The Notion of Notion

Nagib Callaos
www.iiis.org/Nagib-Callaos, @nccallaos

University Simón Bolívar and the International Institute of Informatics and systemic: IIIS (wwwi.iiis.org)

Purpose

Elsewhere[1] we tried to define "definition" and, after identifying more than 20 different definitions of "definition," we had no option but to *describe*, and try to relate, the different definitions, conceptions, believes, opinions, and uses associated to the term "definition." Consequently, it is better to refer to the term of "definition" as a notion, i.e. clusters of (partially or completely) related set of concepts, beliefs, ideas, theories, impressions, and/or uses of the term. A second step in this enquiry would be to provide the meaning of the term "notion." Since there are several, if not many, conceptions and uses of the term "notion," an adequate way to approach this second step is to identify the "notion of notion." This is objective of this short essay, or position paper.

When to approach a linguistic component as a "notion"

A term or a concept should be approached as a "notion" when A it lack consensus about what might define it, when several competing definitions are made regarding the concept, or when a diversity of senses are found in its uses. As we will show below, the meaning of "notion" includes the sense of "concept" but it is not reduced to it. A definition, or several definitions, might be included in the description of a notion, but this description is not to be limited to these concepts or definitions, ir may, and should, include the beliefs, theories, impressions, ideas, etc. associated to the corresponding term.

General meaning of "notion"

Merriam-Webster defines the term "notion" as "(1)**:** an individual's conception or impression of something known, experienced, or imagined (2)**:** an inclusive general concept (3)**:** a theory or belief held by a person or group."[2] The cognition and the corresponding description associated to (1), (2), and/or (3) is what is required when addressing a notion.

Notion is product of *cognition*, i.e. of cognizing the "*notes*" associated to uses/senses of a term and/or to its possible associated conceptions. Both terms, "notion" and "cognition," derive from the same Latin root '*nōtus*'. Cognition derives from co- (together) and '*gnoscēre*' which is an older form of *noscēre*'. In turn, '*(g)noscēre*' is past participle of '*nōtus*' which means "a becoming acquainted, a taking cognizance, an examination, an investigation, a conception, idea, notion."[3] To achieve our purpose in this short essay we need to cognize, to note, and, then, to

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[1] N. Callaos, 1995, *Metodología Sistémica de Sistemas: conceptos y Aplicaciones*, Caracs, Venezuela: Universidad Simón Bolívar, 687 pages; Chapters 2, 3, and 4; pp. 33- 100.

[2] Merriam-Webster, 1999, *Merriam-Webster's Collegiate Dictionary*; third edition, Springfield, Massachusetts, Merriam-Webster, Inc

[3] The Century Dictionary and Cyclopedia, op. cit. p. 4027

describe the 'notes' of notion, i.e. to describe the "notion of notion," what is or might be the meaning of "meta-notion." Cognition processes have different kind of products. Notions and meta-notions are among the different kinds of products generated by cognitive processes.

Roland H. Kaschek affirms that "Notions are considered as cognitive entities that function as representations of group of words that, with respect to a given context, are used in the same way … Notions in this sense are abstract. So called subject notions serve as a template for referring to individuals in the domain. For each domain of individuals an extent is ascribed to the subject notion, that is, a set of individuals in that domain which are as instances of the notion."[4] When Kaschek refers to "individuals" in the context of subject notions, he is implicitly referring to material or empirical individuals. A general perspective would associate the "notion of notion" to a set of empirical or non-empirical individual. The notion of "computer" would refer to the set of all individual computers; the notion of "computing" would refer to the set of all computing processes including both natural and artificial computing. A notion represented by a word or a phrase would refer to all instances in which the word or the phrase has been used.

Notions descriptions as support for inter-disciplinary activities

Among what characterize notions and meta-notions are their conceptual comprehensiveness, inclusiveness, and flexibility. These characteristics are a required support for ***inter-disciplinary communications, Research and Education***. Specific *definitions* in disciplines and sub-disciplines are required for precise and efficient intra-disciplinary communication, research, and education. But, the cost of these intra-disciplinary benefits is its inadequateness for inter-disciplinary communication which needs flexibility, comprehensiveness, and inclusiveness at the cost of loosing precision, exactness, and efficiency. Consequently, a ***tradeoff between efficiency and effectiveness*** should be thought in scientific/engineering activities. The more disciplinary precision and efficiency at the disciplinary level, the less effectiveness at the inter-disciplinary lever because of the necessary lose of comprehensiveness, inclusiveness, and flexibility.

Notions and concepts

Let us now address the notion of "notion." Similarly to what we said above, the term "notion" means a "general concept; a mental representation of a state of things;… a thought; a cognition;…In the Lockian philosophy, a complex idea;…In the Hegelian Philosophy, that comprehensive conception in which conflicting elements are recognized as mere factors of the whole truth…an opinion; a sentiment; a view; especially, a somewhat vague belief, hastily caught up or funded on insufficient evidence and slight knowledge on the subject…The mind; the power of knowledge; the understanding."[5]

Sir W. Hamilton, in his *Lectures on Logic* affirmed that "Concept or *notion* are terms employed as convertible; but, while denote the same thing, they denote it in a different point of view. Conception, the act of which concept is the result, expresses the act of comprehending or grasping up into unity the various qualities by which an object is characterized; *notion*, again,

[4] R. H. Kaschek, 2007, "Modeling confidence for Assistant Systems," *Intelligent Assistant Systems: Concepts, Techniques, and Technologies*; Hershey: Idea Group Publishing, p. 70.
[5] Whitney, D. W. (Ed.), 1969, *The Century Dictionary and Cyclopedia*, Century Co; p. 4027

signifies the act of apprehending, signalizing—that is the remarking or taking note of the various notes, marks, or characters of an object which its qualities afford; or the result of that act…The term *notion* like conception, expresses both an act and its product."[6]

Since *notion* includes "the remarking or taking note of the various notes, marks, or characters of an object which its qualities afford; or the result of that act," let us make a brief collection of the notes, uses, denotations, and connotations that the word "notion" have historically had. A historical review of a word or a concept is strongly suggested even in the context of making a scientific definition. Ackoff, for example, stressed the fact by which "*historical analysis of the use of a concept can often reveal a trend in the evolution of the concept or a consistent theme of meaning which persist through numerous variations.*[7]" This is why he exhorts to initiate a scientific defining process by formulating a *tentative definition* based on the evolving core identified by a historical analysis. It is our experience that Ackoff's suggestion is a valuable and a practical one, and that taking it to an extreme, by going to the etymological meaning of the word being defined, is also helpful because it would suggest a pre-tentative definition. The *suggestive* effect of historical linguistic analysis has been stressed by several authors. Collin Cherry, for example, affirms that "Real understanding of any scientific subject must include some knowledge of its historical growth; we cannot comprehend and accept modern concepts and theories without knowing something of their origins—of how we have got where we are."[8] Being the root of different senses or meanings, the etymological definition frequently suggests a general concept from which more specific ones are generated through history. This is why we think that the etymological source may help us in abstracting a general definition from the varieties of the specific ones that appeared through history. This is one of the main reasons why we referred above to the etymological root of "notion." Another reason was to show that this root is the same of cognition and to suggest as a hypothetic initial conclusion that "notion" is "cognition" though not all cognitions are notions. If this conclusion is right the all what we can be predicated from "cognition" can also be predicated from "notion," though the inverse is not necessarily true.

If Ackoff's (and Cherry's) suggestions of a brief historical description oriented to a "conceptual definition" are important for a scientific definition, it is even more important for identifying the notion of "notion" because the meaning of this term includes "conceptual definitions." But since the description of a notion is not limited to "conceptual definition" we will depart from Ackoff in the sense of identifying and describing the *union set* of definitions, notes, uses, etc. found through the history of the term, and not just the *intersection set* ("consistent theme of meaning which persist through numerous variations") suggested by Ackoff. We are using here the conception of meaning as a set of senses, and this is why we are referring to union and intersection sets in order to communicate the way we are extending Ackoff's suggestion. Consequently, historical references will be made in order to characterize what "notion" represents, i.e. to describe the notion of "notion."

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[6] Quoted by Whitney, op. Cit.

[7] R. Ackoff, R., 1962, *Scientific Method: Optimizing Applied Research Decisions*. New York: John Wiley and Sons. p. 148

[8] C. Cherry, 1982, *On human Communication: A Review, A Survey and a Criticism*, An MIT Press Classic, Cambridge, Massachusetts: The MIT Press, p. 32. See also C. Navarte, C., 1981, *Problemas de Método y Teoría*. Santiago de Chile: Universidad de Chile; p. 158; who also makes similar affirmation regarding the importance of the history of a concept for an adequate comprehension of it.

Three main clusters of senses associated with the term "notion"

Two main senses of the term notion are found in its historical origin. Cicero started using the term "*notio*" to translate the Greek terms '*Eunoia*' (εὔνοια) and '*prolepsis*' (πρόληψις). The common meaning of both terms is thought, idea, image in the spirit of in the intellect. But while, '*Eunoia*' was used by many Greek authors as "idea" in its general sense, '*prolepsis*' was used by the Stoics and the Epicurean as ***anticipated*** "idea" or "image." This is why '*prolepsis*' has been translated as "anticipation,"[9] and why the term 'notion' includes "***designium***," i.e. "***design***" among its different senses. Design is a notion in its sense of prolepsis. But, the notion of prolepsis is not limited by its sense of "design." The word '*prolepsis*' has also been used in the sense of "pre-conception." Epictetus, according to Brad Inwood made "the important innovation, which concerns the so-called pre-conception ('*prolēpseis*') the antecedent notions which most human share…Epictetus converts these preconceptions into something approaching innate ideas."[10] David Sadley affirms that '*prolēpseis*' (in its epicurean sense of preconception) "function like a set of shared intuitions which we can hope to rediscover beneath our acquired false beliefs and to use as common ground for joint philosophical enquiry."[11] This is why "notions" in their sense of Epicurean '*prolēpseis*', i.e. as preconceptions, are one of the three criteria of truth proposed by Epicure.

Resuming we might identify three main senses (or main clusters of senses) of the term "notion": 1) *ideas*, in general, '*Eunoia*', 2) *anticipations* ('*prolēpseis*' as it was used by Epicureans and Stoics), and 3) *preconceptions or innate ideas* (as Epictetus used '*prolēpseis*').

The term "notion" continued to be used as idea in general, but while "idea" might have been referred (by some authors) to a *reality* principle, the term "notion" has always been used associated to knowledge, or as principle of *knowledge*. This means the "idea" may be used an ontological and/or epistemological domain; "notion" has been used just in an epistemological, knowledge, or cognitive domains. On the other hand, a "conception" differs from a "notion" because the first one may be the production of reality while the latter is always the reception and the recognition of the idea of a reality.[12] When a notion is a very basic one and equivalent to a principle, it is usually known as "common notion," which mean that such a notion should be admitted by any rational subject. Many authors used the term "notion" as "mental representation" of an object; which might be the representing act or its product.[13] Accordingly, the notion of "notion" is a meta-representation, i.e. a representation of representations associated with the term "notion." This meta-representation is a cognitive one first and followed by a verbally descriptive one. If we differentiate between mental and non-mental representation then we might conclude that an external verbal description of the notion of "notion" is a 4th level

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[9] J. Ferater-Mora, 1969, *Diccionario de Filosofía*, Buenos Aires: Editorial Sudamericana; Vol.II, p. 290

[10] B. Inwood, 1998, "Epictetus," in E. Craig (general Editor), *Routledge Encyclopedia of Philosophy*,), Vol. 3, p. 338

[11] D. Sedley, 1998, "Epicureanism," in E. Craig (general Editor), *Routledge Encyclopedia of Philosophy*,), Vol. 3, p. 445

[12] Ferrater-Mora, op. cit. p. 290

[13] Ibid.

representation, two levels of mental representations and two levels of verbally-external representations associated with the mental ones.

Common Notions

Chrysippus and others stoics frequently used the expression "κοιναι εννοιαι" which was translated to Latin as "*notiones communes*" or common notions. They meant by this term a set of ideas or basic notions which were recognized by the mind as adequate and fundamental for any subsequent inference or knowledge generation.[14] Euclid used the same expression to refer to the five axioms of his *Elements.* Ivor Bulmer-Thomas affirms that in book I of the *Elements* "there are also [besides the respective definitions] prefixed five postulates (αιτήατα) and five common notions (κοιναι 'έννοιαι) or axioms which are the foundation of the entire work."[15] Bulmer-Thomas observes that "Euclid's postulates and axioms or "common notions" undoubtedly show the influence of Aristotle's elaborate discussion of these topics."[16]

Platonists usually associate "common notions" to "innate ideas." Ralph Cudworth (1617 – 88), for example, combined the Platonic theory of '*anamnesis*'[17] with the Stoic "κοιναι εννοιαι" and the concept of prolepsis (anticipation) to formulate the conception that mental processes are some kind of foreknowledge or anticipation. With regards to this issue, Sarah Hutton affirms that Cudworth's "a priori account of cognition accords with his fundamentally Platonic tenet that intellect precedes the world, ideas pre-exist things."[18] Rationalists (Descartes, Leibnitz, Spinoza, etc.) have similar conceptions of "common notions". Let see some examples.

James Hill affirms that "the term "notion" played a special role in the expression of innatist doctrine. Descartes used the terms notio/notione in Latin (and notion in French) to describe mental contents underived from sense. In fact he came to distinguish systematically between sense-based images (imagines) and notions (notiones)… the term *notio* is used to describe non-sensual ideas that have a special epistemic status. Descartes links his use of the term to its etymology: *notiones* are the simplest constituents of knowledge that are *per se nota*—"known through them selves," or "self-evident."[19]

Descartes affirms that "The mind, then, knowing itself, but still in doubt about all other things, looks around in all directions in order to extend its knowledge [*cognitionem*] further. … Next, it finds certain *common notions* from which it constructs various *proofs*; and, for as long as it

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[14] Ibid. pp.290-1

[15] I. Bulmer-Thomas, 2008, "Euclid," *Complete Dictionary of Scientific Biography*; *Encyclopedia.com.* Accessed on May 25, 2013 at http://www.encyclopedia.com/topic/Euclid.aspx

[16] Ibid.

[17] Anamnesis (from Greek: αναμνησις *reminiscence, recollection*), in a Platonic perspective, refers to learning processes by means of which knowledge is achieved via recollecting ideas that existed before the learner was born. In this sense anamnesis means basically learning (*mathesis*) via anamnesis (recollection). It is a version of a theory of "innate ideas."

[18] S. Hutton, "Cudworth, Ralph," in Edward Craig (Ed.) Routledge Encyclopedia of Philosophy, London and New York: Routledge, Vol. 2, pp.739-744; p. 742

[19] J. Hill, 2010 , "The Synthesis of Empiricism and Innatism in Berkeley's Doctrine of Notions" in S. H. Danie, M. A. Hight, S. Parigi, L. Jaffro, and T. Stoneham (Eds); 2010, Berkeley Studies No. 21; pp. 3-15; p. 4-5

attends to them, it is completely convinced of their *truth*."[20] Consequently, Descartes associates "common notions" to principles, proofs, and truth, i.e. undoubted axioms, from which we can constructs proofs and find truths. It is evident then that Descartes conception of "common notions" is very similar to Euclid's, if not the same but also applied to philosophy and not just to Geometry. Lex Newman affirms that "Descartes' own designs for metaphysical Knowledge are inspired by Euclid's system...Descartes maintains that [the arguments in the *Meditations*] *can* be reconstructed as such, and he expressly does so at the end of the Second Replies — providing a "geometrical" exposition of his central constructive steps, under the following headings: *definitions*, *postulates*, *axioms or common notions*, and *propositions*."[21] From this kind of associations and methodological similarities emerged what is known as the "Geometrical Method" in many sciences and in Mathematics, Logic, and Philosophy

With regards to Leibniz, he wrote "The soul originally contains the principles of several notions an doctrines, which are merely reused on certain occasions by external objects, as I hold along with Plato […] The stoics called these principles prolepses, that is, fundamental assumptions or what we take for granted beforehand. Mathematicians call them *common notions* (*koinai énnoiai*). Modern philosophers give them other excellent names … living fires, flashes of light [*traits lumineux*], hidden within us but appearing at the instance of the senses."[22] Consequently, it is evident in Leibniz the association of "common notions" to principles, origins, fundamentals, *koinai énnoiai*, axioms (in mathematics, geometry, etc.). They are at the origins of our conceptualization and thinking processes, representing the fundaments on which the rational edifice is constructed.

For Spinoza, "common notions" are one of the three kinds of knowledge. The other two kinds are: sense-experience knowledge[23] and intuitions. Sense-experience knowledge is, according to Spinoza, the sole cause of falsity and a way of providing representations that is "mutilated, confused and without order for the intellect"[24] Common notions are, according to Spinoza, are conceptions of things "which are common to all, and which are equally in the part as in the whole"[25] Richard Manning affirms that "given Spinoza's views about sensation is it hard to see how such common notions could arise from sensation, and to the extent we can make sense of this, the common notions seem limited to ideas of extremely general features of physical objects, far too general to be a source of any of the kinds of particular observational knowledge required

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[20] Rene Descartes, *Principles of Philosophy*, 1.13. Cited by L. Newman, 2010, "Descartes' Epistemology", *The Stanford Encyclopedia of Philosophy* (Fall 2010 Edition), in Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2010/entries/descartes-epistemology/>. Accessed on June 20, 2013 at http://plato.stanford.edu/entries/descartes-epistemology/

[21] L. Newman, op. cit. who also cites Descartes. Italics are Desrates'.

[22] Cited by P. Riley, 2008, "*Leibniz on Natural Law in the nouveaux Essais*" in Marcelo Dascal (Ed.), 2008, *Leibniz: What Kind of Rationalist?,* Springer-Verlag New York, LLC; pp. 279-292; p. 286. Iralics are Leibniz's; underlining ours.

[23] This kind of knowledge involve two different ways of cognition: "I) knowledge from singular things; II) knowledge from signs" R. Manning, 2012, "Spinoza's Physical Theory", *The Stanford Encyclopedia of Philosophy* (Spring 2012 Edition), Edward N. Zalta (ed.), accessed on June 19, 2013 at http://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=spinoza-physics, or http://plato.stanford.edu/archives/spr2012/entries/spinoza-physics/.

[24] B. Spinoza, *Ethics*, (IIp40scolium2); cited by R. Manning, op. cit.

[25] Ibid. IIp38

for experimental practice."[26] Manning, returning the Spinoza's text, ask "what…is even possibly shared by each thing and equally in the part of each as in the whole?" Then he answers, "The only obvious candidates are properties that follow from the nature of extension: i.e., taking up space, and being subject to motion and to the laws of geometry." Consequently, it seems that Spinoza is using the phrase "common notions" is a sense very similar to that used by Euclid, i.e. in the original sense of "κοιναι εννοιαι".

Consequently, it is evident that rationalists conceived "common notions" in the way Euclid conceived them, though with different nuances. In this context, the expression "κοιναι εννοιαι" (common ideas) was also translated as "*innate principles*" or "*primary notions,*" which means that "*common notions*" were used as synonyms of "*innate principles*" or "*primary notions.*"

Empiricists, on the other hand, had different kind of conceptions. John Locke for example, when refusing the existence of innate principles, wrote "It is an established opinion amongst some men, that there are in the understanding certain innate principles; some primary notions, koinai ennoiai [κοιναι εννοιαι], characters, as it were stamped upon the mind of man; which the soul receives in its very first being, and brings into the world with it. It would be sufficient to convince unprejudiced readers of the falseness of this supposition, if I should only show (as I hope I shall in the following parts of this Discourse) how men, barely by the use of their natural faculties, may attain to all the knowledge they have, without the help of any innate impressions; and may arrive at certainty, without any such original notions or principles."[27]

Locke used the word 'notion' as synonym if 'idea'. He explicitly said so. In book I entitled "Innate Notions" (of his most known book: *An Essay Concerning Human Understanding*) wrote "I have used it [the word 'idea'] to express whatever is meant by 'phantasm', notion', species, or whatever it is that the mind can be employed about in thinking."[28] Consequently, Locke uses the word 'notion' as 'idea' and it refers to any mental or cognitive content. Taking into account the empiric intellectual stand maintained by Locke (all mental contents are originated and derived from empirical experience or sense data), notions are also originated in sense-data. This is why he strongly opposes the rationalists doctrine of 'innate notions,' 'innate ideas,' 'primary notions,' and, hence, the existence of 'common notions' if these are understood as 'innate notions'.

George Berkeley, usually also included among the empiricists, have a more moderate intellectual perspective. Some authors (e.g. James Hill[29]), even affirm that Berkley has synthesized Empiricism and Innatism regarding the conception of 'notion'. With this regards, Hill affirm "Berkeley's doctrine of notions is an account of concept-formation that offers a middle-way between empiricism and innatism." Hill bases his argumentation mostly on the following text of Berkeley (Siris 308[30])":

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[26] R. Manning, op. cit.

[27] John Locke, 1690, An Essay Concerning Human Understanding (First published in1690) and re-published in 1999 by the Pennsylvania State University Electronic Classics Series, Jim Manis, Faculty Editor, Hazleton, PA; p. 27; accessed on June 19, 2013 at http://www2.hn.psu.edu/faculty/jmanis/locke/humanund.pdf

[28] Ibid.

[29] J. Hill, op. cit. p. 3

[30] Referenced by J. Hill, as follows: "Works 5: 143. Here and elsewhere the reference is to The Works of George Berkeley, Bishop of Cloyne, ed. A. A. Luce and T. E. Jessop, 9 volumes (London: Thomas Nelson, 1948-57)."

> "[Aristotle] held that the mind of man was a tabula rasa, and that there were no innate ideas. Plato, on the contrary, held original ideas in the mind; that is, notions which never were or can be in the sense, such as being, beauty, goodness, likeness, parity. Some, perhaps, may think the truth to be this: that there are properly no ideas, or passive objects, in the mind but what were derived from sense: but that there are also besides these her own acts or operations; such are notions."[31]

Consequently, according Hill's interpretation, which we share, "When Berkeley writes, 'Some, perhaps, may think the truth to be this,' I understand him to be expressing his own view that we may reconcile empiricism and innatism—two traditions represented in this passage by Aristotle and Plato—by treating innate notions as "acts or operations" of the mind."[32] This means that Berkeley accept the empiricist stand that no ideas are innate, in the sense that they are statically impressed in the mind at birth and independently from its functioning, but he accept that some notions are not originated in sense-data but in the mind's acts or operations, i.e. in the respective cognitive processes. He differentiates between 1) "*passive objects*" of the mind which are originated from sense-data impressing the mind in a passive way, and what might call 2) "*active objects*" which are generated by the mind's acts and operations. In this context, 'notions' in Berkeley refers to ideas that the mind actively produce, not ideas formed via passive perceptions of sense-data. Consequently, in this context, we can interpret that "common notions," are ideas actively produced by the mind (not passively perceived via sense-data) which commonality is based on the commonalities of the human mind, brain, or cognition.

Thomas Reid opposed the empiricism (especially that of Hume). According to P. J. E. Kail, Reid argued "that key principles that govern human thinking cannot be derived from experience. Instead these are 'first principles or intuitive judgements', which he also calls 'principles of common sense' 'common notions' and 'self-evident truths' … [It is a] fact that all 'that begins to exist, must have a cause which produced it' He [Reid] takes this claim to be an a priori principle whose presence best explains 'the universal belief of mankind' in its veracity."[33] Thomas Reid, then associates "common notion" to "principles of common sense," "first principles," "self-evident truths," and "intuitive judgments." He bases his affirmation in the belief that all 'that begins to exist, must have a cause which produced it.' Hence there should be principles causing our thought and conclusions to exist.

Our conception regarding this issue, and what we are proposing, is that "innate principles" or "primary notions" are "common notions" but "common notions" ***are not necessarily*** "innate principles" or "*primary* notions." With this perspective, empiricists may affirm that "innate principles" or "primary notions" are not necessary to attain all knowledge while accepting the existence, usefulness, and even the communicational necessity of "common notions." Accordingly, "common notions" might be conceived as empirical products as well as a "primary notions" which support rational processes as the rationalists affirm. In our intellectual

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[31] Ibid.
[32] Ibid.
[33] P. J. E. Kail, "Hume on Efficient Causation," Oxford Philosophical Concepts, p. 26. Accessed on July 14, 2013 at http://sitemaker.umich.edu/efficient.causation/files/8-hume.pdf

perspective, the notion of "common notions" might have two main senses: 1) innate principles or ideas or primary notions which, as such, are the foundation of reasoning processes according to the Rationalists, and 2) empirically generated common notions which support the communicational process among human beings. In turn, the communicational process has two basic forms: self-communications (thinking, inferring, reasoning, etc) and communications with others (via common language, signs, notions, etc.). In both cases "common notions" are necessary (though not sufficient) condition for any communicational process. The first sense include the way the term is used in Euclid's '*elements'*, i.e. the one associated to the "principles" or "axioms" that constitute the bases of logical, mathematical, or geometrical discourse and the point of departure of their respective inference processes. In the second sense, the notion of "common notions" is what is empirically and commonly produced different human being cognitive processes in order to be able to communicate with oneself and with others. The notion of "common notion" might refer to thinking *principles* (departure elements which are at the beginning of rational cognitive processes) or to cognitive/linguistic tools supporting communications with one self (in thoughts, reflections, etc) and/or with others. With no common notions (ideas, concepts, etc) there would be no way to relate our past, present, and future thought, or to share information or knowledge with other human beings. Consequently, "common notion" are *necessary conditions* to 1) start thinking/cognizing and 2) to relate the cognitive processes we produce in different moments, and 3) to achieve an adequate effectiveness and efficiency regarding our communication with others. We think that with this notion of "common notions" we can avoid (i.e. dissolve though not solve or resolve) the rationalists/empiricists controversy regarding the *origin* of our ideas or knowledge. We might propose a *non-linear* cybernetic approach by means of which the problem of the origin of our cognitive content is not an issue any more as it is the case in *linear* thinking.

Notions and Language

We indicated above that Roland H. Kaschek affirmed that "Notions are considered as cognitive entities that function as representations of group of words,"[34] but we also pointed out that "A notion represented by a word or a phrase would refer to all instances in which the word or the phrase has been used." Consequently, one fundamental way of representing notions is by means of words and phrases (language) or other kind of external signs; but notions also represent words, phrases, language and, in general, signs. Notions are mental representation of our perceptions (including linguistic ones) and conceptions (concepts, ideas) and, in turn, language is one of the signs used to represent notions (mental representations). Consequently, there seems to be cybernetic loops relating notions and words, phrases, or signs in general. These cybernetic loops might be co-regulative (or co-corrective) ones, via negative feedback and feedforward, or co-amplificatory ones, via positive feedback, which might generate holistic emergent properties and synergies. Figure 1 is a diagram representing what we shortly described and proposed in this paragraph.

[34] R. H. Kaschek, 2007, op. cit.

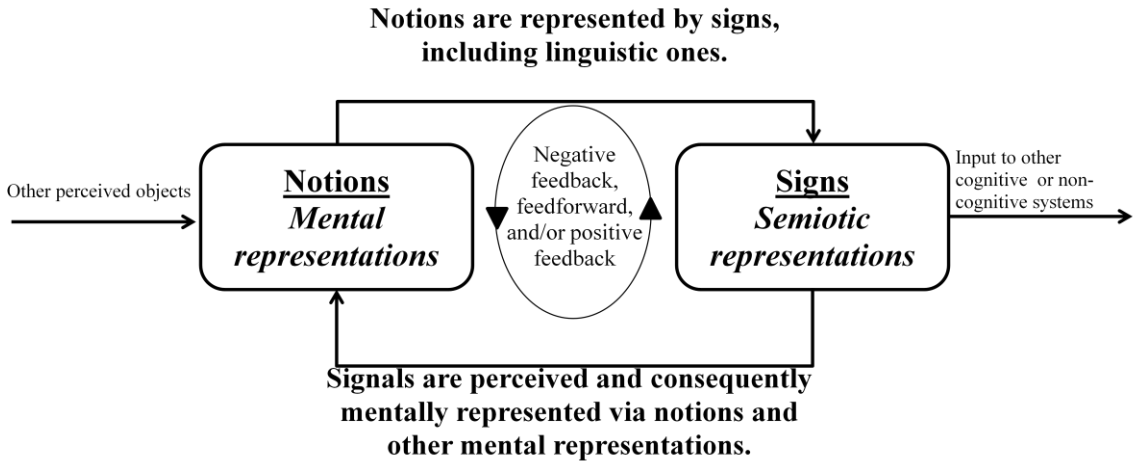

Figure 1

Some authors differentiate between perceptual mental representation and notions. Henry Wald, for example, affirms that "Whereas from the gnoseological point of view between perception and representation there is only a quantitative difference since, unlike perception, the representation mirror less individual features of things, between representation and notion there is a qualitative difference, since notion no longer reflects individual features of things. [Perceptual] Representations can only reflect individual features, whereas the notions only reflect the general ones. It is only though qualitative leap that knowledge can pass from sensory to logical."[35] Consequently, notions, as knowledge elements, qualitatively differs perceptual representations. A comprehensive meaning of notion as cognitive contents, or mental representation, would include perceptual and conceptual representations. Perceptual representations are produced by external sensory data generated by external physical objects while conceptual representations are generated by the cybernetic interaction between mental and semiotic representation which is product and cause of communication among human beings and self-communication (thinking, inference, etc.).

The cybernetic approach we are proposing (Figure 1) also supports the conception of meaning (what we are referring to with the words we are using) as a *recursive* process. Let us explain what we are trying to convey with a very illustrative text in which Edsger W.Dijkstra tried to explain the recursive nature of the identification of the object(s) referred by the words we use. Dijkstra affirms that

> Under regrettable circumstances I can truthfully make the statement: "My nose is bleeding.". Having only one nose I have identified the bleeding object considerably better than in a statement such as "My finger is bleeding.", the bleeding nose is even uniquely identified if ..... I were the only person or animal existing. This not being the case, the question "Which nose is bleeding?" can be

[35] H. Wald, 1975, Introduction to Dialectical Logic, John Benjamins Publishing; p. 74

> raised and the proper answer would be "Edsger W.Dijkstra's nose is bleeding.". Having a very rare Christian name I can safely assume that my name identifies my person uniquely in the population of this world, and my second statement then identifies the bleeding nose among the human noses of this world. Of course one can then ask "Which world?" etc. ***Our conclusion must be that identification is a process of a recursive nature, that names will only identify an object,*** provided it is known in which context this name is to be understood; in actual fact, each identification stops with the proviso "If you understand what I mean."[36]

Being the identification of an object and the meaning of a word or a phrase a recursive process, the meaning of any notion is also a recursive process which requires iterative descriptions and not static definition as it might be the case with some concepts. This one of the reason why we affirmed above that ***notions are usually described not defined***.

Topics to be covered in the next version of this document

- The Notion of Representation and the Representation of Notion
- Extending the cybernetic perspective of Figure 1 to include notional communication among human being
- Differentiating the use of notions in the contexts of disciplinary and inter-disciplinary communication.
- Relationships between the notion of "notion" and the notions of "denotation" and "connotation"
- Differences between the notion of "notion" and the notion of "concept"
- Can we apply "extension" and "intension" usually used in concepts definitions as part describing a given notion? Can we apply it to describing the notion of "notion"?
- Is every idea a notion? Is every notion an idea? What is common to both notions and what differentiate them?

[36] E. W.Dijkstra, *Context Dependent Names*, Transcribed by Mikhail Esteves, Last revised on Wed, 30 Jul 2003. Accessed on August 2, 2013 at http://www.cs.utexas.edu/users/EWD/transcriptions/EWD01xx/EWD155.html, and at http://www.cs.utexas.edu/users/EWD/ewd01xx/EWD155.PDF (Italics and emphasis added)