Phenomenon-based classifications and the epistemic fallacy: A reply to Thellefsen

Claudio Gnoli
University of Pavia, Italy

Dear Editor,

Recently, Thellefsen (in press) has critically discussed in this journal a review paper on phenomenon-based classification that I co-authored (Gnoli et al., 2024). While acknowledging the relevance of our approach for knowledge organization (KO), especially for its practical applications, he also finds that it implies an essentialist view, because of its design of assigning a unique place in a general scheme to each phenomenon, such as "water" or "family". Thellefsen believes that such essentialism would be inconsistent with the actual methods by which we identify and organize concepts of phenomena, based on researchers' consensus, which would make them still dependent on disciplinary research, despite the ambition to transcend disciplines. In his view, to take a trivial example, there cannot really be a concept of water as such, independent of the different disciplines that study water: there can only be water in chemistry, or water in hydraulic engineering, or water in economics, and so on.

I welcome Thellefsen's interest for discussing such issues, and agree with him that phenomenon-based classifications – like any other approach – should make their epistemological foundations explicit. Being the leading developer of what has recently described as their "most advanced—and most fully functional—example created to date" (Bianchini & Dousa, 2024), that is the Integrative Levels Classification (ILC), I take this occasion to shortly clarify its philosophical assumptions. Some of these are shared with similar phenomenon-based systems, such as Szostak's Basic Concepts Classification (BCC), though there are also some differences that I will mention towards the end.

As any classification system builds from some warrant, including literary warrant, cultural warrant etc. (Beghtol, 1986), what is the warrant of a phenomenon-based classification? The first broad classes in ILC, such as "stars", "organisms" or "music", have simply been taken from the personal knowledge of the editors, which is obviously related to common and learned knowledge in our contemporary Western culture (although the team has been including people from multiple continents since its early years, and is working on e.g. concepts from Korean culture, or Brazilian indigenous perspectives). Subdivisions and terminology, e.g. lists of star types or music genres, are usually derived from reference sources on the appropriate concepts, particularly English *Wikipedia*, so one could maybe say that we have a *Wikipedia* warrant. These sources can indeed be described as reflecting consensus of the international academic and educational community, already invoked by H.E. Bliss in his characterization of knowledge organization (Broughton, 2020, section 3.3.1.1).

For sure, such consensus is a result of disciplinary research and education (as well as interdisciplinary ones). However, this fact is true of any concept that is recorded and organized in most KO systems (KOS), and is not peculiar of any particular approach to KO,

be it phenomenon-based or discipline-based. The Dewey Decimal Classification or, say, the Art and Architecture Thesaurus may draw from academic consensus just as ILC, but this is not what makes them more or less discipline-oriented. (Of course there are legitimate alternatives to academic consensus, such as the New Age classification drafted by Langridge (1992) for the Avalon Library, but this is not the main point.)

The role of a KOS is to organize identified concepts according to certain principles. ILC does this according to the principles of levels of organization and of facet analysis. In another co-authored paper, Thellefsen appreciates ILC's "commitment to a layered, emergent view of reality" and suggests a parallel of it with Peirce's categories (Dewi et al. 2025); I will not discuss it here. As remarked by supporters of domain analysis, different systems prioritize different characteristics of division (Ørom, 2003). For example, they may prioritize genealogy over morphology to classify organisms, or religion over language to classify ethnic groups. As a general principle, phenomenon-based classifications prioritize the discussed phenomena over the disciplinary approaches by which they are addressed, so that a document is understood as being about "water" before being one of chemistry or engineering or economics (which can still be specified by an additional facet).

Of course the sciences – taken in the broadest sense, including social sciences and humanities – are an endeavour of human beings. As such, they are also affected by social dynamics such as ambition, prestige, academic competition etc.; but the concepts identified after debate, peer review, criticism etc. are an emerging intellectual product that has its own independent properties transcending individual researchers, as shown in Hull's monumental work and also discussed elsewhere (Hull, 1990; Gnoli, 2025a). Even when arosen in a particular academic school, scientific concepts have to be reconnected to the whole of knowledge if they are to be accepted by the international community. Thellefsen cites Bhaskar's critical realism, which addresses the apparent paradox that such "transitive domain" of socially-developed scientific concepts reflects the "intransitive domain" of external reality (Bhaskar, 1997). This is indeed a useful distinction for our discussion and also an appropriate characterization of human search for general schemes of phenomena.

Now, according to Thellefsen, the fact that concepts are based on consensus would not allow to identify any definable place for them in general schemes. The water of the chemist would not be the same one of the engineer or the economist – which makes one wonder why they use the same word at all. Cannot different disciplines refer to one and the same phenomenon? I guess Thellefsen and me could agree that water produced in a laboratory reaction, water conveyed in a built pipe and bottled water sold in a shop all have the same properties, such as boiling point or electrical conductivity, and if very thirsty both of us would be happy to drink any of them. Research has identified water as an oxide, which makes it a good member of the class of chemical substances: most researchers would probably agree that in a phenomenon-based classification this class can work as its place of unique definition, as Farradane called it (Gnoli, 2025b). This does not prevent us from acknowledging and representing other perspectives on water, such as an engineer's or a theologian's ones, by using the notation for oxides as a facet of those for artifacts or spiritual symbols.

Attempts to assign an optimal place to concepts in a general scheme could be labeled as positivism only if they would naively pretend to stand as final representations of reality. Otherwise, such labelling would itself be a case of the epistemic fallacy identified by Bhaskar, that "occurs when the mediating structure, that is, the 'prism' of experience, becomes the ultimate object of our knowledge, rather than reality itself" as in Thellefsen's words. That concepts come from social epistemic processes does not make their content

illusory, or any science would be impossible. As remarked by Ferraris, accusations of positivism, a theory from two centuries ago, remind of populist politicians still evoking the ghost of communism decades after the fall of the Berlin Wall (Ferraris, 2014). We now have more epistemically sophisticated theories, including critical realism. Hopefully we are still entitled to develop ontologies, having overcome our "three-centuries old obsession with epistemology and skepticism" (Searle, 2010). There seems to be a delay in such passage in information science, as a result of its greater familiarity with research on social conditioning than with other fields of knowledge, like metaphysics or special sciences systematics.

Whether a realist foundation for ontological KO has to be "essentialist" (cf. Machado et al., 2023) depends on what one means by essence. Current knowledge has found that water is a chemical compound of hydrogen and oxygen rather than, say, a primordial element or a means for spiritual purification, so we could consider this as its "essence". Reflecting this in a KOS, however, is perfectly compatible with fallibilism, as new research may always find that things are different, like recently happened with Pluto's planet status (or that things are indeed as previously estimated, like happened with Higgs boson). We will be happy to update our phenomenon-based classifications accordingly. All this seems in agreement with critical realism, despite Thellefsen contrasts it with our approach.

Another interpretation of "essence", meant as an eternal nature, implies that classes would be fixed in time. Is water an eternally-existing class? There was a time in early cosmic evolution when water molecules did not exist yet, and we don't know about the future of the universe. The 3-dimensional essence of water, then, is not the same as its 4-dimensional essence. We probably need to consider classes in terms of temporal as well as spatial entities. In both ways, the key question is how to identify discontinuities among entities and to demarcate their borders. There is debate in philosophy of science on whether evolutionary entities, such as living species or languages, can be concealed with Aristotelian essentialism (Reydon, 2025). ILC's notion of levels implies a historical view of phenomena that can be described as genealogical classification (Gnoli, 2023): in this respect, it is not essentialist in the Aristotelian sense. Of course this means that ILC subscribes to the view of contemporary scientific consensus rather than e.g. that of creationism.

Both Thellefsen (in press) and Hjørland (in press) discuss the basic concepts approach, according to which phenomena may be represented by combining "basic" components or semantic "primitives". Actually, not all phenomenon-based systems are based on such primitives: while BCC declares to be in its very name, ILC is more enumerative in this respect, reminding of the difference between Dalgarno's and Wilkins' philosophical languages (Maat, 2004). In BCC one finds water among "molecules" at *MMH2O*, clearly a combination from hydrogen and oxygen (but also among "natural resources" at *NR3*). However, taking the logic of basic concepts seriously could lead one to represent hydrogen as proton plus electron, and proton in turn as up-quark plus down-quark, and so on in a potentially infinite regress. The key to solve this paradox is the notion of emerging levels followed in ILC. Water's unique definition is at the ILC level of chemical compounds, among oxides, and its notation *febb* only reflects this. Its dependence from hydrogen is recorded in a separate field for semantic factors, as a cross reference. In the same way, concepts at higher levels such as water pipes or water bottles may have references to *febb*, or use it in faceted compounds (notice, however, that faceting is not the same as combining basic concepts).

In conclusion, the approach of phenomenon-based classification is less naive than is depicted by calling it positivist or essentialist. A number of philosophical issues are indeed implied in it, as they are in discipline-based approaches, and answers can follow various

options. I thank Martin Thellefsen for rising some of these issues and stimulating us all to be more explicit about the epistemological and ontological foundations of our systems.

References

Beghtol, C. (1986). Semantic validity: Concepts of warrant in bibliographic classification systems. *Library Resources & Technical Services*, 30(2), 109-23.

Bhaskar, R. (1997). *A realist theory of science.* Verso.

Bianchini, C. & Dousa, T.M. (2024). Editorial Introduction: Ranganathan and his legacy: past, present, future". *Annals of Library and Information Studies*, 71(1), 3-8.

Broughton, V. (2020). Henry Evelyn Bliss. In *ISKO Encyclopedia of Knowledge Organization*, eds. B. Hjørland & C. Gnoli. https://www.isko.org/cyclo/bliss.htm

Dewi, A.N., Sørensen, B., & Thellefsen, M. (2025). Toward a Peircean-enriched phenomenon-based classification: ontological foundations and semiotic mediations. *Journal of Documentation*, 82(1), 120-135. https://doi.org/10.1108/JD-08-2025-0221

Ferraris, M. (2014). *Manifesto of new realism*. State University of New York Press.

Gnoli, C. (2023). Genealogical classification. *Knowledge Organization*, 50(7), 496-506. Also in *ISKO Encyclopedia of Knowledge Organization*, https://www.isko.org/cyclo/genealogical.

Gnoli, C. (2025a). Classification in the wider philosophical perspective of informational ontology, Lecture 2: Informational ontology. *Journal of Information and Knowledge*, 62(2), 83-96. https://doi.org/10.17821/srels/2025/v62i2/171794.

Gnoli, C. (2025b). Is an all-purpose classification possible? Insights from Farradane's approach to knowledge organization. *Synthese*, 205, article 177.

Gnoli, C., Smiraglia, R.P. & Szostak, R. (2024). Phenomenon-based classification: An Annual Review of Information Science and Technology (ARIST) paper, *Journal of the Association for Information Science and Technology*, 75(3), 324–343. https://doi.org/10.1002/asi.24865

Hjørland, B. (in press). Semantic primitives and compositionality: An Annual Review of Information Science and Technology (ARIST) paper. *Journal of the Association for Information Science and Technology*. https://doi.org/10.1002/asi.70011. Also in *ISKO Encyclopedia of Knowledge Organization*, https://www.isko.org/cyclo/primitives.

Hull, D. (1990). *Science as a process: An evolutionary account of the social and conceptual development of science*. University of Chicago Press.

Langridge, D. (1992). Bliss, the disciplines and the New Age. *Bliss Classification Bulletin*, 34, 8-13.

Maat, J. (2004). *Philosophical languages in the Seventeenth Century: Dalgarno, Wilkins, Leibniz*. Kluwer.

Machado, L.M.O., Martínez-Ávila, D., Almeida, M.B. & Borges, M.M. (2023). Towards a moderate realist foundation for ontological knowledge organization systems: The question of the naturalness of classifications. *Journal of Information and Knowledge*, 51(4), 969-86. https://doi.org/10.1177/01655515231160031.

Ørom, A. (2003). Knowledge organization in the domain of art studies: History, transition and conceptual changes. *Knowledge Organization*, 30(3-4), 128-43. Also in *ISKO Encyclopedia of Knowledge Organization*, https://www.isko.org/cyclo/art.

Reydon, T.A. (2025). Synchronic species aren't diachronic species: Why 3D/4D metaphysical equivalence fails for the case of biological species. *Synthese*, 206, article 118. https://doi.org/10.1007/s11229-025-05206-0.

Searle, J. (2010). *Making the social world: The structure of human civilization*. Oxford University Press.

Thellefsen, M. (in press). The elusive essence: A philosophical interrogation of phenomenon-based knowledge organization, *Journal of the Association for Information Science and Technology*. https://doi.org/10.1002/asi.70031