relationship may be close in some concepts, less close in others, and lacking altogether in some cases. The set of elements of a concept, which varies from individual to individual and across time inside the same individual, is called the intension of a concept. The set of referents of a concept is called the extension of that concept. Most concepts don't have a clearly delimited extension: their referents form a fuzzy set. The aspects of a concept's intension form a scale of generality. A concept is not equal to the term that describes it; rather, many terms are joined to concepts. Language, therefore, renders a gamut of services to the development, consolidation, and communication of conceptual richness.

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1.0 Introduction

As has been remarked by Stephen Toulmin, the concept of concept has seldom been examined in its entirety, and the term 'concept' very seldom defined (1972, I, 8).

One exception is the Italian political scientist Giovanni Sartori, who states that "concepts are the fundamental units of thought" (1984, 27).[1] Ernest Gellner underpins that such units are not ultimate, in that they can be subdivided (1964, 120), and Hans Selye adds that, besides being "far from rigid," they are "far from homogeneous" (1964, 268).

The rigidity, or lack thereof, and the homogeneity, or lack thereof, of concepts, are only two of their characteristics that have been debated.

Some of these issues are reviewed in this paper, namely:

- Does a concept represent its referent(s), or is it a free creation of the mind?
- Can a concept be analyzed in parts or elements?
- Must a concept be general, i.e., refer to a category or a type, or can it refer to a single object, physical or mental?
- Are concepts as clearly delimited as terms are? Are concepts voiceless terms?
- What do terms contribute to an individual's and a community's conceptual richness?

A section will be devoted to each of these issues.

1.1 Copies or creations?

The first question is whether, and to what extent, concepts represent their referent rather than being free creations of the mind.

Let's start from Aristotle's well-known maxim in *Second Analytics* (*nihil in intellectu quod prius non fuerit in sensu*: there is nothing in the intellect but what has formerly been in the senses). In the Middle-Age *scholae* (schools), it was generally taught that ideas are but mirror images of things. John Locke openly criticized that position, maintaining that our ideas result from a process of abstraction in which only the relevant elements are retained (1690, IV, 20). This moderately empiricist stance is shared by John Stuart Mill: "The concept is not built from the mind out of its own materials [but rather] is obtained by abstraction from facts […] It is not supplied *by* the mind if it has not been supplied *to* the mind" (1843, III.II.4 and IV.II.3. Our italics). Similar statements can be found in Mach (1905): concepts represent and symbolize large classes of facts; and in Ryle (1945): concepts stem from the abstraction of elements common to a number of observations. In fact, this is exactly the procedure by which Aristotle distinguishes features characterising substance (*ousia*) as opposed to accidental ones (*sunbebekon*) in the objects he observes.

Aristotle's maxim (see above) is qualified by Leibniz (1703), who adds *nisi intellectus ipse*—but for the intellect itself.

Hume (1748) reinforces the Scholastic position, maintaining that all our ideas are nothing but copies of our sense impressions: this is an extremity of the *continuum* we are examining.

On the other hand, many authors underline that men's minds are not passive receptors; they collect and group into categories what otherwise would be lost in the chaotic multiplicity of experience. In so doing, the mind selects some elements from a flow of experiences of fathomless depth and extension (Weber 1904; Brunswik 1956; Church 1961; McKinney 1966; Phillips 1966, sec. 2.3; Schutz 1970, sec. 2). Elaborating on Locke's stance (see above), Kant (1781) had already stated that the elements selected for abstraction are not common in themselves, but are made common by the mind itself in its activity. This act of selection renders concepts into something quite different from a "mere reminder," a stenographic transcription of reality (Dewey 1938/1974, 329; Piaget 1937; 1964; Weimer 1975; Crespi 1985, sec. 7.1).

Some would go so far as to affirm that concepts are "free creations of the human intellect;"[2] their essential nature consists in transcending the level of perceptions (Blumer 1931, 518-9). "Not only do we assemble specific facts; we add elements previously inexistent in any of the facts observed […] a creation of the mind aimed at introducing order in the apparent chaos of facts" (Whewell 1840, XI.V.I sec. 2). A well-known instance is Goffman's concept of total institutions, formed after considering specific characteristics of the organization he was studying—a mental hospital—and finding them common to other institutions such as monasteries, prisons, and so on (1961).

Moreover, "concepts like super-ego, libido, cultural delay, and development are more constructions than abstractions; even if we do consider them abstractions, they have lost any clear referent" (Bruschi 1990, 150); "concepts such as function, structure, equilibrium, isomorphism have no referents" (Sartori 1979, 58).

In psychology, and, at times also in the social sciences, concepts having no tangible referents are called 'constructs.' According to a methodological manual of behaviouristic inclinations (Selltiz et al. 1959, 41), the term reflects the fact that constructs are construed on concepts at a "lower level of abstraction." Other authors state that constructs are "deliberate creations" (Cronbach 1971, 462); "invented rather than inferred" from their referents (Bunge 1967, II, 190); or that they have "systemic meaning" (Kaplan 1964, 58).

Regarding the relationship of concepts with their referents in the stage of formation, it seems reasonable to conclude that said relationship may be close in some concepts, less close in others, and lacking altogether in some cases. Furthermore, it seems that most participants in that debate have paid little attention[3] to the fact that—once formed—concepts facilitate the framing of other situations, objects, and feelings, thereby reducing the complexity and the critical na-

ture of what has been experienced—a process that Schutz (1945) called 'typification.'

2.0 Concepts: the intension

A second issue is whether concepts can be analyzed in parts or elements. On this point, authors are in agreement: concepts are units of thought, but such units—not unlike atoms—are by no means indivisible.

Within any concept, elements, or parts—being concepts in their turn—can be identified. As will be argued later, the set of these elements varies from individual to individual and across time inside the same individual. This set (varying and indefinite) is called the intension of a concept.

For instance, the intension of the concept that, in English, is normally designated with the term 'cat' usually entails elements such as having four legs, mewing, being independent from its (eventual) master, and so on. Less common elements are the genetic relationship with lions, tigers, lynxes; the fact that, when the cat is in tension, its tail stiffens; etc. Even less common elements are the peculiarities of a cat's digestive system or reproductive apparatus, which enable zoologists to distinguish cats from other felines.[4]

The set of referents of a concept is called the extension of that concept.

Some authors[5] attribute the idea of a conceptual pair intension/extension to Leibniz (1703, IV), Mill (1843) or even Carnap (1928). Yet, already in the *Logique* of Port Royal, the following statement can be found (Arnauld and Nicole 1662, I.6):

> In the universal ideas it is important to distinguish between the comprehension and the extension. We call comprehension the attributes that an idea includes and that cannot be removed without destroying it. We call extension the objects to which said idea can be applied: thus the idea of triangle applies to all different triangles.

Also, Locke (1690, IX) precedes Leibniz in formulating at least the concept of intension when he states that some people, when thinking of gold, only consider weight and colour; others think of ductility, still others of fusion, or of solubility in acid.

As for the terms 'intension' and 'extension,' it is often stated that they were introduced by Carnap (1928); but we have seen that the authors of *Logique* used 'extension,' and, in a classical treaty by Jevons, we can read: "The objects denoted form the *extent* of meaning of the term; the qualities implied form the *intent* of meaning" (1874, 26. italics ours).

By Jevons, as well as by Carnap, intension and extension are attributed to terms rather than to concepts; this is still the prevalent use (Cohen and Nagel 1934, 31ss.; Dewey 1938/1974, 445-53; Salmon 1964, 91; Bianca 1984, 139). In my opinion, it is proper to say that a term has one or more meanings, i.e., designates one or more concepts, each of them having an intension and an extension. On the other hand, for practical reasons, we can talk of the intension and the extension of a term, as Sartori (1984) has suggested.

In the mental process often called "association of ideas," we link terms designating concepts that sometimes seem to have little in common. This is because our mind, with a rapid and hardly conscious process, has linked one or more aspects of the intension of the former concept with one or more aspects of the intension of the latter. Francis Galton (1883) was one of the first to ask whether such associations "are common and intersubjective or [whether] they are highly specific of each individual" (Violi 1997, 130). It is well-known that word associations were used by Jung (1904-09) and his school to diagnose various forms of mental illness. Shortly afterwards, Woodrow and Lowell (1916) compared the frequencies of 9 types of associations (cause/effect, part/whole, species/genus etc.) in adults and children. The studies collected by Postman and Keppel (1970) confirm previous findings as to the paucity of inter-individual variations. As it often happens, studies of infants and aphasic patients have supplied precious information on the working of the human brain in this field too (Jakobson 1941; Warrington 1981).

Giovanni Sartori appropriately states that "a concept is its intension," i.e., the set of its aspects, but he distinguishes between defining and contingent aspects (1984, 32-40). This distinction echoes the linguists' distinction between semantic markers of a term—setting the place of that term inside a language's general structure—and distinguishers (Katz and Fodor 1963). Indeed, several equivalent conceptual pairs have been proposed; Bierwisch and Kiefer (1970) distinguish between core aspects of the intension (which they define as Katz and Fodor) and peripheral aspects. In a similar vein, Osherson and Smith (1981) distinguish the core of a concept and the aspects through which examples of its extension are identified; in their favourite example, sexual characters are the core of the concept of "woman," while the hair's length, clothes, type of voice, etc., are the identifying aspects (also see Lakoff 1987).

Yet, with his well-known example of a tiger with only three legs that nevertheless is identified by one and all as a tiger, Paul Ziff (1960) had already shown the fragility of any dividing line inside the set of aspects forming the intension of a concept. Nobody would deny that having four legs is a defining, or core, aspect of the concept of tiger; however, in practice, it does not work as a line of demarcation.

In our opinion, the intellectual operation of identifying a real-life referent as belonging to a class is not governed by the dichotomous (yes-or-no) canons of scholastic classification.[6] Rather, it consists of a subtle and complex balancing of requisites which are owned by the referent and requisites which are not—an operation performed rapidly hundreds of times during the day thanks to our tacit knowledge. Eleanor Rosch (1978) and her school have maintained that the identification of real-life referents as tokens of a given type is driven by the comparisons of the referent with the appropriate prototype (the typical bird, the typical postman, etc.).[7] As a matter of fact, in assigning an object to a type, artificial neural networks seem to consider its global resemblance to a prototype rather than following the classical canons of classification (Parisi 1989, 52).

As is well-known, Wittgenstein spoke of a family resemblance: an object is identified as a referent of a concept even if it only owns some of the family's requisites. His favourite example is the concept of game: there is no game more typical than any other; even less a core of required aspects of the intension of the concept of game. Rather, a sort of chain, or circle, where every member shares some requisites with the next ones. Violi (1997, 197-8) has convincingly shown that few concepts (one example is *fresh*) are better treated by the family-resemblance approach. The majority are better suited by prototype theory. She concludes (1997, 217-19) that, barring a few requisites that she calls 'essential'—such as being a human for a bachelor, or being a feline for a cat—most requisites can only be called 'typical,' insofar as they only allow probabilistic inferences (in Ziff's example: if it is a tiger, it will very probably have four legs). However, even essentiality can be a matter of cultural definition, and therefore negotiation (Violi 1997, 222-3); we consider the whale mammalian because, in zoologists' taxonomies, the mode of hatching and nourishing the brood has been given priority over other criteria (e.g., the type of environment where a species lives).

The set of referents of a given concept is called its 'extension.' The extension is always related to a given spatio-temporal milieu, that can be the entire earth today, or the entire universe with no time limits (in the latter case, we talk of "universal" concepts). From Plato through the Middle-Age scholae until Francis Bacon and Locke, the reflection on a concept's intension had a clear priority. Even in modern times, many take for granted that "by fixing the intension we also fix the extension" (e.g., Bruschi 1993, 66). However, this is true only in theory; as we have just seen, real life presents a number of cases whose appurtenance to a given set of referents may be questioned. Therefore, even if the spatial-temporal milieu of a concept were precisely defined—which in fact very seldom happens—most concepts don't have a clearly delimited extension: their referents form a fuzzy set.

3.0 Do concepts have to be general?

The third issue I intend to consider is whether concepts have to be general—i.e., must refer to a type—or can they also refer to a single object, physical or not. Classical Greek philosophers (from Socrates to Epicurus through Plato and Aristotle) share the idea that concepts (or terms—the distinction is seldom made) are formed by abstracting from a certain number of particular instances. It is well-known that the strongest and longest-debated issue in Middle Age philosophy is the so called "problem of universals" (debating the ontological nature of such concepts), which is associated, although not strictly coincident, with the issue debated here. For the "realist" faction, general concepts are real, i.e., have real referents. For the opposite "nominalist" faction, universal concepts only exist in thought; in reality, only single referents exist. Philosophers supporting the latter position were often charged with heresy—not a trivial matter in those times—in that, through nominalism, the ontological nature of the Holy Trinity might be put into question. For centuries, nominalists had to defend themselves in councils, often escaping and looking for the protection of emperors or feudal lords fighting against the church for entirely different reasons.

Realists owed their view to Plato's conception of an immaterial world, inhabited by motionless and timeless ideas, imperfectly reflected in the perceivable world. Most Neo-Platonists were realists; central figures in this orientation were John Scotus Erigena (IX century), Anselm of Aosta/Canterbury (XI century), Bernard de Chartres[8] (XII century), Robert Grosseteste (XIII century), and Hervé Nédellec and John Wycliffe (XIV century). A radical version of realism was advocated by Guillaume de Champeax and Gil-

bert of Poitiers, both born in 1070, and Gauthier Burley at the beginning of the XIV century.

A clearly nominalist position dates back to the stoics—in particular Chrysippos—who distinguished between reality (το τυγχανον, what happens), meanings (το λεκτον, what has to be said) and signs (το σημαινον). In *Cratylus*, one of Plato's dialogues, Antisthenes is reported challenging Socrates: "A horse I can see, but horse-hood I cannot see." Some nominalist stances can be reconstructed in fragments by authors as distant as Gorgías and Epicurus.

In the late XI century, this position was resumed with force by Roscellin de Compiègne, who states that general concepts are but vocal utterances (*flatus vocis*). His *sententia vocum* (doctrine of the voices) is adopted by Pierre Abelard, a former pupil of Champeaux, who attempts to reconcile the opposing positions. An intermediate position is also formulated, in the XIII century, by Albertus Magnus, his pupil Thomas Aquinas, and John Duns Scotus. But a pupil of the latter, William of Ockham, turns out to be the most explicit—and best known—promoter of the nominalist view. Concepts lacking individual referents are mercilessly cut off by his razor, given that *entia non sunt multiplicanda praeter necessitatem* (entities should not needlessly be multiplied). This outright nominalist position is transmitted to Ockham's pupil Jean Buridan and the latter's contemporary and countryman Nicholas of Autrecourt.

With the waning of theological debates toward the end of the Middle Age, the *quérelle* loses momentum—however Philipp Melanchthon[9] (1528), the philologist who helped Luther translate the Bible into German and settled Luther's doctrines on a solid basis after his death, adopted a strong nominalist stance in his early works.

The three leading figures of modern British empiricism uniformly maintain that the supposedly general concepts are but concepts with particular referents assumed as symbols of other similar specific referents (Locke 1690, Berkeley 1710, Hume 1739-40, I.I.7). On the contrary, Kant states that concepts, by their very form, are universal (1783). John Stuart Mill resumes the classic Greek position as he states that "concepts are formed by abstraction from individual objects" (1843, I.II.5 and IV.I), and similar formulae are repeated by Mach (1905), by Wundt (1896) and his pupil Grünbaum (1908), and by Husserl (1913). Behaviourists, as well, are convinced that concepts are formed by abstracting common elements in referents (in their language, a concept is but a common response to a set of similar elements: Kendler 1961, 447); this idea inspires a long lasting research tradition (Hull 1920; Smoke 1932; Heidbreder 1947).

Criticizing Husserl, Schutz (1954) maintains that only by experiencing various specific referents do men form general concepts; bestowing universal nature on such earthly constructions is a delusion. And Geertz, after citing a passage by Kluckhohn (1962, 28), concludes that "in order to form concepts appropriate for every culture, we need make them so vague and generic that those concepts fade away" (Geertz 1973, 83). Sartori (1970) had already expressed a parallel and biting critique of all-encompassing concepts such as group (by behaviourists), structure and function (by functionalists) in political science.

The prevailing—although increasingly tacit—assumption that concepts need be general[10] was questioned by Durkheim, with apparent reference to natural scientists' classifications: "If the concept of concept can be applied to genera, species, varieties—no matter how restricted—why shouldn't it be possible to extend it to the individual, i.e., to the limit to which one arrives by progressively reducing the extension? In fact many concepts have individuals as referents" (1912, 473). In a similar vein, Boniolo has stated (1999, 294-306) that man uses concepts with unlimited extension as well as concepts with limited extension and concepts with an extension of one.

Depending on the characteristics of their intension, some concepts are more general than others. However, if two concepts belong to a different domain (e.g., furniture on one hand and emotions on the other), judging as to their different level of generality is an idle exercise. Even when two concepts (G and S) belong to the same domain, the question of their level of generality can be settled without question only if all the referents of S are also referents of G, and not all the referents of G are also referents of S. For instances: all cats are felines, but not all felines are cats. If and only if this condition is satisfied, one can say that

G and S belong to the same scale of generality;

G is a genus and S is a species.

As Aristotle has clarified in his *Analytica priora*, the genus/species distinction is analytical, in the sense that the same concept is a genus with respect to concepts at a lower level in its scales of generality, and is a species with respect to concepts at a higher level. Two concepts may belong to the same scale of generality if and only if we are disposed to constitute this genus/species relationship among them.

I prefer the expression 'scale of generality' rather than 'scale of abstraction,' as the term 'abstraction' is ambiguous; sometimes it is synonymous with a higher level of generality, but at others it refers to something not perceivable by the five senses.

However, the referents of a concept may or may not be directly perceivable by at least one of the five senses. Further, a referent may be singular (the personal computer on which I am now writing), plural (all the computers that I own or have owned), general in various grades (all the personal computers now on the market, all the computers) or universal (all the instruments that have been, are being, or will be used in order to write something down).

It is perfectly clear that the distinction perceivable/not perceivable by no means overlaps with the scale singular/plural/general/universal. First and foremost, this is because the former only applies to referents, as concepts are all not-perceivable; the scale applies to concepts as well as to referents (and is usually applied to the latter). Second, this is because the distinction perceivable/not perceivable may be considered a clear-cut dichotomy, while the other is a scale with a potentially unlimited number of levels between singular and universal. Last but not least, because concepts at any level of the scale (singular/plural/general/universal) may have perceivable or not perceivable referents (my pc/several pcs/all pcs in that school/all pcs that have ever existed, exist or will exist; the emotion I am feeling at this particular moment/the emotions we are feeling now/all the emotions we can feel/all the emotions that have been, are being, or will be felt).

Now that this has been clarified, the reason should be clear why the expression 'scale of abstraction' tends to induce one to think that, at the higher levels of the scale, we find concepts with non-perceivable referents, while, at the lower levels, we find concepts with perceivable referents.[11] However, this is utterly impossible. A concept with perceivable referents and a concept with non-perceivable referents cannot belong to the same scale of generality; the electoral urn can be a species of urn, a species of container, etc., but not a species of the right to vote or of political freedom.[12]

Each aspect of the intension of a concept can be articulated, thereby producing a different scale of generality; according to which aspect is being considered, a concept can be inserted into a different scale. For example, from the genus 'mammal,' we can descend to

- Marine mammal by articulating the aspect 'habitat;'
- Herbivorous mammal by articulating the aspect 'diet;'
- Extinct mammal by articulating the aspect 'present survival of the species;' and so on.

Each one of those concepts (marine mammal, herbivorous mammal, extinct mammal) is a species of the concept of mammal and forms with it a different scale of generality. As is well known, the aspect being articulated is designed by the Middle-Age Latin expression *fundamentum divisionis* (dividing ground).

As they have been formed by articulating different aspects, the three species being mentioned above are not mutually exclusive; we can think of a marine herbivorous extinct mammal—an older version of the otter which lived at sea. Symmetrically, if the intension is reduced by generalizing one of its aspects, from a concept we can climb up the corresponding generality ladder. For instance, from the concept of young Russian soprano we can climb to:

- Young soprano by generalizing nationality (i.e., by eliminating the corresponding aspect of the intension);
- Russian soprano by generalizing age;
- Young Russian female singer by generalizing timbre of voice.

Each of these concepts may form a scale of generality where it acts as a genus and the concept of young Russian soprano is a species. Working further on the example, it is easily shown that we may pass from a more specific (young Russian soprano) to a more general concept (singer) through several different scales, according to the order in which we generalize some aspects of the concept's intension (in the example, nationality, age, and timbre). In other words, scale of generality may cross, although they do not need to. It all depends on which of the potentially numerous aspects of a concept's intension we chose to generalize and in which order.

4.0 Voiceless terms?

The fourth issue I listed at the beginning of the essay is whether concepts are (or have to be) as "clear and distinct"—as Descartes said of ideas—in men's minds as terms are in men's speech and writing.

In general, classical Greek philosophers do not face this issue directly; rather, they are worried about the

objectivity of language, i.e., its direct relationship with reality (Gadamer 1960). "Language is a mere duplicate of Being" (Rorty 1982/1986, 145; Ogden and Richards 1923, 81). According to the pre-Socratic Parmenides, it is Reality itself who forces Man to choose the Unique Straight Representation of itself. Besides Parmenides' eleatic school, Heraclitus speak of a "natural straightforwardness" (ορθοτης) of words, and Antisthenes maintains that one cannot speak of something that doesn't exist (Diels and Kranz 1903, fragm. 23 and 114). According to the post-Socratic Epicurus, it's Human Nature that, before any image and in presence of any emotion, compels men to utter the sounds which are appropriate to each image or emotion (Diogenes Laertios, *Vitae Philosophorum* X, 75-6). An identical doctrine is repeated by the Latin follower of Epicurus, the poet-philosopher Lucretius (*De rerum natura* V, 1027-8). By the way, this form of naïve epistemological realism is not shared by all ancient thinkers. For instance, in Mahayana Buddhism, reality cannot by grasped by our thoughts; the tendency to take man's reconstruction of reality as reality itself is criticized and even teased as childish (Suzuki 1968; Capra 1975).

The question whether words are nature (φυσις) or convention (νομος) is the subject of Plato's dialogue *Cratilos.* The dialogue's name-giver defends the standard thesis of a natural resemblance between words and things, while Hermogenes defends the conventionalist thesis: the only source of a word's meaning is the interaction between speakers, which builds up a habit and inter-subjective agreement. Socrates remarks that some names reveal the nature of the things they designate; therefore they cannot be purely conventional. On the other hand, the terms designating numbers, for example, need be conventional because numbers do not exist in the real world. Plato concludes (*Cratilos* 435c):

> I do prefer that, as far as possible, words resemble things; however, I am afraid that this bias in favour of resemblance might bring us onto sloppy ground. As a consequence, we need resort to a more primitive tool, such as convention, in order to understand how names are given.

To the best of my knowledge, the sharpest confutation of the one-to-one correspondence between language and reality in pre-Socratic philosophy is due to the atomist Democritus, who remarks that 1) different objects are often designated by the same name; 2) the same object is often designated by different names; 3) the names designating an object may vary across time; and 4) the reasons why names are tied to objects present the utmost variety (Diels and Kranz 1903, fragm. 26). It may be remarked that this excellent confutation does not resort to the most obvious argument (the same object is designated by different terms in different languages). This curious oversight is easily explained by the crude ethnocentrism of Greeks—laymen as well as philosophers. Since as early as the eighth century BC, Greeks had regular trading relationships with most Mediterranean peoples, but they considered whoever spoke a language different from theirs to be a stutterer (βαρβαρος, whence our term 'barbarian').

Aristotle introduces "the psyche's affection" (i.e., the concept) between the term and the object designated. The relationship between object and concept is natural, while that between concept and term is conventional (*De interpretatione* I, 16 and II, 16, 26-28). Yet, the "apophantic" language describes the essence of reality; hence it cannot be conventional, in that it is used to decide truth (if the union of words reproduces the union of real objects) or falsehood (if it doesn't). However, several other languages exist aside the apophantic: the rhetoric and the poetic among them (*De interpretatione* IV, 17). A mediating position and role of thought is implied by Augustine, the bishop of Ippona (*De doctrina christiana* II.1.1), Severinus Boethius, and Pierre Abelard (*Ingredientibu*s).

By far the most sophisticated reflection on the topic in Western antiquity is due to the Stoic school and, in particular, to the epistemologist Chrysippos (see Heinze 1880; Mates 1961), who carefully distinguished the sign (το σημαινον), the meaning (το λεκτον: what has to be said) and the reality (το τυγχανον: what happens). In the Hellenistic period, Chrysippos' distinction was reasserted by two sceptical philosophers: Enesidemos of Cnossos and Sextus Empiricus (Zeller 1845-52, III, 1-45). Thence it went lost for centuries.

In the Middle Ages, Parmenides' idea of a threefold correspondence reality-thought-language is resumed—for instance, by the Spanish grammarians Modistae (Bursill-Hall 1971)—more as the yearning of an Eden-like state of candour than as a description of an actual state of affairs. Such an ideal is by no means alien to the project by the Majorcan Raymond Lully (1305-08) to decompose any idea in its simple components so that a sort of combining mechanism might produce all possible true propositions,[13] a project that strongly influenced both Descartes and

Leibniz. For Thomas Aquinas, the word directly mirrors the corresponding object, having left behind the course of thought that formed it. It is not just an expression of the soul, but it tends to *similitudo rei* (resemblance to things: *De veritate,* in *Quaestiones disputatae).* Both William of Ockham and Nicholas Krebs (Cusanus) in fact revive Aristotle's thesis (see above); the former, as he distinguishes between natural signs (i.e., concepts) and signs "arbitrarily set forth to designate things" (*Summa Totius Logicae* I, 14), and the latter as he states that *impositio nominis fit ad beneplacitum* (the assignment of terms is arbitrary). Yet terms have a necessary relationship with the *nomen naturale*, which corresponds to the *forma* (the thing in itself: *Idiota*, vol. II: *De mente*, 3.2).

On the other hand, for Descartes and the authors of the famous Port Royal Logic (Arnauld and Lancelot 1660; Arnauld and Nicole 1662), language perfectly reflects thought or is expected to do so. It may happen that language betrays thought's logical structure; the task of rational grammars is to reinstate that correspondence whenever it has been betrayed.[14]

For Hobbes (1655), the only way to give meaning to a word is by associating it to an observable phenomenon. However, for Hume (1739; 1748) that correspondence of ideas to sensory impressions has to be checked, because human imagination may produce complex ideas tied together in a way independent from links between impressions.

In the early modern age, the idea of a natural one-to-one correspondence between concepts and terms is openly criticized by Locke (1690/1951, 7) only:

> Words are not used by men as signs for their ideas due to a natural link between an idea and a corresponding sign: if this were true, there would be but a single language on earth. This correspondence is due to an arbitrary decision to adopt a particular word as the sign of a particular idea.

Despite the reasonableness of Locke's (and Democritus') arguments, the idea of a one-to-one correspondence between concepts and terms, with no mediation by thought, has been reinstated over and over again well into the present centuries. Perhaps the main reason is an intellectual distrust for something as volatile and hard to seize as concepts. However, anyone who reflects on the point should agree with Kant (1800, II.103) on the impossibility of seizing exactly which concept is passing in the mind of a specific individual at a particular instant, so as to warrant the perfect identity of that concept with the concept passing in the mind of another individual at the same or at another instant. This is exactly what is implied by Kuhn when he condemns "expressions like 'vagueness of meaning' or 'open structure of concepts.' Both seem to blame an imperfection, something missing that should be supplied," while concepts cannot be but open-textured; whoever attempts at making them solid and sizeable misunderstands or forges their nature (1974/1985, 348).

That characteristic of concepts is precisely what gives them the flexibility needed to confront rapidly and effectively a variety of new situations (Bower 1975/1983, 70) and to construct arguments much more insightful and powerful than those of formal logic—which need operate, in order to warrant certainty, on concepts whose intension has been curtailed and crystallized, with the result of exsiccating them and making them artificial like flowers in a herbarium.

It is perfectly understandable that specialists of formal logic prefer solid, tangible terms to volatile concepts. This annoyed, almost apprehensive attitude at concepts is well expressed by Frege's remark: "An area not clearly delimited cannot be called an area" (1903, II, sec. 56). To avoid that quicksand, Frege is eager to distinguish between objective thoughts and subjective mental images: "The concept is something objective that neither is built by men's work, nor is formed in men's minds" (1892/1966, 379). Thoughts are eternal, unchangeable: "Sometimes only after several centuries' enormous intellectual efforts manhood has obtained the knowledge of a concept in its pure form, scratching away all the irrelevant incrustations that veiled it to the mind's eyes" (1884/1966, 218); "if in the everlasting fruit of all things did not exist anything eternal, unchangeable, man could not possibly know the world and everything would fall into chaos" (*ibid.*, 4).

The platonic legacy is evident in those positions of Frege's. A similar fear of vagueness and confusion has been expressed by Bolzano (1837, sec. 19), Scheler (1926), Husserl (1939), and Smith and Medin (1981). At the turn of the 20th century, a distinction very similar to Frege's (see above) is voiced by Durkheim and Mauss: "The elementary classifications worked out by primitive people on emotional grounds" are no concepts "because concepts are precisely delimited and defined" (1901-2, 7). A decade later, Durkheim sounds even closer to Frege; in his last important work he contrasts concepts and sensations: the latter "follow each other in a perpetual flux …. I cannot transfer a sensation from my conscience to another

conscience .... On the other hand concepts are timeless and changeless … located in a different space" (1912/1963, 473).

While on the continent, Frege and Durkheim transferred concepts in a transcendent space, in Great Britain, Bertrand Russell reified them. He went as far back as Antisthenes and Lully (see above): "In any proposition that we can imagine ... all the components are indeed entities with which we are directly acquainted" (1905, 481). In an ideal language, "there would be but a single word for any simple object, and any non-simple object would be expressed by combination of words, each one for each simple object entailed" (1918-19/1956, 197-8). If there is a direct one-to-one correspondence between objects and terms, why should we need meanings (i.e., concepts)? Russell had eagerly drawn a conclusion: "The notion of meaning seems a confused mixture of logical and psychological elements. All words have meaning, in the sense that they stand for something different from themselves. But a proposition ... does not contain words, but the entities designated by such words. Therefore meaning is irrelevant for logic" (1903, 127).

A merely extensional interpretation of language had never been expressed with such a candour (and strength). Wittgenstein, then a pupil of Russell's in Cambridge, devotes his first important work to a systematization of his master's stance: "A proposition is a representation of reality; if I understand it, I know the situation it represents without an explanation of the proposition's meaning" (1922, sec. 4.021); "The essence of a proposition is shown by the hieroglyphic writing, which paints[15] the objects it describes" (1922, sec. 4.016).

The Vienna Circle and all the early neopositivism inherit from Russell and Wittgenstein the idea of a total isomorphism between language and reality,[16] thereby reducing language to a mere nomenclature. This extensional interpretation of language is one of the foundations on which the early neopositivists ground their well-known equation of the meaning of a sentence with the method used to verify it, due to the fact that in order to check the truth-value of a sentence we need resort to the extension of the terms it includes. The other foundation is Frege's thesis whereby the main semantic vehicle is not the term, but the proposition (1884, sec. 60): this is due to the fact that only propositions, not terms, have a truth-value.

This equation has always been attributed to the Vienna Circle—indeed, identified and criticized (e.g., Popper 1932; Henle 1963) as its first strong stance. But it can already be found one century back, in Comte (1830/1842, VI, sec. 600): "Each proposition that cannot be reduced to a simple statement of facts, particular or general, cannot have an intelligible and real meaning." And in the very same years of Carnap and Neurath, the Nobel physicist Percy Bridgman (1927, 28-30) independently stated: "In order for a question to have meaning, we must find operations through the question can be answered. In many cases it will be found that such operations are not possible: thence the question is meaningless … I am convinced that many of the questions we pose on social and philosophical themes will be found meaningless if examined from the vantage point of operations."

However, as it has been stated above, the neopositivists were rather influenced by Wittgenstein's *Tractatus*, and their reduction of meaning to empirical verification was intended by Waismann (1930, 229), Schlick (1931, 156),[17] and Carnap (1932) as a strict consequence of *Tractatus*' sec. 4.024 ("understanding a proposition means knowing what is the state of affairs is it is true").

Though being almost uniformly criticized by philosophers and linguists, this reduction of language to nomenclature and of meaning to verification gained a few important followers in Great Britain (Ayer 1936) and in the United States (Stevens: "A concept, or proposition, has a meaning only if it stands for some definite and concrete operations that may be executed by normal human beings" [1935, 517]).[18]

In order to escape hard criticism, most members of the Circle decided to abandon that thesis, and Carnap was informally charged with "liberalizing" it, with a long essay (1936-37) that marked a turning point in the Circle's epistemic stances. However, what was conceded on one side was more than recovered on another side, with Neurath's so called "physicalism" (1931), i.e., the thesis that language is a just a physical phenomenon among others—a thesis to which Carnap promptly adhered (1931); some years later he defined semantics as "a relationship of designation between linguistic expressions and *other* objects" (1938; italics ours).[19]

In the positivist and neopositivist obsession with objectivity and absolute certainty, physicalism is a step further than extensional semantics. The latter reduces the threefold relationship between reality, thought, and language to a binary relationship between reality and language, doing away with that foggy, unstable, and unreliable element—thought. The former removes any residual element of incertitude and flexibility by establishing a monadic unity: if concepts are voiceless terms, and terms are just objects as any

other, there is no semantic relationship—indeed, there is no semantics in that granitic monolith.

In the years between Russell and the Vienna circle, but independently from both, a movement born in the United States launched a different attack on the role of thought: it aimed at eliminating thought, and whatever else takes place in the mind, from the legitimate objects of science. It is paradoxical that—barring a precursor in political science (Bentley 1908; see footnote 19 below)—the movement originates in psychology, given it advocates a dramatic restriction in that science's field of interest. In fact, it is stated that psychologists should advance no hypotheses on what goes on inside the brain (re-christened "the black box"). The only proper task is to record whatever can be perceived by the senses: stimuli that enter the box, responses that exit from it. Concepts and terms like desire, intention, will, awareness, conscience, and feeling are banned. The only admitted object of study is behaviour: thence the movement's name, behaviourism.

In fact, there was a devious way of introducing through the window what had been solemnly thrown out of the door: thought could be spoken of and studied under the strict condition of considering it like a tacit speech the speaker was addressing to him/herself. "To speak openly or to themselves (i.e., to think) is as objective a behaviour as is baseball" claims John Broadus Watson (1924, 6), the founder and avowed leader of the movement—at least in psychology.[20] To legitimate the trick on the verbal plane, he had already coined the term *speech-thought*, immediately translated as *Sprechdenken* and adopted by the leading neopositivist Otto Neurath.

The behaviourists' identification of thought with a sort of tacit language aroused a number of experimenters who—having filled the mouth of their unfortunate subjects with electrodes, wires and even more disturbing gadgets—asked them to think on some term and then to utter it in a loud voice (Wyczoikowski 1913; Reed 1916; Clark 1922; Thorson 1925). Their objective was proving that, while thinking of a word, a person moves exactly the same muscles in the oral cavity that are moved in uttering it. We can get an idea of how pervasive and lasting was the influence of behaviourist tenet if we consider that, even after his famous epistemological turn, no less critical an intellectual than Wittgenstein afforded credibility to such an absurd theory: "We can imagine that men tacitly compute by moving the muscles of their larynx .... Individuals might exist who can detect the inner thoughts of other people by simply observing the movements of their larynx ...." (1953/1987, 289 and 290).

However, although it be conceivable that the muscles' movements were reactions to the vexing presence of gadgets in one's mouth, and therefore similar in both experimental situations (thinking on a word and uttering it), the coveted proof was admittedly not reached, and—after decades of gadgeteering, and the filling of libraries and psychological reviews with research reports—that research tradition was tacitly abandoned.

In their efforts to find "objective alternatives to the processes of thought" (as stated by the leading second generation behaviourist Skinner [1969/1972, 266]), the members of that school assumed that, in studying men as well as animals, one should follow strictly the so called "Morgan's crown," a maxim due to the 19th century psychologist Conwy Lloyd Morgan (1884, 53): "In no instances should we interpret an action as the product of a superior psychic faculty if it can be interpreted as the product of a faculty located at a lower psychic level."

Even granted that assumption, behaviourists "had to descend many steps in the phylogenetic ladder … and to set up particularly rigid experiments … in order to reduce to their stiff stimulus-response scheme animal behaviours that otherwise would evidently exhibit insight, intentionality, problem solving ability" (Taylor 1970, 67).

By using, almost exclusively and for decades, two experimental settings (a labyrinth in which rats or guinea pigs should find their way out and a small room where pigeons should push the right lever in order to obtain food) behaviourist psychologists have produced an impressive bulk of results as to how those small animals react and may be conditioned while in captivity; such results about captive rats and pigeons have been lavishly and with no hesitation extended to man (e.g., Skinner 1938, 1969), sometimes even in the books' titles.[21]

For almost half a century, behaviourism was the mainstream of psychology and gained a remarkable influence in linguistics and political science, the two former sciences being particularly interested by the tenet that thought was nothing else than silent language. Although very popular among some members of the Vienna circle, behaviourists did not openly subscribe to the extreme monism of physicalists (sec. 4), which reduced language to a fact among any other. Implicitly, they accepted the language-reality dualism that had dominated among philosophers of knowledge thus far.

Another approach to the relationship between thought and language emerged in the 20th century. Several authors reject the idea of a complete identity between the two; yet they theorize a sort of genetic dependence of the former from the latter. In Peirce's words, "man can think only by means of words or some other external symbol" (1931-35, sec. 5.313). A similar point of view is adopted, more or less explicitly, by such diverse thinkers as Cassirer (1923-29), Vygotskij (1934), Wittgenstein (1953), and Gadamer (1960). In one of his first works, Chomsky (1957) assumes that concepts are created through and by language and that man's conceptual patrimony is entirely formed by linguistic expressions. Recalling Descartes and Port Royal, he maintains that linguistic and conceptual processes are virtually identical, while the rules governing the conversion of deep into superficial structures may differ from an idiom to another (Chomsky 1966). In a later work, however, Chomsky (1968) considers mental activity as a pre-condition of language—an opinion strongly supported by Lenneberg (1967) and apparently shared by Piaget (1937).

4.1. Threefold conceptions

We have seen above (sec. 3 and 4) that, from the stoic Chrysippos on, very few thinkers managed to maintain or imply a threefold relationship between reality, thought, and language. A turning point may be considered an essay in which Frege (1892) stated that every sign (*Zeichen*) has a meaning (*Sinn*) and a *designatum*, or reference (*Bedeutung*); in fact, in the following years that threefold conception was subscribed by many—Peirce (1902) distinguished between sign (or *representamen*), interpretant and object; Gomperz (1905) between verbal form (*Lautung or Aussage-laute*), meaning (*Sinn or Aussage-inhalt*), and fact (*Tatsache or Aussage-grundlage*); Dewey (1925) between event, concept (or cognitive object), and sign; Morris (1938) between sign vehicle, *significatum* (the concept), and *denotatum* (the object).

Charles K. Ogden and Ivor A. Richards (1923) have drawn a famous triangle on whose vertices stand referents, thought and language; while the lines (i.e., the sides of the triangle) linking thought to language and to referents are solid, the line linking referents to language is a dotted one. By that, the authors mean the relationship between those two vertices is always mediated by thought.[22] The Italian political scientist Giovanni Sartori (1979, 24) has made that famous triangle a constant point of reference in his works; nevertheless, he has claimed that "thoughts and words are so intimately connected and interdependent that it is utterly impossible to consider an element abstracting from the other." Perhaps it is not impossible; however, it certainly needs a continuous effort of attention, mainly because we have no other means but language in order to give a stable form and communicate our ideas about language itself, about thought, and about their relationships.

It so happens that even very careful and self-controlled authors do use indifferently the words 'concept' and 'term' in the same sentence and with the same meaning. Here is an example from a sociological text by Barry Barnes (1982/1985, 53; italics ours):

> Individuals do not follow some sets of rules or instructions in using a *term*. The appropriate use is established by the collectivity: *concepts* cannot by themselves communicate the appropriate way to use them. People decides when a *term* is properly applied to a specific referent.

In this passage, Barnes refers to terms even when he writes 'concepts.' This confusion is very frequent, though seldom so evident. It is evident in the following passage by Popper (1984/1989, 59; italics ours): "The idea that we must define the concepts in order to make them exact, or even to confer them a meaning, is a will o' the wisp," and in the following passage by Nowak (1976, 291; italics ours): "The concepts form the language in which a theory is formulated... They should be defined so that they have the same meaning in many different theories."

If one cannot demand an effort at distinguishing concepts from terms in ordinary conversation, that effort could possibly be required from philosophers of knowledge or of language and kindred specialists when they talk in their capacity as specialists. Since Democritus' times, the many untenable consequences of the identity thesis have been clearly exposed. Any reasonable human being, after pondering on the subject, should conclude that the joint between concepts and terms cannot be rigid, for at least three reasons:

> a) "The human mind forms concepts more easily than it invents words" (Tocqueville 1835-40, II, 264); "We have more meanings [concepts] in mind than words at disposal" (Sartori 1984, 35).
> b) New words and new acceptations (meanings for the same word) are created continuously;
> c, and more generally) No rigid joint can be postulated between something as perceptible—

by sight or hearing—as a term and something as volatile and impalpable as a concept.

If the only reason were that considered under (a), i.e., the fact that concepts are more numerous than terms—and assuming for a moment that we could count the former as we can count the latter—then we would have a situation in which any single term would have many meanings (i.e., one term ⇒ many concepts). However, as it can be easily ascertained, the opposite situation (one concept ⇒ many terms) obtains as well.[23] The same assertion can be expressed in many different ways not only in different idioms, but even in the same idiom, dialect, professional jargon, etc. "There is no a priori warranty that two members of the same linguistic community will use the same word with the same meaning in any circumstance" (Phillips 1977/1981, 174); keen observers of daily life may have drawn the experience that many quarrels arise from the fact that two contenders are using the same words with different meanings while they assume the contrary and look elsewhere for the reasons of their quarrel.

After that pondering, the idea of a one-to-one concepts-terms correspondence, advocated by a number of intellectuals over centuries [see above] can look nothing more than shallow, and Peirce sounds ingenuous when he claims, rather coarsely, that pragmatism aims at "establishing the true meaning of every concept, doctrine, proposition, word or other sign" (1905, sec. 5-6).[24] John Stuart Mill sentenced all such endeavours to death (or—if you wish—to exile in the land of artificial languages) when he remarked that a natural language "is not made, but gets itself made" (1843, I.viii.7).

One of the motives for which we tend to speak of "concept X" while we should speak of "term X" (or rather, of "conceptual area covered by term X") is that, by "concept X," we intend the set of current meanings of the term X—i.e., a set of concepts, whose membership and confines can but be vague due to the concept's nature itself. The semantic distance between any two members of such sets can be remarkable:[25] in similar cases, it will be more likely that one realizes that "the term X has several meanings." But normally, everybody assumes that each term occurring in a conversation has the same meaning for all the interlocutors, and further assumes that all the interlocutors make the same assumption—these were the assumptions that Garfinkel's students were invited to challenge in his "ethnomethodological experiments" (Garfinkel 1964).[26]

As those experiments effectively show, assuming that everybody in a linguistic community interprets each term in the same way is essential for the quiet running of daily life. However—as we mentioned above—a bit of reflection on everybody's experience should suffice to conclude that such an assumption, however comfortable, is patently false.

4.2. Are concepts joined to terms?

Only in artificial languages that "are made" (as Mill would say) by some authors and only rarely (as in the case of mathematics) elaborated by a restricted community of super specialists, the concepts-terms joins are imagined as being rigidly one-to-one. Each term is not produced spontaneously in daily utterances and conversations, and then incorporated into general speech if it is largely adopted by members of a community. Rather it is introduced through a deliberate act and with an explicit definition by a specific and identifiable actor, who usually is a specialist in the field to which the new term is intended to belong. Given the fact that, on one side of the join, there is something as volatile as a concept, the author or linguistic community attempts to fasten that particular concept-term join by establishing syntactic links between the new term and other terms, already defined in the artificial language, whose meaning has been made (more) stable and univocal by use.[27]

If the artificial language is not a private *divertissement*, but has been imagined with a function and by a member of a community of users, the new term and its definition have to be screened by that community before being accepted. This procedure, together with the small number of users of an artificial language and with the abstractness and limited intension of its concepts, authorizes one to assume that the concepts-terms joins in those languages are actually rigid.

In the natural languages that are spontaneously produced in the daily life of a community, we may, as dictionaries do, juxtapose various definitions of the same term, in order to explore and identify all of its possible meanings, i.e., all of the concepts that it may denote. However praiseworthy may be this hard work, it cannot claim to be exhaustive, for the reasons listed—under a), b) and c)—in the previous section. In the daily life of a community, new concepts are continuously produced, while the creation of a new term is a relatively rare event: people usually resort to existing terms in order to denote a new concept, and there is no way of restraining each one's liberty in choosing the term considered most appropri-

ate in that very instance. Moreover, fixing in a definition the intension of even a very simple term is a very hard task for both the man in the street and the scientist, as many researchers have shown.[28]

Many authors remark that in scientific languages, in which the artificial part varies from one discipline to another but is usually rather low, the terminology is less equivocal than in ordinary languages: the concept-term joins are much more rigid. This self-gratifying thesis is, of course, very popular in the academic world, particularly among French pupils of Bachelard,[29] latter-day neopositivists, but also among others.[30] In several essays, I submitted it to an accurate check as regarding three fetish terms of the scientistic (i.e., positivist, behaviourist, neopositivist, operationist) approaches, and it turned out to be false; in a selection of scientific works the acceptance of these three terms was manifold even within the same work—the results of those checks are summarized in Marradi (2009). In an earlier work,[31] I performed a slightly different check. I compared the semantic dispersion of the fetish term of the so-called post-positivists (theory) in five ordinary languages (as recorded in their monolingual dictionaries) and in a selection of works taken from "hard" and "soft" sciences; the acceptance of the term in scientific works was much more numerous and far between than in ordinary languages.

It may be objected that such a check concerns a too limited population of four cases: true. But what about the fact that there is practically no important term or meta-term[32] in the social sciences whose ambiguity has not been lamented by the authors of the related monographs? Raymond Williams (1976) has devoted an entire monograph to the semantic dispersion of some hundred key terms in the social sciences, adding for each term an essay on the diachronic evolution of its meanings. However, despite that evidence, the fact that most monographs on a key concept open with a chapter devoted to its ambiguity, and despite some more general warning,[33] most social scientists, including many that had lamented the ambiguity of a term being the object of their monographs, seem reluctant to abandon the dogma of a superior precision of scientific language, or at least do not care to reflect on that issue.

5.0 What is the contribution from terms to an individual's and a community's conceptual richness?

Having insisted on the sharp difference between thought and language, and on the absolute lack of rigidity of the joins between the two, I by no means intend to conclude the full independence of the former from the latter. I will explore in this section the gamut of services that language renders to the development, consolidation, and, obviously, communication of thought.

As Hobbes observed, the process by which thought is converted in a chain of terms "blocks its rapid flow" (1642, II.2). A volatile concept becomes something stable and tangible: "While being fixed in some sign, concepts gain in precision" (Cassirer 1923-29/1961, 20).

Some linguists have over generalized the role of language: "Thought, chaotic by nature, is forced into order" (Saussure 1916/1974, 137). Others have over stated it: "The concept does not attain an individual and independent existence until it finds a linguistic realization" (Sapir 1921/1969, 17). I consider this an over generalization, because not all thoughts are necessarily chaotic and because many concepts do not need a linguistic form in order to be clear in the thinker's mind and even in order to be communicated.[34] Without entering in the above details, John Stuart Mill expressed a similar opinion: "Some authors have asserted that language is not *an* instrument of thought, but *the* instrument; that terms are necessary in order to think .... This opinion must be considered an exaggeration" (1843, IV.iii.2; italics ours).

When a concept takes on a linguistic form, it gains precision not only for the (possible) interlocutors, but first of all for the thinker her/himself;[35] it remains at her/his disposal in a stable form, easy to remember and to retrieve. As is not uncommon, William James has described that process in the most pregnant way: "Language has the function of supplying a stable support, so that concepts may be evoked whenever needed *without any detriment to their elasticity*" (1902, 446; italics ours). Anchored to language, thoughts—about experience, impressions, etc.—remain at hand that would most probably fade away and vanish as time passes. "By themselves concepts slip gradually out of our consciousness, but their name remains with us and by uttering it we recall them immediately" (Bain 1864, 43).

We recognize more promptly that we are thinking on (more or less) the same referent on which we were

thinking at some past moment if, in a tacit speech to ourselves, we are using the same terms. On the other hand, the fact that we are using the same terms does not guarantee that neither the concepts nor the referents are actually the same. We may easily find evidence of that if we define the same term several times at suitable intervals and record our definitions without trying to memorize them.[36]

The differences that will emerge (both between definitions given by different individuals and between definitions given by the same individual in different moments) do not depend only on the fact that the same concept may be verbalized in many different ways, but also on the fact that the same term can bring to our mind different concepts; if their intensions are not exactly overlapping, we, in fact, deal with two different concepts, and it is likely that some of these differences, in intension, have been expressed in some of the definitions that have been given to the term. Paradoxically, it is just the fact we are using the same term (in a conversation) that makes it easier to ascertain what different concepts the interlocutors have in mind; in fact, the presence of the same label signals which elements I must collate.

The supporting function of language has been underlined since Bacon (1623), Locke (1690), and Mill (1843, IV.vi.3); more recently by Heider (1958), Lloyd (1972), Sartori (1984), and Simone (2000), among others. The Argentine political scientist Strasser has added a sharp remark: "The relative poverty and the nature inevitably limited of language make it easier to handle it on the part of thought, which has promoted its extraordinary development" (1979, 171).

Once made explicit in language, thought takes an objective appearance: "Language classifies experiences, shelving them in general categories so that they have a meaning not only for who made the experience but also for others" (Berger and Luckmann 1966/1973, 63). Once made anonymous, a particular experience can be assimilated to any other belonging in the same category. Having been moulded into an intersubjective code, thoughts may be communicated; terms and expressions are "the public side of concepts" (Toulmin 1972, I, 158).

The presence of an intersubjective linguistic code obviously entails an extraordinary enrichment of the range of thoughts that can be communicated, that otherwise would be restricted to whatever can be represented by gestures. As has been stated above, we should not assume that the code is shared in its entirety, thereby permitting a perfect communication. But misunderstandings would be incomparably deeper and more frequent if individuals had only gestures at their disposal to communicate.

Thanks to its nature of (largely) intersubjective code, language performs for a community the same function of fixing and recording thoughts that it performs for the individual. By that means, experiences and objects distant in time and space are "made present" and a community's public knowledge sediments and grows (Mill 1843, IV.iv.6; Vygotskij 1934; Sartori 1984, 51; Berger and Luckmann 1966/1973, 64).

By learning to understand and speak her/his mother tongue, a young individual becomes a member of a culture, and, by that, inherits that culture's patrimony of shared symbols and common sense—a large and unfathomable set of intellectual and cultural resources that Schutz (1932) has called *Vorwelt* (a pre-existing world). Without that inheritance, each individual should begin from scratch in becoming acquainted with the physical and social environment. Thanks to intersubjective and enduring linguistic codes, "we still have intellectual access to Old Testament prophets, Greek philosophers, Renaissance humanists .... Language operates like blood in making possible the rapid circulation of any kind of materials at any distance" (Lidz 1981, 216).

Thanks to this expansion over time and space, "language makes possible socio-cultural life" (Sorokin 1947, 53). Schwarz and Jacobs have underlined the importance of this function for science too: " When doing research, both what I give for granted and what I think there is still to discover is based on written reports about what others have done, seen and heard" (1979/1987, 396).

5.1. Language and concept formation

In this section, we shall analyze more closely one of the services that language renders to thought, i.e., its contribution to concept formation. That contribution follows different routes whether the thinker already knows a term (i.e., is able to give it at least one of the meanings that it is currently given within the thinker's community), or whether he doesn't.

By the presence of a given term in her/his own memory, an individual is reminded that she/he has already faced and somehow solved the problem of conceptualizing a given referent (ah! it's (another instance of) a cat/table/lie/nervous breakdown). Terms operate as anchorages, as starting points in the conceptualization of the flow of experience—interior as well as exterior. Anchorages are comfortable, and abandoning them entails a loss of energy: this is the

main reason for the proliferation of meanings that most terms suffer in the course of time.[37] This process may reach a point in which no aspect of their intension is common to all the meanings of a term, and only a sort of "family resemblance" (Wittgenstein 1953, sec. 67) can be detected between them. However, sometimes the proliferation is stopped, or reduced, by the presence of a referent both well-known and easily conceptualized—an exemplar.[38]

An often quoted passage by Augustine, bishop of Hippo, described the process whereby a term unknown to an individual contributes to her/his concept formation: "When the adults mentioned some object and, while uttering that term, indicated something by their fingers, by observing their gesture I learned the name of that object" (*Confessions* I, 8).

By no means, in this passage or elsewhere, does Augustine state that this is the only possible process of concept formation—as it has been stated, among others, by the Alsatian physicist and philosopher Johann Lambert (1764, III) in commenting on that passage. Even less did Augustine maintain that the only possible referents are material objects—as it is implied in *Tractatus* (1922) by Wittgenstein, who then quotes the bishop's passage at the beginning of his *Philosophische Untersuchungen* (1953), as if he called Augustine responsible for his own juvenile blunders.

It is evident that a term repeatedly heard addresses the attention of a listener towards this or that aspect of reality, making it easier for her/him to identify and conceptualize a referent. But it is equally evident that a referent may be identified and conceptualized thanks to impulses non-linguistic in nature, but rather originating in the psyche of an individual or in the physical and/or social reality surrounding it; e.g., the reflexion on one's own experiences, on the behaviour of others, on one's bodily sensations, and so on.

A complex aspect of the relationship between thought and language is the adoption by an idiom of several terms taken from other idioms, but only in particular acceptances that enable the foreign terms to denote concepts belonging to special ambits, for which the idiom that adopts is poor of terms and roots. A few examples are the French terms *chef*, *comis*, *commande*, *coupé*, *atout*, *coup-de-vent;* the Italian terms *allegro*, *pianissimo*, *crescendo;* the English terms *goal*, *corner*, *target*, *budget*; the term *robot*, which in Slav idioms means just 'worker' and was given by the Czech engineer to the automaton he had assembled. In its original idiom, each of the above terms has various common and various special acceptances; the speakers of that idiom distinguish among them with the help of the relevant context, therefore with a rapid and tacit semantic work. By importing the foreign term in only one of its acceptances in its original idiom, the borrowing idiom acquires a term univocally[39] denoting a concept for which thus far it had no suitable term. This relatively rigid concept-term join reduces the tacit semantic work of both speakers and listeners. At a general level, an idiom acquires new terms and reduces the ambiguity of its own vocabulary; on their turn, some of those new terms will suggest conceptual developments, as most terms may do. Thanks to this complex itinerary, the adoption by an idiom of terms taken from another idiom may be considered a contribution of language to thought.

Language may give important contributions to thought also at levels more complex than concepts: the level of classifications, typologies, and taxonomies. The history of the natural sciences offers numerous examples, the most illustrious being the system of binary nomenclature by Linnaeus (1735), which put an end to centuries of conceptual chaos in a vast field going from botanic to mineralogy and zoology. Of comparable importance is the radical revision of the language of chemistry proposed by Lavoisier (1787) to the French *Académie des sciences* on the revolution's eve. This criterion, which allowed tracing the compounds back to their constituent elements, with the notational improvements introduced by the Swedish chemist Berzelius, is still in use today. Terminological innovations like these have paved the way for dramatic developments in the related disciplines.

The contribution of language extends up to the level of propositions and further up; an idiom's grammar and syntax provide moulds into which an argument is cast, with the manifold advantages of becoming more solid, more easily understandable by others, and—once incidental aspects are eliminated—even reproducible in different circumstances by the same individual or by others. However, all this does not mean that language is a necessary condition of arguments; the above mentioned advantages do not entail the consequence that "without having recourse to signs... man could never draw an inference beyond very simple instances... This is very likely the limit of the reasoning capabilities of animals lacking a conventional language" (Mill 1843, IV.iii.3).

Mill's statement is open to three different critical remarks:

a) Ethologists are just beginning to discover that the language of some mammals and birds is less simple than had been supposed until recently;

b) Ethologists have already discovered that animals of many different species are able to follow highly sophisticated lines of conduct whenever they are in a familiar environment and have a practical advantage to gain or a danger to avoid;[40] and,
c) In the numberless situations that—even in daily life—require instantaneous decisions, men prove to be able of some very sophisticated reasoning even if they lack the time to encode them into signs.

5.2. Asserting the dependence of thought on language

In this final section, we shall analyze a different way—that might be called "holistic" —of asserting the dependence of thought on language: the so-called "Sapir-Whorf hypothesis." The American linguist and anthropologist Edward Sapir (1921, 209) voiced it rather strongly in two famous passages:

> Human beings do not live only in a world of objects, or only in a world of social relationships, they are entirely dependent on the specific idiom used in their society .... They unconsciously build their 'real world' largely on the basis of the linguistic conventions of their community. There are no two idioms so similar as to represent the same reality. The worlds in which different societies live are different worlds, not simply the same world with different labels pasted upon.

and (1931, 578):

> Language is not a mere inventory … it is a creative and self-sufficient symbolic organization … which defines experience for us .... Meanings are not discovered in experience but rather imposed upon it, due to the tyrannical control exerted by the linguistic form on our orientation to the world.

These two statements are commonly considered "the pillars of the Sapir-Whorf hypothesis" (Bright and Bright 1965, 250). Whorf, a student of Sapir's, is considered co-author of the hypothesis because he embraced it with enthusiasm[41] and—without modifying its substance[42]—equipped it with numerous and impressive examples taken by American-Indian idioms. The triumph of the hypothesis—that he baptized "the principle of linguistic relativity" and, of course, the "new theory of relativity"—was a sort of personal crusade all his life through. After contrasting his lifelong passion with Sapir's intermittent involvement, many specialists prefer to speak of "Whorfian hypothesis" (e.g., Fishman 1960; Mounin 1963; Lakoff 1987).

In its starker form, the hypothesis proposes something reminiscent of Parmenides' thesis of identity (see 4.0 above), only in reverse order: for Parmenides, reality → (thought) → language; for Sapir and Whorf, language → (thought) → reality. Order of arrows aside, the only difference is that, in Parmenides' fragments that we know of, there seems to be no attention for thought as distinguished from language, while it is not clear whether Sapir and Whorf intend reality in itself or its representation in thoughts.

In the latter form, the thesis of a constitutive influence of language on the way in which the experience is conceptualized is not new: Johann Gottfried von Herder, a proto-romantic philosopher, maintained (1772) that language is the sole creator of human history. Later on (1784-91), he criticized Kant for proposing a general and abstract conception of human reason, disregarding the constitutive influence of the various idioms. Moreover, the thesis is not only a characteristic of romanticists; an illustrious member of the Enlightenment such as Karl Wilhelm von Humboldt asserted that language is the instrument by which since its infancy man looks at things, and that inevitably such instrument is interposed between man and reality (1836).

A lack of correspondence between the way in which various languages cut and organize reality had already been noted by Nicholas Krebs (Cusanus), when he observed that the same object or phenomenon finds a proper expression (*propria vocabula*) in an idiom, while it needs strange circumlocutions (*magis barbara et remotiora vocabula*) in another idiom (1450, II, 3). John Stuart Mill added a parallel remark: "The same term in an idiom corresponds, in different occasions, to different words in another" (1843, I.iv.1). Further and more important, as Whorf's examples—and numerous findings of linguists and anthropologists before him—show, idioms also differ as to the choice of core categories of syntactic organization. Due to these reasons, a word-by-word inter-idiom translation unfailingly produces ridiculous results. According to Gadamer, "to whoever really masters an idiom no translation looks possible" (1960/1972, 442).[43]

Those differences between idioms in syntactical categories and semantic (terms to concepts) links are evident to everybody who cares to think on it. The (rather obvious) weak link in Sapir and Whorf's argument is that it cannot be excluded that those depend on inter-cultural differences in conceptual or-

ganization. A priori excluding that entails assuming that idioms are born and develop in a cultural vacuum, through a mysterious agreement between mindless individuals. Even Whorf happens to concede that "language is nothing but a veil in the surface of deeper processes in men's consciousness, that are needed in order to make possible the emission of signals; if necessary those processes may realize a communication, even though not a full agreement, even without the intervention of language" (1956/1970, 198). It is clear (at least to the present author) that one cannot state that language governs (thought and/or) reality if she/he has not beforehand clearly distinguished the three spheres. And if we reasonably intend what Sapir and Whorf often call "reality" as "mental representation of reality" (i.e., thought), then the direction of the arrow of influence between the latter and language cannot be ascertained by the traditional empirical means due to the fact that one end of the arrow is occupied by a tangible element (language), while the other end is occupied by a non-tangible element (thought). Strictly speaking and for the same reason, even the existence of an arrow cannot be empirically demonstrated. Not by chance those who have commented favourably on the hypothesis have done so without resorting to empirical evidence.

In fact, a few authors have expressed discontent apropos the epistemic status of the hypothesis. Mounin has insinuated the need for "systematic experimental controls" (1963/1965, 115); for Henle (1958), we can only ascertain whether some linguistics categories co-vary with certain aspects of culture, but we cannot say anything about the direction of influence; more crudely, Schaff speaks of a "failure" due to "faulty fundaments" (1968, 112). However, to the best of my knowledge, only the anthropologist Robbins Burling has put his finger on the crucial epistemic problem: "The relationship that they claim to find between patterns of language and patterns of thought may be controlled only from the side of language" (1969, 28).

For this reason, the mountain of examples of different semantic choices and/or syntactic organizations in different populations that Whorf has patiently gathered and reported does testify in favour of amazing intercultural variability but not a trifle in favour of his hypothesis. And as regards Sapir, it is a fortune that his long-standing and well-deserved reputation be based on his manifold contributions to linguistics and to anthropology other than his renowned hypothesis.

Notes

[1] Among several others, the Italian sociologist Luciano Gallino did state the same (1992, 91).

[2] This citation comes from Einstein and Infeld (1938/1965, 53); however, the main advocate of this position is Cassirer (1923-29), inspired by Kant. Kant's conception of an active – not merely receptive – mind is (obviously) adopted by the cognitivists (Neisser 1967; Pribram 1971; Gardner 1985), and – on the whole – by Piaget's in his research on children's concept formation (1937; 1947; 1959 with Inhelder).The focus of some psychologists is placed on a different plane with respect to the axis of this debate, insofar as they connect concept formation to the execution of a task rather than to the representation of reality (see Ach 1921; Lloyd 1972; at times also Piaget 1937).

[3] Exceptions include, besides Schutz and his disciples, Mach (1905) and Gurwitsch (1940).

[4] The strong thesis that any different combination of said elements constitutes a different concept will be discussed subsequently. The examples quoted are sufficient to show how mistaken is the idea that a concept is a genus and its various aspects the species [on the genus/species relationship see section 3]. If anything, in some instances the contrary is true, in that at least some of the concepts forming the intension of concept A are genera of which A is a species (e.g.: the cat is a mammal, a feline, a domestic animal, etc.). In other instances a whole/part relationship exists (cats have two eyes, a liver, and a tail). In still others there is no relationship (cats climb trees, purr, etc.).

[5] E.g. Lotze (1843, sec. 15), Hamilton (1859-60, I).

[6] The idea of defining, or core, aspects is better defensible if the intension is held an attribute of terms rather than of concepts: it can be shown empirically that some meanings are ordinarily attributed to a term much more often than others. But the core / non-core dividing line loses meaning if one accepts the thesis that will be defended in chapters 4 and 5 i.e., that any concept is formed by the intension it has in the mind of the subject who thinks it: as such intension changes from time to time and from subject A to subject B, we are in presence of a (more or less) slightly different concept, even though subject A and subject B continue using the same term to design it.

[7] A simple and convincing example of the prototype approach to classification in real life has been supplied by Amstrong, Gleitman and Gleitman

(1983): all odd numbers are equally entitled to be called odds, but if we are asked to supply an example of an odd number, most of us would pick 3, or 5, or 7. In general, in the debate within the cognitivist field, we consider prototype theory more convincing than the idea of core properties. Also see Violi (1997, 183 ff.).

[8] Who has been the first to use the formula "we are dwarfs on the shoulders of giants."

[9] His family name was Schwarzerd, that he translated into Greek.

[10] This assumption has been exposed by Gellner (1964, 120), and lately criticized by Bower (1975). It is probably associated with the Scholastic tradition in teaching, which explains why it is more widely adopted in continental Europe than in the Anglo-Saxon world.

[11] This kind of confusion is far from absent in the scientific literature: e.g., Edel (1959, 185); Reynolds (1971, 49). Jackson goes as far as to put 'Lebanese Christians' at one end of his 'scale of abstraction' and 'ethnic category' at the other end (1984, 225).

[12] Dewey (1938/1974, 581) used a similar argument in order to criticize the use of 'abstraction': the term 'smooth' may suggest the idea of smoothness, but no genus/species relationship could be conceived among them. The reasons for keeping apart the concept of abstract and the concept of general have been effectively stated by John Stuart Mill : "The habit has been spread (...) to use the expression 'abstract noun' to all nouns resulting from a generalization. The expression 'general noun' is more appropriate for that use" (1843, I.II.4). Political scientists like Collier and Levitsky (1997, note 15) justify their preference for the expression 'scale of generality' on the fact that 'abstract' is opposed to 'concrete' rather than to 'specific'. And here is a remark by Elias: "Time is a concept at a high generality level. I purposively avoid to speak of 'level of abstraction': in fact, what time is abstracting from?" (1984, 52).

[13] A project whose influence has been recognized by both Descartes and Leibniz, and can be traced all the way down till Bertrand Russell (see below), the anthropologists' componential analysis (Goodenough 1956), the structure of electronic computing and the idea of artificial intelligence.

[14] Descartes and Port Royal logicians are explicitly referred to by Chomsky when he states that mental and linguistic processes are virtually identical; only the processes converting deep into surface structure differ from one language to another (1966). In the 19th century the identity between thought and language is affirmed, among many, by the German linguist Max Müller (1891, I, 526) and by Donaldson who appeals (1839, 69) to Cratilos, the dialogue that Plato devoted to the topic.

[15] Like many other stances by Russell and Wittgenstein, this description of hieroglyphic writing is oversimplified. In fact, hieroglyphs had a remote pictorial origin, but each of them stood for a sound in the Egyptian language. As it is well-known, in his later works Wittgenstein criticized and even ridiculed his own juvenile shortcuts.

[16] It is well-known that in thirties there was in Berlin a circle of intellectuals sharing most epistemological positions of their Viennese counterpart. However, the most eminent member of the Berlin Circle more than once recommended to keep concepts clearly distinguished from terms (see Hempel 1961/1965, 139; 1966/1968, 129).

[17] Schlick and Waismann were the most faithful of Wittgenstein's followers within the Vienna circle; Carnap was more sceptical, as he openly showed in his intellectual autobiography (1963).

[18] Stanley Smith Stevens one of the leading psychophysicists in the thirties through the fifties, has been the author of the universally used—although strongly criticisable—classification of levels of measurement (nominal / ordinal / interval / ratio). As the quoted sentence —among many other— shows, his links, and debts, to neopositivism through operationism are stronger than usually recognized.

[19] A more moderate stance is taken by Alfred Tarski, a highly respected Polish logician very close to neopositivists: "Semantics deals with the relationships between linguistic terms and the *objects* to which the terms refer" (1943-4, 341).

[20] Political scientists of behavioural orientation claim priority for Arthur Fisher Bentley, who already in 1908 clearly stated the essential of what was going to be the behaviourist manifesto by Watson (1913). Yet, as regards the full identification between thought and language, the priority lies with the German psychologist F. Max Müller: "Language and thought are indistinguishable… Thinking is speaking in a low voice, and speaking is thinking aloud" (1891, I, 526).

[21] Both *Purposive Behaviour in Animals and Men* (Tolman 1932) and *The Behaviour of Organisms* (Skinner 1938) are *exclusively* based on results of experiments on guinea pigs. Such impudent extrapolations have been criticized, among others, by

Verplanck (1954) and Berlyne (1964). As regards humans properly, behaviourist students of language have conducted experiments on rote learning of nonsense syllables and similar stuff, in conformity with "the behaviourists' disregard and fear of complex cognitive activities" (Legrenzi 1983, 386; also see Weimer and Palermo 1973/1979, 251-2). No wonder that, following this path, the most assertive member of that school venture to maintain that "the self is nothing but a repository of responses appropriate to given sets of circumstances" and that the idea of man's free will "only depends on our ignorance; it helps us explaining what presently we are not able to explain otherwise;" it is a mystical and metaphysical stance that "loses credibility at every progress of our knowledge about human behaviour", and will end up being banned from science (Skinner 1971, 189, 12 and *passim)*.

[22] The same opinion has been expressed by Giovanni Boniolo: "Referents are directly linked with their mental representations and only indirectly with the linguistic one" (1999, 297).

[23] In the first volume of his *Categories* Aristotle showed full awareness of the situation, and called homonyms the former (one term ⇒ many concepts) and synonyms the latter (one concept ⇒ many terms).

[24] A program far more ambitious than Confucius', who restrained himself to advocating "a rectification of terms."

[25] This is the reason why the later Wittgenstein found "just a family resemblance" between the various meanings of a term (1953, *passim*).

[26] In the best known of those "experiments," a student was instructed to park her/his car in the parking place reserved for a faculty member, and to hide her/himself nearby in order to turn up when the professor arrived and looked around for the breaker of the university rules. The professor would probably say: "This parking place is reserved for faculty members", and the student was instructed to ask for a definition of each term uttered: "What do you mean by parking place?" "What do you mean by reserved for?" "What do you mean by faculty members?" and then ask for a definition of each term the professor used in her/his definitions. Sooner or later the professor would either assail the student or turn her/his back on her/him and run away. By "experiments" like this Garfinkel aimed at showing that daily life flows with relatively few such obstacles only thanks to the assumption mentioned in the text.

[27] Particularly able in this exercise ("axiomatization") have been Euclid, Hilbert (1899), Russell and Whitehead (1910-13).

[28] See Smoke (1932); Castelfranchi (1975); Marradi and Fobert Veutro (2001); Fazzi (2006).

[29] For Bachelard's so-called *coupure épistemologique* see any if his important works (e.g., 1934; 1940).

[30] E.g., Whewell (1840); Smelser (1976); Sartori (1984).

[31] See Marradi (1989).

[32] By 'meta-term' it is usually intended a term that does not directly refers to the objects of a field, but is more abstract and has syntactic functions. In Marradi (1994) I listed above fifty terms and meta-terms with the related authors denouncing their polivocity.

[33] E.g., Sartori, Riggs and Teune (1975); Riggs (1979).

[34] The overstatement of the influence of language on thought is not a characteristic of linguists only. Consider e.g., a political scientist: "Thinking in silence is a final achievement, to which man arrives insofar as educated by dialogue, by communication. Children are taught to think by talking to them. Language and communication form in us the ability to think… If we learn to think by words, we will continue to think by means of words" (Sartori 1979, 25).

[35] The German proto-romantic Schlegel (1795) maintained that the main function of language was helping to form thoughts, not to communicate them.

[36] I asked several times my postgraduate students both in Italy and in Argentina to perform that exercise by writing down definitions of terms both related to a physical referent always present in my classes (a projector) and to several terms with non-physical referents (such as fear, intelligence, etc). Over hundreds of definitions given only a minimal percentage (less than 1%) were exactly equal, and a small percentage (6-7%) could be judged similar. There was little more coherence (5% equal and 16% similar) between definitions given by the same student at a month's distance.

[37] John Langshaw Austin has analyzed (1961, 71) with his well-known subtlety one of those processes, relative to the term 'healthy'.

[38] For instance, the familiar image of the extraction of numbers in lotto or bingo is likely to have reduced the proliferation of meanings of the expression 'random sample.' On the contrary, the lack of analogous typical images has favoured the proliferation of meanings, and as a consequence the ex-

treme ambiguity, of the expression 'representative sample' as used by polling firms.

[39] At least initially: then the autonomous life of language inevitably produces a certain plurality of more or less similar meanings.

[40] Several decades of ridiculous "experiments" by behaviourists who set pigeons and guinea pigs in highly artificial and awful situations in order to show that they behaved like Descartes' automata have been buried under mountains of contrary evidence when animals are observed unobtrusively in their natural environment. The literature on the topic is endless: suffice it to quote Mainardi (*ed.*, 1992); Inoue and Matsuzawa (2007).

[41] While in Sapir's works it is hardly central; it is several times expressed more cautiously that in the two passages quoted above, and is openly contradicted by numerous instances reported by Sapir himself. Moreover, the "Sapir-Whorf hypothesis" is not even mentioned in the presentations of three fundamental works by Sapir: the collection of his essays (1949) edited by David G. Mandelbaum, the Italian translation of *Language* (1921) edited by Paolo Valesio (Torino, Einaudi 1969), and the Italian collection of essays by Sapir edited by Giulio C. Lepschy (Torino, Einaudi 1972).

[42] Consider two frequently quoted passages of Whorf's, comparing them with the two passages by Sapir quoted above: "The linguistic system is a molder of ideas, a programme and a guide for an individual's mental activity... We section nature along lines drawn by our mother tongues... The world appears to our minds as a chaotic flow of impressions that must be organized by a linguistic system" (Whorf 1952, 5). "We section and organize the flow of events in the way we do because in our mother tongue we have agreed to do so, not because nature offers itself to our looks already subdivided in that way" (Whorf 1956/1970, 158).

[43] Similar but somehow more cautious statements by Cassirer (1923-29), Mounin (1963), Kuhn (1970), Shi-ze (1993) and many others.

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