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Husserl's *Lebenswelt* and the problem of spatial cognition—in search of universals

Elżbieta Łukasiewicz
Kazimierz Wielki University in Bydgoszcz

Abstract. Perception and conceptualization of space are some of the most basic elements of human cognition. It has been long assumed that human spatial thinking and frames of reference used to grasp and describe the location of an object in relation to other objects are of universal nature and so are projected in natural languages in basically the same manner; three principal dimensions in egocentric perceptual space were distinguished: up-down, front-back and left-right, reflecting our biological make-up. If differences in spatial terminology were observed, they were relegated to surface structure phenomena, but were not regarded as differences in perceptual and conceptual representations in the human mind. That belief in the universal perception of spatial relations among humans was of considerable importance for some philosophical theories, also for Husserl's conception of the *Lebenswelt a priori* and his defence of the validity of scientific propositions and of absolute truth. It now appears that the extent of the diversity in spatial thinking has been drastically underestimated (Levinson 2003), but it does not follow that Husserl's intuitions regarding the existence of universal constituents in incompatible *Lebenswelt* experiences were necessarily wrong.

Introduction

The aim of this article is to consider the question of universality of human spatial thinking and how it bears upon Husserl's conception of universal constituents of different *Lebenswelt* experiences. In the first part, we will present some ideas concerning absolute and relative space, and how the latter dominated our reasoning about movement and the location of objects, as well as our spatial terminology, to the effect that the six egocentric directions of up-down, front-back, and left-right, so closely bound up with the human body, came to be regarded as universals of spatial cognition. The idea that we see spatial relations in basically the same way, although rooted in the characteristics of just a handful of Indo-European languages, has long prevailed in Western thinking, with far-reaching consequences for many philosophical theories, in particular for the theory of knowledge.

Universal perception of space was especially important for Husserl's defence of the validity of scientific propositions and of absolute truth. In his relativistic theory of incompatible life-worlds (*Lebenswelten*), in which we are entrapped and where we can formulate truths limited in their validity to a particular life-world only, the existence of a few (not many!) universal constituents of our different *Lebenswelt* experiences (such as the universal perception of space) provides us with a foundation for formulating objectively true scientific propositions. Husserl's theory of the *Lebenswelt* and its unwelcome, relativistic consequences, as well as his concept of a universal *Lebenswelt a priori* will be presented in the second part of the paper.

Next, in part three, we will concentrate on some anthropological investigations concerned with spatial terminology, frames of reference, and spatial thinking in non-Western cultures that have called into question the existence of universal perception of spatial relations. Not only can we observe a remarkable diversity in how various languages express spatial relations, but differences in spatial language have far-reaching cognitive effects; people speaking a language with a predominant absolute frame of reference will also use that frame of reference in their non-verbal cognition, and consequently, they will see spatial relations in a way markedly different from ours.

If spatial language and spatial cognition are so vastly different, does that mean that Husserl's universal constituents of *Lebenswelt* experience and, generally, the 'mental unity of humankind' are untenable concepts? In part four, we will consider Levinson's idea as to how a far-reaching linguistic determinism (neo-Whorfianism) might be reconciled with the existence of a set of cognitive universals independent of language influence, and how that refers to Husserl's idea of a common *Lebenswelt a priori*.

1. Space and cognition—a historical perspective

How we perceive and conceptualize space is of essential importance to our understanding of this world. Our ability to see and locate objects and ourselves in space, i.e. our spatial cognition, consists of many different constituent abilities,[1] from recognizing the dimensions of an object, say, a

[1] According to Levinson (2003, Chap. 7.1), we are endowed with a vast inventory of spatial representation systems responsible for spatial processing, such as propositional representations, geometrical representations, abstract mental models, dead reckoning systems, mental maps, haptic-kinaesthetic representations, visual imagery, and visual representations proper to enumerate only the major ones, which most probably form a multi-layered complex in which there are many further internal layers of processing; those multi-layered systems cooperate and 'translate'

computer keyboard, to controlling the movements of fingers when pressing particular keys, to realizing the location of the body and the computer in relation to the rest of the room and to the outside world. A thorough discussion of the concepts of space and theories of its perception is beyond the scope of the present paper; we will rather concentrate on the notion of frame of reference, which enables us to express the idea that an object *a* is in some specific direction from a landmark or object *b*.

It is important to mention and keep in mind that there are different modalities of spatial cognition; hence, in visual perception, in language, and in body movement we use slightly different frames of reference. However, for the purposes of the article we will disregard the so called Molyneux's problem of how spatial information is translated from one modality to another and assume an oversimplified picture, namely, that there is a system responsible for spatial cognition 'in total,' which collects inputs from different sensory modalities and generates instructions readable to various output systems. It seems to be a fairly harmless oversimplification; translatability is a fact—otherwise we would not be able to touch or describe the objects we can see.

Perhaps the oldest in the literature is the distinction between absolute and relative frames of reference. Aristotle wrote in *Physics, Book 4* that there are six dimensions in space: *above, below, ahead, behind, left and right,* which are in relation to our position. As he referred the directions of 'up' and 'down' also to nature, to celestial spheres and to the centre of the earth respectively, we may say that he used two types of frames of reference: relative and absolute. Absolute and relative types of space are also found in Newton's *Principiae*. The former is immovable, abstract, not related to anything external to it and inaccessible to our senses, whereas the latter one is psychologically 'real,' it is movable, occupied by physical objects and specified by their relations to one another. The Newtonian absolute space was refuted by Leibniz as an irrelevant metaphysical concept—to him space was the locations of objects with respect to other things. When we ascribe motion to one object rather than to its reference point, i.e. its surroundings, it is our choice, we could have done it the other way around equally well—the Leibnizian space is definitely relative.

Quite early on the concept of relative space was assumed to have psychological primacy, and was considered to be the foundation of our commonsensical reasoning about location and movement, as well as of our spatial language. At the same time, relative space became strongly connected with some egocentric and anthropomorphic features—it acquired

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their representations into inner languages readable to other systems, without the need for one single, central representation system.

coordinate systems originating within the subjective body of the ego; whereas absolute space became associated with non-egocentric features.

Spatial cognition (animal and human) has been the focus of interest for many sciences: ethology, neurology, psychology, social anthropology, philosophy, linguistics, and there has grown enormous literature on the subject. But one thing was taken for granted and hardly ever questioned, namely that space as a system of axes is necessarily referred to the human body, and that spatial coordinates use the planes through the human body to give us up-down, left-right, and back-front. No one really questioned Aristotle's six principal dimensions in spatial cognition that are relative to the human observer; human spatial thinking has been considered egocentric, anthropomorphic and relative, not absolute (Cf. Miller & Johnson-Laird, 1976, pp. 380-395). Egocentric spatial vocabulary found in most languages was regarded as evidence for our egocentric and relativistic spatial concepts. Let us quote Lyons in that respect:

> Looked at from one point of view, man is merely a middle-sized physical object. But in man's world—the world as man sees it and describes it in everyday language—he is, in the most literal sense, the measure of all things. Anthropocentrism and anthropomorphism are woven into the very fabric of his language: it reflects his biological make-up, his natural terrestrial habitat, his mode of locomotion, and even the shape and properties of his body. (Lyons, 1977, p. 690)

Because we live and move on the surface of the earth, normally in the upright position, with the sky above us and the ground beneath, our bodies are asymmetrical in the vertical dimension and we experience the effects of the force of gravity, argues Lyons. This gives us the means of identifying the up-down dimension in a three-dimensional space. It also gives us a fixed zero-point at the ground level. The difference between upwards and downwards is physically and psychologically the most important of the spatial dimensions. Next, there are two horizontal dimensions, asymmetrical front-back and symmetrical right-left, neither of which is fixed like verticality is by the force of gravity. In the up-down, front-back, and, to a lesser degree, right-left dimensions we observe not only directionality, but also polarity. Objects located above the ground and in front of us are visible and accessible, while those under the ground or behind us are not. "In an egocentric perceptual and interactional space based on the notions of visibility and confrontation," as Lyons put it, the notions 'up' and 'front' are positive, whereas 'down' and 'back' are negative. We would like to add that the predominance of right-handedness among humans gives polarity and markedness also to the right-left dimension; what is 'right' usually bears decidedly more positive connotations than 'left.' Lyons continues by saying that

> It has been plausibly argued that polarity and markedness in pairs of directional opposites derive, not only in the vocabulary of location and locomotion, but more generally, from the natural properties of the ego-centric perceptual space and the spatial orientation and physical asymmetries of the human body. (Lyons, 1977, p. 691)

The emphasis on egocentric spatial cognition has been particularly prominent in child development studies and behaviourist psychology. Psychologists claim that ego is the first spatial relatum we learn, and it requires considerable amount of learning for a child to get out of that exclusively egocentric space; however, it does not mean that egocentric space is abandoned—it is rather supplemented.[2]

Why is the idea of universality in human spatial cognition so important? As we will show in the following section, it is relevant to the theory of knowledge, and ultimately, to the problem of absolute truth and of the validity of scientific propositions. This brings us to Husserl's theory of the *Lebenswelt* and his problem with absolute truth.

2. Husserl's theory of the *Lebenswelt* and problems with the truth—on the importance of universality in spatial cognition

The notion of *Lebenswelt* first appears in Husserl's *Ideen II/XIII* in 1917.[3] This marks a turning point in his philosophy; in the earlier *Logical Investigations* Husserl defended the absolute theory of truth, whereas the theory of the *Lebenswelt* (also called *personale Umwelt, natürlicher Weltbegriff, Alltagswelt*) had apparently relativistic consequences. That relativism was somewhat unwelcome and we will try to show how Husserl tried to overcome the problem, to which end it was necessary to assume the universality of human spatial cognition.

Let us first define what *Lebenswelt*, or life-world, is. It is the spatio-temporal world we experience before transcendental reduction, the world we live in and to which we have a personal, or natural, approach. It is our world with people and products of human culture; importantly, this world does not consist of pure *sensibilia*—it is a world with objects as we experience them, not with natural qualities of objects only, like colour, shape, etc. This world might simply be called the world of our culture.

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[2] For views on the child's conception of space see Piaget & Inhelder (1956), Clark (1973).

[3] More details concerning the history of the notion are to be found in Łukasiewicz D. (2005), see also Soffer (1991, Chap. 5). It was already in *Ideen I* that Husserl used the notion of *natürliche Welt* whose meaning covered what was later called *Lebenswelt*. The very notion of *Lebenswelt* can also be found in Rudolf Eucken's work *Erkennen und Erleben* (1912).

Apart from the life-world, there is the mathematical world, which is subject to scientific description. When we process, analyse, abstract and mathematicize the data given to us in the *Lebenswelt* experience, we come to what we might call scientific cognition. It is essential that the life-world, the world of our personal everyday experience, is primary in relation to the mathematical world.[4] The latter is founded on the former; if our *Lebenswelt* experiences were different, the world described by mathematical and natural sciences would be different as well.

The consequences of that 'foundation' thesis, i.e. that sciences are founded, or based on the *Lebenswelt* experience, are far-reaching indeed, particularly for the theory of truth. Since we experience our everyday world in a way different from that of people from other cultures, there are many incompatible *Lebenswelt* experiences. Our life-world is different to the life-world of the Tukano or Bwende tribes. Therefore, what is true in our life-world is neither true nor false in their life-world. Husserl dubbed such truth *Situationswahrheit*—occasional truth. Let us remember that in the theory of absolute truth it is not possible for one and the same proposition to be once true and, on another occasion, false, or neither true nor false. In the theory of the *Lebenswelt*, a proposition which is true in a particular *Lebenswelt* is true in that *Lebenswelt* only, in another it is neither true nor false.

If we combine the three assertions: first, that there are many different life-worlds; second, that a proposition is true or false with respect to a particular life-world, and, third, that natural sciences are founded on *Lebenswelt* experience, we come to a conclusion that scientific truths are relative, they are true in one life-world only—the one in which the scientific research is carried out. Thus, mathematical propositions, physical theses, natural laws, etc., which have been formulated in our culture are true and valid in our life-world only.

That was obviously a problem for Husserl. He chose to defend absolute truth and the universal validity of scientific propositions by focusing on universal constituents of different *Lebenswelt* experiences. Those universal constituents are our perception of time, space and objects. We might call them *Lebenswelt a priori*. Hence, as we can see, the universality of human

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[4] In *The Crisis of European Sciences* Husserl writes: "The knowledge of the objective-scientific world is "grounded" in the self-evidence of the life-world. The latter is pregiven to the scientific worker, or the working community, as ground; yet, as they build upon this, what is built is something new, something different. […] The concrete life-world, then, is the grounding soil [*der gündende Boden*] of the "scientifically true" world and at the same time encompasses it in its own universal concreteness" (1970 [1936], pp. 130-131).

spatial thinking, if we take that particular constituent into account, is a condition of saving the validity of sciences and scientific truths.

However, at this point we have to add that such a generally formulated conception of a *Lebenswelt a priori* includes a couple of vague points—what exactly constitutes that *a priori* as far as spatial cognition is concerned?

First of all, the very notion of *Lebenswelt a priori* can be interpreted in two ways: in its epistemic or its ontological sense. The epistemic interpretation would assume that our perceiving of space is universal, or involves some universal epistemic constituents; the ontological interpretation of the notion would focus on the universal features of what we perceive as space. These two interpretations can be combined, and then the concept of the *Lebenswelt a priori* would involve a universally structured perception act in which we perceive universal and invariant constituents of space.

Another thing is the relation between what is relative and contingent and what is universal and necessary in our spatial cognition, or, to put it another way, the relation between our changeable *Lebenswelt* experience of space on the one hand, and the invariant spatial *a priori* on the other. We might put forward some possible interpretations of what could be meant by the *Lebenswelt* spatial *a priori*:[5]

(1) all cultures use a system of spatial orientation with some spatial predicates (but the characteristics of those predicates are not set explicitly)
(2) all cultures use the same system of spatial orientation, with the same six dimensions of up and down, back and front, left and right
(3) all cultures use a system of spatial orientation with some spatial predicates, which is based on a set of spatial universals, but not reducible to it
(4) all cultures use a system of spatial orientation with some spatial predicates, which is not based on a common set of spatial universals, but those different sets of spatial predicates used in different Lebenswelt experiences are translatable into one system of spatial orientation (the one used in modern science)

On numerous occasions did Husserl refer to the process of cognizing in space, though he did not elaborate the topic specifically in the context of the *Lebenswelt a priori*. In *Zur Phänomenologie der Intersubjektivität* (1973 [1905-1920], §2), he writes that whatever is not the body appears as

[5] Such possible interpretations of the *Lebenswelt a priori* have been suggested by a referee of the present paper, special appreciation is due to both anonymous referees for their helpful comments.

necessarily related to the body and has some spatial orientation (consciously perceived by ego) of being to the right, to the left, in front of or behind in relation to ego. Then, in §5, Husserl continues that every ego distinguishes an objective space from the phenomenon of space as appearing to us through 'here' and 'there,' 'in front of' and 'behind,' 'on the left' and 'on the right.' Each of us is surrounded by the same world and the same things, but everybody grasps these phenomena in his/her own way depending on their location in space. Every object has its front and back, its up and down. What is the front of an object to me is the back of it to someone else, but it is nevertheless the same object with the same set of features. Again, in (1917, §41a), Husserl writes that we inescapably perceive things in some spatial orientation. Things always appear on one side or another, and in that manner of their appearance we find the intrinsic, irremovable feature of their being related to some 'here,' which is the fixed zero point for the three dimensions. Husserl states explicitly that every spatial object appears as located up or down, to the left or to the right in relation to ego. Similar claims are to be found in *Cartesian Meditations*, §54.

Taking the above statements into consideration, we could suggest the following interpretations of what constitutes Husserl's life-world spatial *a priori*.

There is one, common to all humans, system of spatial orientation, operating with the relative frame of reference, which is part of our cognitive endowment—we might call it an epistemic *a priori*; and there is one objective space—an ontological *a priori*—graspable by means of the aforementioned system of spatial cognition. This interpretation corresponds to (2) above. Universal validity of mathematical truths could be grounded in that objective epistemic and ontological spatial *a priori*. In his works directly connected with the concept of the *Lebenswelt a priori* (*The Crisis of European Sciences…, The Origin of Geometry*), Husserl did not describe the exact nature of spatial experience.[6] So we might conclude that although he did not elaborate the theme, he regarded the epistemic *a priori* as the

[6] "If we seek out, simply looking around us, what is formal and general, what remains invariant in the life-world throughout all alterations of the relative, we involuntarily stop at what alone determines for us in life the sense of talking about the world: the world is the universe of things, which are distributed within the world-form of space-time and are "positional" in two senses (according to spatial position and temporal position)—the spatiotemporal *onta.* Here would thus be found the task of a life-world ontology, understood as a concretely general doctrine of essence for these *onta.* For our interest in the present context it suffices to have indicated this. Rather than spend our time here, we prefer to move on to a task which is much greater, as will soon be seen—one which in fact encompasses such a doctrine" (Husserl 1970 [1936], p. 140).

relative frame of reference, and the ontological a priori as the objective space, in accordance with his numerous statements elsewhere.

We might also draw a weaker conclusion, namely that Husserl did not specify the nature of that spatial *a priori*, and what he meant was the sheer fact that all cultures use a system of spatial orientation of some kind, with some spatial predicates (but these may have nothing in common); see (1) above. That interpretation of the spatial *a priori* would be slightly bland, and not very helpful in saving the objective validity of natural sciences.

Another possible interpretation could be the following: there are different incompatible systems of spatial (and temporal) orientation, and they may be untranslatable into one another, but all of them are used in relation to the same objective spatiotemporality. Thus, ontological *a priori* would be the ground to support scientific truths; there are different, incommensurable spatial predicates grounded in different life-worlds, but they refer to one and the same space, which can be described mathematically; see (4) above.

The problem with interpretations (1) and (4) is that, most probably, Husserl did not have any anthropological research data showing that there are indeed vastly incompatible systems of spatial cognition. So taking his earlier writings into account, it is more justified to conclude that Husserl was rather of the opinion that we all use one system of spatial orientation with the relative frame of reference to locate objects in one objective space.

Indeed, in view of the long-prevailing theory that the nature of our spatial cognition is universal, it would appear to be a sound solution; because humans see spatial relations in basically the same way, this can be regarded as a universal constituent of our cognition. However, the belief in the existence of a universal, invariable structure in variable *Lebenswelt* experiences has not been supported by anthropology or by other sciences. Just the opposite, anthropological research has revealed that perception and cognition of space among human populations can be markedly different. Naturally, it might be counter-argued here, much in the spirit of the *Lebenswelt* theory, that the truths of anthropology are relative themselves and limited to the *Lebenswelt* in which the anthropological research is carried out, but this would not help us save the absolute validity of scientific truths.

As we shall see in the next part, there are languages and cultures where generalizations about the universally egocentric spatial thinking and Aristotle's six directions bound up with the human body are not justified. This goes somehow counter to the views on spatial cognition predominant throughout more than two thousand years of Western thought, but the truth is that some philosophical ideas were founded on the concepts of naïve, commonsensical thinking enshrined in just a few Indo-European languages. In many natural languages it is not possible to express the concepts *I must*

turn left now or *I put my keys to the right of the vase*, which are so obvious to us. Those languages do not have the linguistic resources to express the Aristotelian relative and egocentric frame of reference equivalent to the English *left/ right of*. The consequence of that fact must be either that speakers of those languages think differently about space, or that they think about space in basically the same way as speakers of English do, but thinking and speaking are markedly dissociated. To the problem of the relation between language and thought we shall return in part 4.

3. Non-relative, absolute spatial cognition in non-Western cultures

In order to grasp the incompatibility of the resources of natural languages codifying spatial relations, let us first return to and consider in more detail the notion of frame of reference. The phrase itself comes from *Gestalt* psychology of perception from the 1920s and refers to the way we account for the location or motion of an object in relation to either its coordinate systems or another object (reference object, relatum). In the literature on perception theory we may find various distinctions concerning the notion: 'relative' vs. 'absolute'; 'egocentric' vs. 'allocentric'; 'subjective' vs. 'objective'; 'viewer-centred' vs. 'object-centred'; 'orientation-bound' vs. 'orientation-free'; for the purposes of the article we will concentrate on three linguistic types of frames of reference: the intrinsic, the relative and the absolute. Those three types are distinguished on the basis of lexical resources available in natural languages for locating objects in space, and are illustrated by the following English sentences respectively (as all the three types are available in English):

(1) The pen is lying in front of the TV.
(2) The ball is behind the tree.
(3) Our camp is north of the town.

Thus, the intrinsic type (1) involves an object-centred coordinate system; coordinates are determined by the qualities of the reference object, in our culture they usually refer to the functional features of the object, here 'the front of the TV' is the part we pay attention to when watching it. The relative frame of reference (2) requires an observer situated at a particular viewpoint plus an object and ground distinct from it. When we say that the ball (object) is behind the tree (ground), we mean that it is there from a particular viewpoint (ours). The third type, the absolute frame of reference, involves cardinal directions provided by gravity (the vertical plane) or the polar system (the horizontal plane); or it may also involve other arbitrary but fixed bearings, like a central mountain, a rock, a stream or another local feature known to all community members.

The three frames of reference can be combined, as in many Indo-European languages, or there may be only one type or two in a language.[7] But even if all three types co-occur in a language, not all of them are equally important. A sentence '*The tyre is lying north of the car*' would sound highly exotic to us, although the message is quite precise, and, in many languages using the absolute frame of reference is a natural way of locating objects.

Let us turn now to a research project on spatial thinking and frames of reference carried out by Levinson and his colleagues (Cf. Levinson, 2003), involving experiments on spatial cognition with subjects from different cultures across the world and an examination of spatial terminology in more than fifty different languages. Without going into the methodological details of Levinson's experiments, we shall try to sketch briefly the major points of his research.

His argument goes that, first, there are numerous languages that do not use the bodily coordinates to construct a relative frame of reference (those languages lack expressions for Aristotle's six directions in space), and, second, connected with the first, there are aspects of non-linguistic behaviour observed among users of those languages that reveal deep cognitive differences among humans. The strategy Levinson uses is the following: first, he looks at differences in the linguistic coding of spatial relations in various languages and sorts languages into types *L1, L2, L3,...* on the basis of those differences; second, using independent, behavioural techniques and non-verbal experiments, he examines the non-verbal behaviour concerned with perception of spatial relations by speakers of *L1, L2, L3* respectively. The second step is crucial: the point is to examine whether speakers of *L1, L2, L3* perceive and conceptualize space differently *without* referring to those languages and their spatial terminology; or, in other words, to see whether the differences are indeed in cognition, and not just in language.

In one set of experiments, to give an example, the subjects were shown a set of three objects arranged in some order on a table, then the subjects were rotated 180 degrees, and asked to arrange another identical set of objects in

[7] With the implication that where a relative frame of reference is to be found, there is also an intrinsic one (Levinson, 2003, p. 314). Very often the intrinsic and the relative frames of reference actually compete. Notice, for example, the ambiguity of the English sentence '*The cathedral is behind the town-hall*,' where two frames of reference may be involved: intrinsic—'behind the town-hall' means in the space adjacent to the back side of the town-hall, i.e. the side opposite the main entrance; or relative—the town-hall (we disregard the fact that it has its distinctive parts: front, back and treat it like a tree) is situated between the observer (us) and the cathedral.

the same order on another table. The subjects operating with the absolute frame of reference maintained the north/south cardinal directions of the arrangement. Thus, when they completed the task, the objects that had been on their right side in the first arrangement were (due to the 180 degree rotation) on their left in the second arrangement. Those subjects ignored the relative left/right distinctions and focused on the cardinal north/south ones. By contrast, the subjects using the relative frame of reference ignored the cardinal directions and the fact that they had been rotated, and arranged the objects in the same position relative to themselves; what had been on their right was placed on their right in the second arrangement, what had been on their left was kept on the left. Such non-verbal tasks revealed—without anything being said—different conceptual categorization of spatial scenes in speakers of *L1, L2, L3* resulting from differences in the underlying spatial coordinate systems (Cf. Levinson, 2003, pp. 155-167).

As shown by those experiments, the opposition between various types of frames of reference available in particular languages appears to have deep consequences for non-linguistic, cognitive behaviour of speakers of those languages. What is more, it is not possible for human spatial cognition to translate a representation in a relative frame of reference into a representation in an absolute frame of reference, and the other way round—these two are incommensurable. Once our language has imposed on our spatial thinking one of those frames of reference, our memory and reasoning are 'tuned' into using that frame: if we normally see the location of objects in a relative reference frame, so that "the cup is to the right of the computer," we will not be able to switch into the absolute frame of reference and see that cup as located, say, "to the south of the computer."

The predominant frame of reference permeates other, non-linguistic, aspects of spatial cognition: from recognition, constructive recall, and logical inference to gesture, navigation and others. To illustrate this point, let us quote two of Levinson's examples of spatial thinking markedly different from ours:

- a Guugu Yimithirr (Australia) speaker providing information where a product was to be found in a shop located 45 km away gestured to his right side. What he meant, however, was not that the product was to the right side of someone entering the store, as we would understand the message, but that it was in the north-eastern part of that shop. Since he gestured north-east, he expected his interlocutor to remember the direction and look into the north-eastern corner of the shop when looking for the product.

- another speaker of that language when talking about a man living in the neighbourhood pointed directly at himself, but, in fact, he did not mean any relation to himself. What he meant was the south-east direction, where his neighbour lived, and to which direction he happened to be turned back

at that moment—he pointed at the direction through his body as if it was not there.[8]

The above examples come from a language with only the absolute frame of reference. That type of spatial language is particularly interesting as it requires the speaker to constantly maintain and 'update' their orientation with respect to the fixed directions. Users of the absolute frame of reference have to draw accurate and constantly updated mental maps to know their location and their direction with respect to some fixed bearings. In order to speak about the world, to be able to locate things in space, and, generally, to speak the language, the mental compass in the head of the speaker has to work at all times. Users of such languages typically possess quite remarkable navigational skills, unavailable to users of the relative frame of reference, who are generally unable to point accurately to places they cannot see. Although unusual for us, the absolute frame of reference is nothing limited to a few exotic tribes and environments; just the opposite—it can be found in all types of natural environments, from open desert to closed rainforest, in many different parts of the world, ranging from Mesoamerica to New Guinea, perhaps in as many as a third of all languages.

To sum up, Levinson opts for the thesis that our spatial cognition is heavily influenced by our culture, and in particular by our language. Languages significantly different in that respect mean significantly different perception and conceptualization of space and spatial relations. By this, of course, he subscribes to the Sapir-Whorf hypothesis of linguistic relativity, in its weaker version at least. That outcome may appear rather unexpected, since the domain of spatial cognition long seemed an unlikely place to find support for Whorfian theses. Because of its necessity and importance to our species, spatial thinking, not only for Husserl but also for many before and after him, seemed to be a good candidate for a cognitive universal, possibly innate and developed early in the mind of human species. That does not seem to be the case.

4. Levinson's theory of dual-level mental processing, Husserl's *Lebenswelt a priori* revisited, eidetic reduction—in search of cognitive universals. Concluding remarks

Since natural languages differ remarkably in the resources they posses to render spatial relations and since, in view of Levinson's investigations, humans differ in their thinking about space, does that mean that the

[8] For more examples see Levinson (2003, pp. 4-5, 112-145, 216-277).

cognitive unity of mankind and common *Lebenswelt a priori* are untenable? It might seem so, but the ultimate answer depends largely on how we see the relation between language and thought, i.e. the relation between semantic representations and conceptual representations.

To many the relation between categories of language and categories of thought is very close, almost equivalent. Thus, via a natural language, like English, we gain an insight into the workings of the mind. There are no semantic representations that would be different from conceptual representations, although, significantly, the latter are much more numerous than semantic representations and they are primary. Let us quote Pinker to illustrate the point (1994, p. 82): "Knowing a language, then, is knowing how to translate mentalese into strings of words and vice versa." Indeed, for many cognitive scientists (Cf. Fodor, 1975) semantic representations reflect universal cognitive categories/representations present in the mind; when we learn a language we map words of that language on pre-existent concepts.

According to Levinson, semantic representations are not to be understood as equivalent to conceptual representations in which we think; they are related and similar, but there is no one-to-one mapping—we do not think in the same kind of categories in which we speak.[9] However, the efficiency with which language is encoded and decoded and its general learnability point to at least some partial isomorphism and closeness between semantic and conceptual representations. What is more, if there are serious constraints on the linguistic output, such as, for example, that a given language should code spatial relations using the absolute reference frame, the rest of the cognitive system has to support such an output and work effectively towards that particular goal, in this case it has to incessantly compute directions. Hence, it is reasonable to assume that conceptual representations are closely related to semantic ones.

If that correspondence is a fact and natural languages differ remarkably in their resources to render spatial relations (as well as colour, kinship, biological categories, etc.—to mention only some would-be semantic

[9] If that equivalence obtained, Levinson argues, we would expect natural languages to have quite similar lexical resources to render all semantic categories, which does not happen. Even in the domains where we would expect to find some linguistic universals, like kin terminology or colour terms we come across vast discrepancies. There are languages which lack words or constructions for the logical connective *if* (Guugu Yimithirr) or temporal connectives *before, after* (Yucatec)—examples could be multiplied. Secondly, whatever we say/hear and whatever the length and precision of the utterance, we always mean/understand far more than is actually said, thus semantic representations are more like a subset of conceptual representations (2003, pp. 292-296).

universals), does that mean that conceptual representations in the minds of their speakers are different as well?

Sapir, Whorf and other adherents of the linguistic relativity principle would answer that, indeed, semantic representations are different and, consequently, conceptual representations are different. We think in different ways depending on the language we speak; let us quote Whorf himself on that issue:

> […] the background linguistic system (in other words, the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper of ideas, the program and guide for the individual's mental activity, for his analysis of impressions, for his synthesis of his mental stock in trade. Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar, and differs, from slightly to greatly, between different grammars. We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds—and this means largely by the linguistic systems in our minds. (1956, pp. 212-213)

But we do not have to fall into strong Whorfianism if we assume a close correspondence between semantic and conceptual representations. First, we may adopt the already mentioned nativist approach, which is, in fact, quite remote from the linguistic relativity principle. Within this approach natural languages differ because they make use of only some part of the vast resources of innate conceptual/semantic representations present already in the mind (those representations are triggered in language acquisition), but the basic mental unity of humankind is not thus repudiated; we are endowed with the same (enormous) set of conceptual/semantic representations (Cf. Fodor, 1975). A major weakness of this approach is that one has to assume that any lexical concept ever expressed in any natural language is part of universal human mental endowment, and, importantly, the concept is 'ready-made' there, as if waiting to be activated; it is not constructed under the influence of some external experience. It does not seem to be the way we learn new words and concepts, hence the approach is not really attractive.

Second, languages may differ in their surface semantic structures, but the underlying set of semantic (and conceptual) representations can be the same (Cf. Jackendoff, 1983; 1992, lexical decomposition theory). We are (innately or through learning) equipped with a set of semantic primitives, or primes, by means of which we build more complex semantic concepts in our languages, therefore word meanings may be conceived as decomposable into features (by contrast to the previous, holistic approach, where semantic concepts are non-decomposable). Those semantic primitives correspond to the primitives of conceptual structure, and thus we

may maintain that humans think in basically the same way. Semantic diversity across languages, the fact that languages have expressions with incompatible semantic contents, is a matter of different compositions of those universal lower-level semantic primes.

By contrast to the previous approach, decomposition theory has the big advantage of being able to account for the process of learning new concepts and new words. However, as Levinson pointed out (2003, p. 298), a serious counterargument to any theory based on the decomposition principle is the fact that the capacity of our working (short-term) memory[10] is strictly limited; our computational memory can operate on only up to seven chunks of information at a time, if not less.[11] Those chunks may have inner complexity, but they are processed as unitary wholes by our working memory. That is the reason why we are able to remember long numbers when they are divided into a few chunks, but we do not remember them in an undivided sequence. It would be a task far exceeding the working capacity of our short-term memory to process at a time tens of semantic primes constituting a single utterance, so it is more plausible that we do not decompose words, but operate on them as ready-made compounds.[12]

Since the mental storage capacity is a problem in an otherwise attractive theory, the solution Levinson suggests is dual-level mental processing (2003, pp. 298-301). There is a lower level where the decomposition into semantic primes can take place when we, for example, learn new words,

[10] Levinson in his argument equates working memory with short-term memory, according to other researchers, these two, though related, are distinguishable; the term 'working memory' refers to a four-component system of processes supporting the temporary storage and manipulation of information, whereas 'short-term memory' refers to processes that exploit the storage capacities of the working memory system but involve only minimal processing (for more on the distinction see Gathercole (2007, p. 758); the most influential model of working memory was first advanced by Baddeley and Hitch in (1974).

[11] Since G. Miller's influential article (1956) the limit on short-term memory was thought to be seven chunks of information, plus or minus two. N. Cowan (2001) claims that the real limit of our short-term memory is much lower, a mean memory capacity in adults is 3 to 5 chunks at one time. For example, this is the number of items we can recognize at a glance (subitize) without verbal counting; if we are presented for a quick glance with more than four items, say eight or nine, we cannot recognize without counting how many objects are in the group. The limitation of our short-term memory to only a few chunks at a time is in fact a constraint on how complex a single thought can be.

[12] In fact, language itself with its complex vocabulary rich in information seems to be such a useful packaging device compressing the innumerable conceptual primitive features into information-rich yet handy unitary chunks, convenient for short-term memory processing, and it may, as such, have offered our cognition an enormous advantage over the cognitive capacities of other inarticulate primates.

and a higher level at which we normally operate, where we process whole chunks of information without decomposing them. Thus, lexemes correspond to unitary concepts at the higher level, the level at which we observe semantic and, hence, conceptual diversity across languages, whereas universals are to be found at the lower level where the unitary concepts are decomposed into atomic primes. We normally think in high-level chunks: complex concepts packaged into single words, and thus our thinking reveals quite strong Whorfian effects—it is different depending on the semantic structure of a particular language. However, if needed, those unitary concepts can be broken into the lower-level atomic concepts (which may be innate or developed in the process of learning), where we are no longer the prisoners of our language.

At this point it has to be mentioned that Levinson's argument against the lexical decomposition theory, the argument, let us remember, based on the limited capacity of working (short-term) memory, will not go unquestioned. The problem of the role of working memory (and short-term memory) in the processing and comprehension of language is very much open to debate, some researchers claiming that although working memory does play a more direct role in supporting language learning, particularly in younger children[13], its role in processing sentences for meaning is insignificant because language processing operates on-line without recourse to what is stored in verbal short-term memory or working memory.[14] However, even if working memory is not substantially involved in language processing (which is a debatable view) and Levinson's argument against decomposition theory is not relevant, this does not invalidate his conception of dual-level mental processing. This solution has the advantage of accounting for the phenomenon of semantic and cognitive diversity across languages on the one hand, and, on the other, it does allow for some fundamental universals of human cognition.

In the final part of the paper, I would like to return to Husserl's *Lebenswelt* theory and consider how Levinson's solution might be related to Husserl's defence of the *Lebenswelt a priori*. Let us remember that Husserl's theory of different and incompatible life-worlds had strongly relativistic consequences—unwelcome, as they undermined the purpose of natural sciences and the concept of objective truth. To overcome the problem Husserl claimed that in our different and incompatible experiences,

[13] Cf. Gathercole (2007, pp. 761-766) on the strong association between short-term memory and native vocabulary scores at 4-5 years of age, as well as the relation between working memory functions and Specific Language Impairment (SLI).

[14] Cf. Gathercole (2007, pp. 758-760) on sentence processing and working memory. For an opposite view, i.e. that language comprehension must involve a short-term or working memory system see Waters and Caplan (2005).

determined by particular life-worlds, one may find some basic universal constituents, like the perception of space, time and objects—the so-called *Lebenswelt a priori*—and those universal and basic constituents of our experience are the foundation on which we can build objectively true scientific propositions. As mentioned in part 2 of the present paper, Husserl did not specify what exactly constitutes that spatial *a priori*, whether it is model (1), (2), or any other. Obviously, Levinson's empirical research and other such findings are relevant to Husserl's theory whatever interpretation of it we assume.

If Husserl's understanding of the *Lebenswelt a priori* corresponded to (2) above (i.e. that regardless of our particular life-world we use the same (relative) system of spatial orientation, with the six dimensions of up-down, back-front, left-right related to ego), which is a plausible interpretation in view of some of Husserl's declarations, then Levinson's findings clearly undermine the thesis of a universal spatial *a priori*.

But, on the other hand, the existence of different and incompatible systems of spatial orientation supports the *Lebenswelt* theory itself; we may say that Husserl was right indeed: there are many culturally, linguistically and cognitively different life-worlds. Husserl may not have had enough research data revealing the true extent of the diversity in the world's spatial orientation systems, but, if he had had the data, we may speculate, he would have welcomed them as strong support for his conception of the *Lebenswelt*. What is more, he could have defended the *Lebenswelt a priori* arguing—very much in the spirit of the descriptive phenomenology—that even though we use different and incommensurable spatial orientation systems, we perceive one and the same space (from different perspectives). The empirical research shows only that our perception and conceptualization of space are more diverse than Husserl assumed, and spatial predicates used in different cultures are apparently incommensurable, but it is still the same objective space. Furthermore, we cannot exclude the possibility that there is a way to translate those different incommensurable spatial predicates into one spatial orientation system, although in normal everyday processing of spatial information we do not do it. This would suggest model (4) as a possible interpretation of the *Lebenswelt a priori*. In this case, Levinson's solution of double-level mental processing with two levels of mental representations might be very supportive; the semantic/conceptual primes accessible to us on the lower level of mental processing would provide us with the much required epistemic *Lebenswelt a priori*, and the diverse spatial information grounded in different life-worlds would be translatable into those universal semantic/conceptual primes if need be. If we accept this approach, then contemporary linguistics provides us not only with the empirical data verifying Husserl's claims, but it also offers a theoretical solution of how to

save the validity of the *Lebenswelt a priori*, even though this solution is still a working hypothesis with many open questions.

Finally, it is worthy of note how Husserl himself tried to defend the theory of the *Lebenswelt* and the non-relativist conception of truth in his later works (1970 [1936]). He did not refer to empirical research at all. Instead, he employed a phenomenological method of eidetic analysis (ideation). In brief, ideation is a process in which the awareness we have of a particular object (or of a property, a state of affairs, an event—actual or imaginary) is transformed into an awareness of a universal or essence (*Wesen, Eidos, Essenz*). The eidetic procedure is the following: if we can imagine an object to be other than it is with respect to one of its parts or properties, *A*, without ceasing thereby to be that object, then *A* does not belong to the essence of that object. But, if a change of property *A* in the object imagined changes the object in question into a distinct object, then property *A* belongs to its essence.

The aim of eidetic reduction in our case would be to show that there are universal elements (perception of spatial relations, but also of time and objects) that belong to the essence of any life-world. As we can see, Husserl's defence of the *Lebenswelt* universals and the absolute truth depends to a large extent on how successful one is in carrying out the eidetic analysis. Naturally, we might raise objections that Husserl's defence of the *Lebenswelt* universal constituents relies on theory-internal arguments; in order to accept his solution, one has to accept certain preliminary assumptions of his phenomenology. Indeed, there were many objections to this solution; to many it seemed strange to gain an understanding of what the essence of an object is by imagining that object with properties it does not possess (for more on Husserl's ideation and objections to it see Bell 1990, pp. 193-197). However, I would like to point to some affinity between Husserl's solution and Levinson's conception of the dual-level mental processing.

According to Levinson, we normally think in high-level chunks, and those information-rich chunks are determined by the structure of our language. Therefore, our language strongly determines what we think and what we express in it. In the usual, rapid process of language production and comprehension we do not decompose those holistic high-level semantic representations into constituent features, however, at the lower level of our mental processing, such analysis into constituent features is available to us, if need be. Naturally, eidetic analysis is something different from lower-level decomposition into semantic primes, but, in its essence, it also involves decomposing an object into a set of properties. Thus, in both these theories the idea of decomposition is essential.

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