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Reason as Embodied, Metaphorical, and Imaginative

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Abstract

Studies in cognitive science provide three crucial empirical findings about the nature of the human mind. First is the inherently embodied nature of the mind. Second is predominantly unconscious nature of the human thought. Third is the principally metaphorical character of our abstract concepts. In a previous study, it was our intention to suggest the manner in which, when all is said and done, our power of abstract reason, under the framework proposed by proponents of imaginative reason, and reinforced by a host of thinkers sympathetic to their views, could well be identified with the human conceptualizing capacity. This has been found to involve three factors.The first factor is the power to create symbolic constructs corresponding to preconceptual structures in our common place experience. These preconceptual structures are the basic-level (walking, running) and image-schematic concepts (spatial space). The second factor is the power of metaphorical mapping, framing structures in the physical sphere onto constructs in the abstract realms–all within the framework of the existing structural correspondences between the abstract and the physical horizons. This constraint belongs to the system. Our image schematic and metaphorical structures prohibit some movements (inferences), making them simply impossible. Here in lies our capacity for abstraction. Finally, the third factor is the power to employ image schemata as structuring schemes in the creation of general categories and complex concepts. Thus, we can form structures of complex events and taxonomies that have subordinate (e.g., types of walking and running) and superordinate (e.g., movement) categories.

Keywords: schematic conceptualizations, meaning, understanding, and rationality

Introduction

Human Categorization

Our view on human categorization would be influenced by findings in the field of cognitive science. Cognitive science is a recent discipline that encompasses studies in the disciplines of philosophy, anthropology, psychology, computer science, linguistics. Cognitive science studies the human mind with empirical methods and investigates our conceptual systems as a scientific discipline (Lakoff & Johnson, 1999, 10).

A new discipline, cognitive science brings together the diverse interests of people investigating the human cognitive behavior from differing perspectives. It attempts to understand our cognitive functions, concrete or abstract, real or imagined, mechanical (machine) or human. It aims at understanding the principles that guide intelligent, cognitive behavior. It hopes this will enable us better understand the human mind, better appreciate and comprehend the processes of teaching and learning, and have a better grasp of our mental abilities. It is also hoped that the cognitive sciences will enable the advancement of intelligent devices for augmenting human competences (Norman, 1981, 1).

[1]Following researches in this field, people now talk of neural and prototypical categorizations. We might do well to consider these two types of categorization.

Neural categorization. All living beings have been known to categorize. Animals are said to categorize following their sensory mechanisms, motor skills, and object manipulation capacities. They classify their own kinds, their mating partners, their food. Humans also categorize, placing things in classes, to make sense of their world. Categorization is said to be an evolutionary process of a sort. We are said to have evolved to acquire an efficient capacity for categorization at the basic level. Natural categories are more easily identified with their part-whole structure. Our evolutionary process has come to recognize this fact. Thus, our capacity for maximal categorization at the basic level is associated with our evolutionary history.

In our basic-level categorizations, we do not simply organize our categories in a hierarchical order, from those that are most general to those that are most specific. Instead, we organize them in such a way that the cognitively basic are put in the middle of a hierarchical order that goes from the general to the specific. Our generalization process goes upward, climbing from the basic level; while specialization goes downward (Lakoff, 1987, 13).

Evolution as applied to categorization is not taken here in the distorted sense of social darwinianism, in which rationality is defined and live-out in terms of an animalistic maximization of self-interest (Haeffner, 1988, 79-80). People, say this is but a folk theory indicative of cultural sentiments that have been woven into evolutionary theory (Lakoff & Johnson, 1999, 58). Within this context, altruism becomes irrational. Yet evolution understood as a natural change and positively progressive is but a metaphor, and not a literal truth. People say altruism remains a better alternative to the egoism that results from this misreading of darwinian evolutionism. Haeffner’s proposal remains sufficiently weighty.

The primary egoism that results from a misreading of the darwinian evolutionary theory has never been completely discarded; its secret basic thesis that I am the center of the world because I am the center of my world is never definitively refuted (However, actually in the field of immediately practical beliefs a refutation makes no sense at all). Nevertheless, this egoism can be permeated more or less by the attitude of altruistic love, which allows the other to be his own autonomous being (recognizes his world) and gives him the positive space for it (Haeffner, 1989, 94).

Categorization is only evolutionary in the sense that it is based on the perceptual functions and motor skills found in lower animals. Utilizing our animal nature, it is said to be the upshot of the human body, the human brain, and the human interactional functions. Categorization is considered, following relevant studies in the relevant fields, as the outgrowth of the human biological constitution rather than as coming from conscious reasoning. It is constrained by the human body, and said to be, in the main, automatic.

The neurons in the human brain are held to be about100 billion and the synaptic connections are said to be 100 trillion. Information often passes from one closely knit assemblage of neurons to another through a somewhat scanty set of connections. Each time this occurs, the activation pattern shared over the first ensemble of neurons is too much to be characterized in a one-to-one fashion in the scanty set of connections.

Consequently, that scanty set of connections, of necessity, builds up certain input patterns, as it maps them onto the output assemblage. Each time neural grouping comes up with the same output with dissimilar inputs, neural categorization happens (Lakoff & Johnson, 1999, 18).

Categorization is perhaps the most fundamental phenomenon in our perceptual functions and communicative activities. One could hardly perform any intentional action without engaging in some categorization of a type. When we act, it is a certain kind of action that we carry out. Perhaps we climb, paint, and jump. These are all kinds of motor skills. The same is true of communication. We communicate orally, through signs, and in writing. All are kinds of communication. The simplest of movements we make (walking and running) fall into categories too. So also is a world of concept-categories involved in our intellectual enterprise. Most essential in this human phenomenon of classification is our categorization of abstract entities. The matter is not simply that we categorize virtually everything around us.

What makes human categorization essentially weighty is that our categories of things, events, people, and abstract entities determine what we eventually, take to be real and true. The human experience, undoubtedly, is as real as the concrete objects around us. Our categories build on this experience. So our sense of what is real is given to us by the categories we have of things. This sense of distinction, acquired through our categories of things, in turn places constraints on our reasoning process (Lakoff, 1987, 207-296).

First, the truth of a statement is always in relation to a certain understanding of it. Human understanding all the time requires categorization; and this is a function of properties that interact with one another (instead of those that are inherent) and of dimensions that grow out of the human experience.

Second, the categories employed in a statement highlight the properties on which its truth depend. For instance, light involves properties that look like waves, and puts out of sight properties that look like particles.

Third, categories are delineated by prototypes as well as by family resemblances to prototypes. And taking various purposes into consideration these categories can be adjusted in context. They're not fixed; and they are not uniform either. Statements are true or not depending on if the categories employed fit, and of course purposes and contexts make them to vary (Lakoff & Johnson, 1980, 165-166).

Being an ordering or an organization, of a sorts, that slots our experiences into aspects, categorization is as aspectual as it is experiential. In categorization we highlight a couple of properties, downplay some, and hide others; and in this way we identify a certain kind of object or experience. Everyone of these perspectives brings out and emphasizes the properties we are highlighting (Lakoff & Johnson, 1980, 163).

Our categories reveal our purposes, choices, and preferences. The classical categorization, however, defines categories by fixed and commonly shared properties of their members. Conceptual categories, within this framework, are determined by the objective properties of the category members, who share equal status.

Prototype Categorization. Prototypes are neural structures enabling us to perform inferential or imaginative functions, as it were, with regard to categories. In categorizing, we break up our experiences into kinds we can easily comprehend. This is prototypical categorization; it does not look for any conditions that are necessary and sufficient (Johnson 1987, 171). Categorization is open-ended. It is defined in the context of family resemblance and prototypes, after the manner of Wittgenstein and Rosch respectively.

Following his language game theory, Ludwig Wittgenstein holds that games, as with members of a family, resemble one another in ways bereft of well-tailored common properties. Family members, as in the family of games, belong together by virtue of family resemblance, rather than by sharing a certain assemblage of properties. Family resemblance indicates how category members may be related to one another, even as all members may not have any common properties that define the category (Lakoff, 1987, 12).

We learn also from Wittgenstein's language game theory that, relative to our purposes, categories could be widened or narrowed. As in the category of games, this tendency of categories to be narrowed or widened according to our purposes rules out any natural boundaries in the category framework. The spin-off of this phenomenon is that there could be degrees of belonging to a category, and certain members could be more or less central than others. This gives rise to the membership gradients and the centrality gradients' theories. Membership gradients shows that rather than having clear boundaries**,** some categories have only degrees of membership. Centrality gradients indicates how category members (or subcategories) distinctly inside the category boundaries could nevertheless be more or less central **(**Lakoff, 1987, 12).

This lack of boundaries in the category framework with its diverse consequences, as in membership gradients and centrality gradients – reveals that some members of a category, as is also the case with games, could be regarded as better instances of their group than others. All these are said to have consequences for classical categorization.

In line with Wittgenstein, Eleanor Rosch posits a theory of categorization based on family resemblance as well as on prototypes. Her theory follows from studies carried out by both herself and other researchers. These studies reveal that categories have their best instances, and that specific human capacities influence the human classification structure. She compares these findings with the classical definition of categories, and finds the later inconsistent with the facts on the ground.

In the first place, no category members would better instantiate a certain category than any other members, were categories defined only by properties all class members share.

In the second, categories would be independent of the peculiarities of those doing the categorizing, were categories to be defined only by properties inherent in class members. The reason is that categories include elements such as human neurophysiological factors, bodily motion, and perceptual specificities, for mental imagery formation, for learning and remembering, for organizing what is learned, and for efficient communication **(**Lakoff, 1987, 7).

This view of categorization sees this phenomenon as an outgrowth of the human experience and the human imaginative mechanism. It cites empirical data on categorization which reveal the centrality of the human experience and imaginative operations in human categorization.

The human experience, as already stated, has been known to embrace the entire man, individual, group, and inherited genetic constitution. It includes the nature of man's interaction in his social and physical environment and all man's actual and potential experiences. It comprises all the dimensions of man, perceptual operations, motoric, emotion, history, society, and language. It encompasses all that is human, the body, the mind, the intellect, and all that is involved in the complexities of the interactions that come into the way we understand the world (Johnson, 1987, xvi). Our basic-level category structure hinges on our motor movement and gestalt perception, bearing the imprint of the natural constitution of our being.

Basic categories are basic in four respects. First, this manifests in perception, through our perceiving overall shape; our having unified mental imagery; and speedy identification of our objects. Second, the way we function with our motoric behavior generally reveals how basic the basic categories are. Third, our communication reveals the words our children first learn and the words that are the first to find their way in the lexicon are the most precise, most frequently utilized and most contextually neutral words. Fourth, the way we organize our knowledge reveals that we store nearly all attributes of the members of a category at the basic level (Lakoff, 1987, 47).

The categories of color, which rest on the human neurophysiology, hinge also on the human body. Our imaginative processes (power to stockpile knowledge at a certain level of categorization, power to form mental images, and to communicate) characterize the basic level structure. These operations (imaginative) are also manifest in the prototype structure (the capacity to form and utilize idealized models, the power to expand categories from central to non-central members, employing the imaginative workings of metonymy, image relations, and metaphor.)

Incidentally, these processes and capacities do not mirror nature. If anything, they lend credence to studies in the field of cognitive science. Data on the way humans categorize disclose that we actually organize our conceptual systems not in terms of categories that are defined by fixed and commonly shared properties of their members but in terms of prototypes (Rosch, 1997, & Lakoff & Johnson, 1980, 71) and family resemblance (Wittgenstein, 1953, 1: 66-71) For instance, small singing birds, such as sparrows, are regarded as prototypical birds**;** whereas chickens are non-prototypical. People only classify chickens as belonging to the bird-category because they bear enough family resemblance to the prototype (sparrows).

Moreover, the classical account is said to be at odds with contemporary biology. Recent studies on biological species disclose conflict among experts on the placement of certain species. The rift between the phonetic and the cladistic criteria over the natural kinds of zebra and fish is a case in point **(**Lakoff, 1987, 185). The phonetics, following from their overall similarity criteria, said there are these natural kinds. The cladists, on the other hand, judging from their barometer of shared derived characters, deny the existence of any such kinds. Such is the case that in our days, people now talk of emancipating biology from a way of doing philosophy that is inappropriate (Mayr, 1984, 533). This follows from the fact that, from the perspective of evolutionary biology, when we characterize biological species, we do not partition the world of biology into distinctly demarcated natural kinds, the way "objectivist metaphysics" would have us do (Lakoff, 1987, 192).

So it is that the philosophical conception of natural kinds is but a folk conception, not part of a scientific conceptual system that enjoys general consent (Lakoff, 1987, 187). The properties of our categories have been discovered to be interactional rather than inherent. They are said to be simply about the way we interact with objects in our environment, given our bodies, that is to say, our manner of perceiving, imagining, organizing data, and relating towards objects in our milieu with our bodies (Lakoff, 1987, 198). This reinforces the claims that our art of categorizing is, at any rate, a by-product of the human experience (perceptual capacities, culture, motor skills) and the human imagination. Categories are, thus, mind-dependent and culture-specific. This is not to deny the extra-mental existence of physical objects. Mountains have a mind-independent existence. But economics cannot exist independently of the human mind. Categories exist relative to our models of cognition.

Our brief consideration of human categorization traces our categories to neuro-physiological origins. Our category organization is a combination of a number of factors, namely**:** our interaction with the world around us, the capacities associated with our bodies, the ability to categorize efficiently at the basic level (linked-up with our evolutionary process), and our neural nature.

We define categories by prototypes to serve human understanding purposes. So, rather than being fixed, we narrow, expand, or adjust categories to suit our purposes and contexts. The truth of a statement depends on how we understand a certain category for our purposes in a particular context. This is the case given that the truth of a statement hinges on if the categories we employ fit in the statement (Lakoff, 1987, 164)

Reason as Embodied

The phenomenon of the embodiment of human reason has been argued on various fronts. One could already thematizea four-fold embodiment motif. Within this frame of reference, there are neural embodiment, phenomenological embodiment, functional embodiment, and conceptual embodiment.

Neural embodiment is said to characterize the neural inner workings that generate concepts. An instance of neural embodiment could be the neural circuitry which is linked to the color cones. It is this neural circuitry, for instance, that gives rise to and characterizes the structure of our categories of colour. Thanks to these neural mechanisms, we now know why our categories of colour have their numerous phenomenological properties (Lakoff & Johnson, 1980, 164).

Phenomenological embodiment characterizes the manner we schematize our bodies and the things that come into our day-to-day interaction with the world around us. Our comprehension of image schemata through the body, according to which we form spatial-relations concepts, is a form of our phenomenological embodiment. Our framing of abstract containers onto fields in space through which we have our category structure, our understanding of motion in relation to a starting-point-path-endpoint frame, also belongs to our phenomenological embodiment (Lakoff & Johnson, 1980, 36).

Functional embodiment refers to the situation, where concepts are used automatically, unconsciously, and effortlessly as belonging to our normal functioning, rather than being simply intellectually comprehended (Lakoff, 1987, 12).

Conceptual embodiment is the idea that our social and physical functioning in our environment and our biological capacities generate the properties of some of our categories. It is in contradistinction to the idea that concepts exist independently of the bodily nature and experience of the beings that think (Lakoff, 1987, 12).

Human reason is embodied in that the structures on which reason is grounded issue from our corporal experience, and make meaning to us within this context. Grounds for an embodied reason abound. These grounds could be approached through the following themes**:** embodied concepts, the body in conceptualization, concepts at the basic level, embodied visions of knowledge and truth, embodied mind, and embodied reason. Let us now take a closer look at these themes.

Embodied concepts. The human conceptual system is not only built on our perceptual and motor mechanisms, it also employs our neural workings, and is molded by these mechanisms (perceptual and motor). Concepts themselves, as already indicated, are simply neural structures enabling us to mentally identify the distinctive and typical features of our categories and to reason about them. Hence, concepts are embodied. Embodied concepts are neural structures that are part of, or utilize, the human brain's sensorimotor system (Lakoff & Johnson, 1999, 20). Hence, our conceptual inferences are, for the most part, sensorimotor inferences (Lakoff & Johnson, 1999, 20).

Researches on neural modeling reveal that the brain comprises of a myriad of complex and immensely structured networks of neurons, which perform their neural computations to generate concepts. They disclose the possibility of the very neural mechanisms used in perception being also employed in concept formation and reasoning. Narayanan has done an extensive research in this area, which is relevant to our present inquiry. We shall therefore outline his main points in the following paragraphs (Lakoff & Johnson, 1999, 43).

Narayanan proves that the neural structure of our motor control must have had already the necessary capacities for characterizing our events-structure and their logic. He wonders if the brain could actually duplicate the system of structures for reasoning about actions if those structures were already in place. He wonders also if the brain could give a new neural form to an alternative system, in case it decided for a duplication.

Furthermore, Narayanan argues that biology reveals that our reason has not only developed out of our sensory motor mechanisms, but also continues to utilize the structures arising from these. It is for this reason that we have the kinds of concepts possessing their kinds of properties. The topological and orientational characters of our concepts could also be traced to the above reasons (the fact that our reason has arisen from our sensory motor mechanisms and uses systems deriving from them). Our model of structuring and reasoning about events in terms of the sensory motor structure derives also from this fact.

The indications are, then, researchers say, that neural structures which perform neural operations could simultaneously perform the activities of sensory motor skills (perception) and that of categorization, concept formation, and reasoning (Lakoff & Johnson, 1999, 38).

The body in conceptualization. Our body remains an enabling factor for our concept formation. Ourselves, our world, and others are better comprehended when framed and coded in body-related concepts. Even our conceptual system, relative to which we reason, draws upon our body. The body molds our conceptual system in a fascinating number of ways. Basic level concepts, as already indicated, rely on gestalt perception, motorics, and imaging. Spatial-relation concepts, such as up and down, are characterized in relation to our bodily orientations.

Our color concepts are not simply fashioned by perception, considered as a mental faculty, but also by the body parts, which are physical, e.g., the neural circuitry colour cones.

In ways mentioned above and in more ways, we find the human body taking a crucial role in shaping and determining the very nature of conceptualization. Our conceptual system itself is grounded in our interaction with one another and with our cultural and physical milieu. It is for this reason, that the concepts that emerge from it are defined in relation to the interactional properties associated with our perceptions, purposes, motor operations, and functions.

Our type of conceptual system is the consequence of the type of beings we as humans are, as well as the result of our mode of interacting with our physical and cultural milieu (Lakoff & Johnson, 1999, 119).

Concepts at the basic level. At the basic level, for maximal operation in our day-to-day activities, concepts employ imaging, perceptual and motor faculties. At this level, we are at the highest degree, in contact with our milieu. This is a function of, as well as a pointer to, our embodiment.

Embodied visions of knowledge and truth. Findings in cognitive science tells us that our reason is linked to our body and the nature of our brain. Our body, brain, environmental interaction, and interaction with one another constitute the fundaments of our visions and conceptions of reality. It is a peculiarly evolutionary perspective in which our sensibility for, and the sense of distinction between, the real and the unreal is given to us by the operations of our sensory motor mechanism.

The aforementioned discoveries of cognitive science are deeply disconcerting on two counts. In the first place, they show us how human rationality is a type of animal reasoning, a reasoning that resists decoupling from the nature of the human body and the peculiarities of the human brain. In the second place, the findings indicate that the majorly unconscious grounds for our conventional metaphysics, namely, what we consider to be real, are the human body, the human brain, man's interaction with his surroundings. Our idea of the real not only has its beginnings in, but also has an overbearing reliance on, the human body. This include our motor apparatus that allows our perception, movement, and object manipulation, and the complex brain structures shaped by our experiential and evolutionary antecedents (Lakoff & Johnson, 1999, 17).

Embodied mind. A mind-independent body is an illusion. The same is also true of the converse. The fact that our concepts and reason are generated from and employ our sensory motor apparatus is a proof in this regard. The manner our concepts are generated from our embodied structures, researchers say, is a strong indication that the locus of our rational inferences (reason) and the locus of our corporeal activities (motor and perceptual operations) converge.

So it is that researchers on the brain are asking whether our rational inference and perceptual motor inference-forms utilize the same brain structures. This follows from discoveries in neuroscience. The brains are said to have been known to put to optimal use what mechanisms there are, and to acquire only necessary additional faculties. The evolutionary process is known to have had the tendency to consolidate on what already there is. The mind, it is said, is embodied through our sensory motor apparatus. This explains why our concepts fit well the way they do with the manner of our operating in the world. The fit is understandable. Their evolution from our sensori motor system accounts for it. The sensorimotor apparatus themselves have evolved to enable us function efficiently in our physical surroundings (Lakoff & Johnson, 1999, 43-44).

Embodied reason. Inquiries show that the principal kinds of rational inference could be, in truth, manifestations of peculiar forms of sensory motor inference. Narayanan has studied motor schemata, our linguistic dispositions, and metaphor. His studies, seem to confirm this contention. The very neural structures engaged in performing motor control also reflect in our conceptual structure and linguistic mechanism; and the very neural apparatus that runs corporeal motor behaviours is also implicated in our logical inferences about how actions are structured, as a rule. With metaphorical projections of physical activities our motor schematic models show capacity to perform relevant abstract inferences (Lakoff & Johnson, 1999, 42).

What this indicates, then, is that reason is embodied in that our conceptual structure is based on our embodied structures**;** and these embodied structures are, in the main, metaphorical. Two forms of (embodied) structures in our preconceptual experience, have been identified, namely, (i) basic level structure, which consists of our gestalt perception, motor activities, and imaging**;** and (ii) kinesthetic image-schematic structures, which includes the simple recurrent structures in our daily corporeal experiences (our orientations and relations). Abstract conceptual structure emerges from the basic level structure and the kinesthetic image-schematic structure in two ways, namely**:** (i) metaphorical projections from the physical domain to abstract realm. (II) projection from the categories of the basic level to super-ordinate (e.g., movement) and subordinate (e.g., walking, running) categories (Lakoff, 1987, 267-268).

Having come this far, we would now like to show how reason is metaphorical.

Reason as metaphorical

In the discussion of a metaphorical thought, two factors come into play, namely, the existence of primary metaphors and their manner of acquisition. Let us now look closely into each of these.

Primary metaphor. Our subjective experiences and judgments correlate with our sensory motor experiences in our daily operations, with an overwhelming regularity, occasioning a neural link-up. Primary metaphor occasions our sensory motor inferences to structure our conceptualization of these subjective experiences and judgments, by activating those neural link-ups. Primary metaphor has a two-fold definition. From a neural outlook, primary metaphor is a neural connecting link, which one learns by co-activation, constituting an inferential structure. From a conceptual standpoint, it is a cross-sphere framing, from a sensory motor domain onto a subjective-experience realm, a framing that preserves the underpinning inference (Lakoff & Johnson, 1999, 57-58).

Acquisition. Some proponents of imaginative thought posit a four-part theory of acquisition of primary metaphor, namely, (i) Johnson's conflation theory, (ii) Grady's primary metaphor theory, (iii) Narayanan's neural metaphor theory, and (iv) Fauconnier's and Turner's conceptual blending theory. We now consider the four parts of the theory.

(i) Johnson's conflation theory. Johnson postulates a two-stage conceptual metaphor acquisition process. The first stage is one of conflation, during which links between coactive spheres are set up. The spheres, so fused to each other, are experienced as belonging together. The second is a differentiation period. At this period, formerly coactive domains are distinguished into metaphorical source-spheres and target-realms. Johnson’s theory is that children, in the early learning period, see subjective experiences and judgments happen together with so much a regularity that they come to know these as belonging together (conflation). They, however, come to make a distinction between the two realms much later in their learning process.

(ii) Grady’s primary metaphor theory. Here, complex metaphors are understood in relation to molecules, consisting of ‘atomic’ metaphorical pieces referred to as primary metaphors. Every primary metaphor has a small-scale structure. In our everyday ‘conceptual blending,’ during which cross-domain links are set-up, primary metaphors issue forth spontaneously, instinctively, and naturally. This fusion of metaphorical pieces into larger units (conceptual blending) gives rise to complex metaphors. World-wide conventional conceptual metaphors spring up when early global experiences give rise to global conceptual blending.

(iii) Narayanan’s neural metaphor theory. With Narayanan, the link-ups established during the time of conceptual fusion become neutrally realized as they are simultaneously activated, ending up in permanent neural links across web-works which characterize conceptual realms. These links become the anatomical ground for the activation of source-to-target domains which make up metaphorical entailments.

In this theory, we have an entailment at the neural sphere if a given succession of neural activations, **x**, gives rise to a another neural activation, **q**, connecting a cluster of neurons, **p**, in a criss-cross characterizing another domain of conceptualization , then has the capacity to activate **p**. This would mean a metaphorical entailment. P is literally entailed in the activation of **x**; so it is a

"Literal entailment" **P** is a metaphorical link to **q**, given that it is further domain of conceptualization**;** thus, **p's** activation has only been metaphorically entailed (Lakoff & Johnson, 1999, 47).

According to this theory, repeatedly experienced correlational situations lead the brain into setting up neural connections that characterize those situations as belonging together. Such neural links later do conceptual mappings between the two domains previously experienced as correlational. This kind of conceptual metaphor is said to be embodied in three ways. In the first place, the correlation grows out of our embodied operations in our everyday world where, for instance, the concept 'more'is observed to correlate with the concept 'up.' In the second place, the conceptual metaphor’s source-domain emanates from the sensorimotor system of our body. Third, the correlation is realized in the body through neural links.

(iv) Fauconnier’s and Turner’s conceptual blending theory. In Fauconnier’s and Turner’s conceptual blending theory, specific conceptual realms can be made to function simultaneously. Under given provisions, links across spheres can be set up, giving rise to novel inferences. Such conceptual links are said to be either merely conventional or entirely original. Conventional conceptual blends are said to be the networks through which a few primary metaphors could be assembled to constitute larger metaphorical complex. As Grady observes, conventional conceptual confluence brings about the formation of complex conceptual metaphors from a couple of primary conceptual metaphors. It is an assemblage, so to say, of conceptual metaphorical fragments into larger wholes.

From the neural modeling viewpoint, primary conceptual metaphor emerges through neutrally realized correlations between sensory motor activities and subjective experiences and judgments. When the various neural link-ups of these two domains are made to go into operation, you have a conceptual blending of the two. Again, neural links are set up in childhood during the stage of conflation, when, in our daily experiences, the conceptual scaffolding which define the realms are made to go into operation simultaneously. The sensory motor networks carry our complex inferential functions. Through the neural link-ups, what comes out of these inferences is framed from the sensory motor basketry onto the subjective judgment scaffolding. Neural modeling investigates these aspects of configurations of neurons that carry out the neural computation (conceptual scaffolding) we experience as particular aspects of rational thought.

Conceptual primary metaphors belong to the cognitive unconscious. We obtain them unconsciously through our natural learning process. We unavoidably acquire our repertoire of primary metaphors in our everydayness as we move and perceive. Frequently co-activating domains of subjective experience or judgment with sensory motor domains, establishes permanent neural links through synaptic weight changes. Such myriads of unconsciously formed connections, give subjective domains structures of inference-mechanism and qualitative experience that we activate in the sensorimotor apparatus. It is this process of neural selection that builds our system of metaphorical conceptualization. (Lakoff & Johnson, 1999, 57)

People say one would hardly reason if there were no conceptual metaphors. This is not to deny the existence of literal concepts. Rather, the merit of this proposition is that complex metaphorical reasoning, has an enormous power for drawing inferences, devoid of which abstract thought would be terribly impoverished. Our subjective experiences and judgments, they say, are better expressed within the context of the mechanisms of sophisticated metaphorical reasoning.

To recapitulate, our inquiry into conceptual primary metaphors indicates the existence of a myriad of them. Thanks to those conceptual primary metaphors, when the networks of our subjective experiences and their corresponding neutrally linked sensory motor networks are simultaneously put into operation, a wealth of inferential structure emerges. Terms derived from our sensory motor experience are employed too in the expression of our metaphorical conceptualization of our subjective experiences.

Again, with Narayan and others, we have a neural theory of metaphor that accounts for how we acquire primary conceptual metaphors, explains why we are in possession of the ones there are, and offers a neural machinery for our metaphorical inferences. Our primary conceptual metaphorical system is but sequential to the kind of brains and bodies we have and the type of world in which we operate. In a world, such as ours, with an inclination toward associating familiarity with nearness, and friendship with comfortable heat, our primary conceptual metaphorical system, could only be but a natural phenomenon (Lakoff & Johnson, 1999, 59). One could, then, talk of a metaphorical reasoning.

Metaphorical reasoning. With conceptual metaphors, sensory motor inferences can be employed for the enterprise of abstract conceptualization and reason. It is through these inner workings that abstract reason is embodied and metaphorical. That reason is metaphorical, is manifested in virtually all areas of human thought and knowledge. For instance, such social Darwinian ideas that regard natural change as evolution, or natural change as the survival of the best nurtured, or natural change as the best of results are all metaphorical conceptions. Non could be taken as a literal truth. The same applies to many statements of the mathematical and empirical sciences.

What is more, attempts at definitions, in whatever field of human endeavor, begin with metaphors. Taken literally, for instance, the Euclidean straight line could not be simply having **"**length without breadth**,"** except when understood metaphorically. Aristotelianism must have known the genius of conceptual metaphor in complex and abstract thought when it defined God as an unmoved mover, a prime mover. Even the sacred field of theology, is not spared of metaphorical projections. As already observed, God couldn't be Lord of Lords and King of Kings, except within the context of a metaphorical conceptualization.

Reason as Imaginative

The human reason is said to be imaginative in two senses. First, human reason is imaginative in the sense that, those of our concepts that are not directly rooted in experience make use of the imaginative process of conceptual metonymy, imaging, and conceptual metaphor. As aspects of our imaginative capacity, these transcend the literal representation, or mirroring, of the external world. This imaginative capacity, in its various manifestations, leads the human mind beyond our immediate visual sphere and feeling, occasioning abstract reason. Given that the conceptual metonymies, mental images, and conceptual metaphors are themselves grounded in the human experience, the imaginative capacity is itself indirectly embodied.

Second, whenever human categorization is carried out in a manner not mirroring literally the realities of the external world, human reason would be in that very instance imaginative, even if in a mild form. For, in such moments, it is the human imaginative capacity that is being employed. So it is that, human reason is imaginative, since it employs conceptual metonymies, conceptual metaphors, image-schematic structures, and mental images. These imaginative aspects of the human mind, especially conceptual metaphor and conceptual metonymy, transform the schematic structures characterized by our human experience into shades of reason said to be sufficiently weighty to define human reason.

The view that reason is imaginative could be further argued on two fronts, namely, our use of imaginative processes, and imaginative models of cognition – the conceptual metaphorical models and the conceptual metonymic models.

We now would like to consider the situations when our imaginative processes are on hand for use, as well as discuss the aforementioned imaginative models of cognition.

When the imaginative processes come into play. When do imaginative processes come into the picture? We recall that in the precious chapter, we stated the hypothesis of the existence of two preconceptual structures in our experience, namely, the basic-level structure and the image-schematic structure. We also noted that investigations into categorization at the basic level revealed the presence of basic-level preconceptual structures, which are known to be the outgrowth of our mental imaging, motor behavior, and gestalt perception. We indicated to the presence of some recurring structural patterns in our experience, following from our natural orientations and our bodily nature.

Now, there are spheres devoid of preconceptual structures of experience. Humans have been known to employ the imaginative processes of the human cognition to supplement for such spheres. Thanks to these imaginative aspects of the mind, specifically in conceptual metaphorical and conceptual metonymic functions, humans are led into comprehending realms of experience bereft of preconceptual structures of their own. This comprehension of the human experience, especially through conceptual metaphor, is held to be one of the highest-ranking of the imaginative breakthroughs of the human mind (Lakoff, 1987, 309).

The general conceptualizing capacity which attends our imaginative capacities, generates concepts that bear the imprints of the imaginative process. Though these capacities are global, they may be employed in specific manners that may characterize lines along which conceptual systems may vary across cultures. The reason is that diverse people may have contrasting highly structured experience-domains. Since we have a general competency for conceptualization and the linguistic competency for language, conceptualizing and naming structured aspects of our experience-domains becomes possible (Lakoff, 1987, 309).

Much of these imaginative processes and operations are woven into thought beyond the tier of cognitive consciousness. Cognitive science places at our doorsteps a certain enlarged view of consciousness, a viewpoint that includes the cognitive unconscious. Understanding what constitutes the cognitive unconscious broadens our understanding of the nature of consciousness. Consciousness transcends one's sheer awareness of an object, transcends the sheer experience of qualia (the qualitative awareness of pain or anger, for instance), transcends one's awareness of one's awareness, transcends one's manifold apprehension of immediate experience that the brain provides. Consciousness includes every one of the aforementioned in addition to the constitutive framework that the cognitive unconscious affords us that enables the awareness of everything we are aware of (Lakoff & Johnson, 1999, 11).

Imaginative models of cognition. Having discussed how imaginative processes come into play, we now move on to a consideration of the imaginative models of cognition. The human conceptual categories are replete with properties that are the offshoots of our imaginative processes. These imaginative processes characterize our basic-level structure. Our power to communicate, to stockpile knowledge at a certain categorization level, and to build up mental images all are said to belong to our imaginative procedures. The imaginative processes are also evidenced in our prototype structures. They embrace the faculty to establish and utilize idealized models of cognition, the ability to use one thing to stand for another in response to some purpose, the power to stretch categories from core to halfway members employing the imaginative capacities of image relations, conceptual metaphor, conceptual metonymy, and mythological associations (Lakoff, 1987, 371).

Image-schematic models. The image-schematic models of cognition streamline Kinesthetic image schemata. These structures fashion and characterize our cognitive operations. Our conception of vision, for instance, has a spatial undertone, following from our in-out schema. Thus, objects come into and go out of our visual fields. And our notion of motion takes after the from-to schema. Modeled after this schema, motion is always movement from one spot to another. The image-schematic models provide the structures with which the imaginative models perform their imaginative functions. These are but instances of schematic images which not only influence our category structure but also model our discourse configurations and rational inferences.

Conceptual metaphoric models. Conceptual metaphoric models are instances of framing from an image-schematic or propositional model in one sphere (the source-sphere) to a corresponding construct in another realm (the target-realm). The conduit metaphor for communication, for example, frames what we know about transporting objects in containers onto our conception of communication. Hence, communication becomes transporting ideas in words (Lakoff & George, 1987, 114).

Conceptual metonymic models. Conceptual metonymic models, are models that incorporate either one or all of the already discussed models. There is then an additional activity going from one feature of the model to yet another component. Hence, in a certain representation of a part-whole structure, there could be a be a part-to-whole functioning that warrants the part to represent the whole (Lakoff, 1987, 114).

There are forms of conceptual metonymic models, which yield reference-point or metonymic reasoning. These models are commonplace, cutting across cultures. We could take a cursory look at a few of them.

Ideals. Humans tend to form quality judgments and make plans for the future. These quality judgments and future plans are later used as reference-points, fashioning and shaping our reasoning. Lots of categories are conceived in relation to abstract ideals. Cultures have ideal families, mates etc.

Sub-models. Human beings are known to estimate sizes, make approximations and, do calculations. In the course of time these appraisals, assessments, approximations and calculations begin to assume the status of literal truths in that they become reference-points. For instance, the world's population is estimated to hit a six-billion target come the year 2030. It is not uncommon that after a while people could lose sight of the fact that this is only an estimate and a projection, and begin to treat the world as actually hitting that projected target.

Social stereotypes. Everybody knows about social prototypes. It is the human habit of making a priori and spontaneous judgments about people, events, and situations. The verdicts are so reflexive and so conclusive that they hardly leave room for any reflective judgment. 'The Africans are corrupt', 'The Red Indians are stupid'. Interestingly enough men spend decades on these stereotypes, investing energy, time and resources to advance them. The point being made here is that social stereotypes constitute part of our reference-point reasoning. Only a select few, perhaps the philosopher-kings, escape their grips. They define cultural expectations, and are used in reasoning, especially in jumping to conclusions and drawing hasty inferences.

Paragons. Paragons refer to moments in our thought process when comparisons that are later employed as behavioral patterns are made. We reason about categories of things in relation to category members which stand for an ideal or contradict an ideal. We frequently acquire knowledge of paragons upon which our actions are frequently predicated. Incidentally, we also usually predicate inferences on a folk psychology that being a paragon in a certain domain makes one a paragon. Such is the case that we are disappointed and shocked to see amazing actors engaged in objectionable behaviours in the society**.** (Lakoff, 1987, 88)

Salient examples. In salient examples, we make probability judgments. Here, familiar cases are used to understand and reason about categories, letting salient examples represent whole categories. Here is a salient example. Consequent upon an extensively hyped violencerate in Nigeria, many Americans refuse to holiday in Nigeria, choosing rather to holiday in US cities like New York and Chicago, despite the fact that they have overall worse safety records than major cities in Nigeria, such as Abuja and Portharcourt. Americans use the salient example of the stories about violence in Lagos to stand metonymically for the entire category of Nigerian cities with regard to safety judgments (Lakoff, 1987, 86).

Typical examples. Typical examples represent the practice where, informed by typical instances, we draw inferences from paradigmatic examples to non-typical examples. For instance, kartoffel is a typical food. Bier is a typical drink. Our society hardly discusses typical examples, and the typical examples hardly change appreciably in our lifetime. Rather than using them to delineate cultural expectations, we use them in reasoning (Lakoff, 1987, 86).

Much of our classification of the world around us is carried out in relation to typical examples. And people say we draw important inferences on this basis so regularly and so automatically that we are hardly aware of this practice. Reasoning grounded in this human tendency is said to be an essential aspect of our reasoning process (Lakoff, 1987, 86).[2]We make the inference that typical men have lots of muscles. Thus we consider a man atypical if he does not have lots of muscles (Lakoff, 1987, 86).

In these and in a couple of other ways, conceptual metonymy presents itself as an integral part of the way humans think, talk, and act. As already indicated, in contrast to conceptual metaphor, whose function is principally one of understanding, conceptual metonymy has essentially a **"**referential function**,"** letting one thing to stand for another. The following sentences could reflect this referential function of conceptual metonymy**:** 'Washington is having a diplomatic face-off with Lagos'. 'Berlin has severed links with Paris'. 'We have a new face on the staff of the School of Graduate Studies'.

Even as metonymy permits us concentrate more on some aspects of what we are referring to, it accomplishes the same aims metaphor fulfills, and in almost the same manner. And given that it is neither merely a poetic nor rhetorical tool, it is similar to metaphor. It is also not merely linguistic (such as when the part represents the whole). In our daily thinking, acting, and talking, metonymic concepts (such as letting parts represent wholes) are part of our everydayness. For instance, our conceptual framework uses faces to represent persons, indicating how parts stand in for wholes (Lakoff & Johnson, 1980, 37).

This manner of thinking, metonymic thinking, is very much an integral part of our thought pattern, being deeply ingrained in our culture. The habit in photography and painting that let the face stand for a person, and the tendency, even in our halls of learning, to let passport-sized photographs represent people, and the societal tendency to make assessments based on these facial representations, all these and more are but indications that metonymic reasoning functions effectively in both our societal, artistic, and intellectual cultures.

That people are perceived in relation to their faces and facial representations, and that we actually act on these perceptions (making some form of evolution in relation to them is, indeed, suggestive of the level of metonymic thinking that attains our rational thought and actions. The

[2] (WFDT 86)

characteristics of the conceptual metonymic model of cognition can be easily instantiated and illustrated.

Conclusion

Let's assume we have a **"**target**"** concept we want to understand for some reason in certain context. Let's assume also we have a conceptual framework that contains both the first concept and a second concept. The first concept is either a part of the second concept or has a close link to it in our conceptual structure. Normally, in our conceptual framework, choosing the second concept regulates the first to some appreciably distinctive degree. When one compares the second concept to the first, the second concept is either more straightforward to comprehend, simpler to recall, simpler to recognize, or has a better immediate use for the purpose and context. A model of metonymy, then, will be a model of how the first and the second concepts are correlated in a conceptual structure. The connection is determined as we function from the second concept to the first. Where we have this kind of conventional model of metonymy as part of a conceptual framework, the second concept may metonymically represent the first. Should the first concept be a category, the outcome will be a "metonymic model" of this category. Usually a prototype effect crops up in this kind of constellation (Lakoff and Johnson, 1981, 84-85).

Our inquiry into image-schematic structures and their various metaphorical extensions and elaboration, our consideration of the various dimensions of imaginative cognitive connections and processes, and fact of the many forms of metonymic thinking, all seem to lead to the hypothesis that we use our imaginative faculties and processes to contemplate and talk about what we experience.

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