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What are the "elements" of a representation?

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A representation is usually described as an organized set of cognitive elements. But what are these elements? We discuss here the nature the "elements" of representations, starting from a seminal paper by Codol. Section 1 summarizes Codol's formalism to describe the content and structure of representations: representations are made of "cognemes". Section 2 demonstrates that cognemes, although necessary for description, cannot be considered *final* constituents of representations. Section 3 proposes rules of good practice to describe social representations.

REPRESENTATIONS AS ORGANIZED SETS OF COGNEMES

A representation is both process and content (Abric 1987; Moscovici 1976). As a process, it is a series of psychological operations (exploration, recognition, categorisation, sense-making etc…) addressing a given phenomenon, based on previous experience and properties of the subject's psyche. As content it is the result of that process in the form of some "presentation", or image: the-phenomenon-as-re-presented by the subject. A *social representation* (SR) is how a given phenomenon, or object, is represented in a population (Doise 1986; Jodelet 1989; Moscovici 1989). While there is general agreement on what SRs are ("common sense") their exact ontological status is still debated.

It is difficult to describe in a scientific manner such a complex object as a representation. While most approaches of SR agree on their dual nature (process and content), however they tend to describe the representation by their *content* only. To do so,

they construct it as a set of components; and, in the case of structural approach (Abric 1994), attribute some structure to this set by qualifying the elements themselves and their relations to other elements or to the set (e.g. core vs. peripheral elements). For instance, the representation of an ideal friendly group will be constituted of the following elements: *equality, friendship, common opinion*, the first two elements being part of the core: they are necessary to the recognition of the object (Moliner 1993, 1994).

The assumption that a representation is constituted of a set of elements comes unquestioned. Abric, after describing SRs by their functions (group identity, orientation of behaviour etc.) writes: "As defined, the representation is therefore constituted of a set of information, beliefs, opinions and attitudes regarding a given object. Furthermore, this set of elements is organized and structured." (Abric 1994, p. 19, our translation). The rest of this seminal book is precisely dedicated to exploring relations between the elements.

The paper "A Terminology Note on the use of some expressions regarding activities and cognitive processes in social psychology" (Codol 1969) of which a translation is included in this issue of PSR, by the late Jean-Paul Codol, addresses the issue of the structure of scientific modelling of representations. We will take Codol's approach as a starting point to address the issue of the nature of elements composing a representation.

In this seminal paper Codol reviews a vast number of classic psychological theories involving cognition (personality, attitudes, dissonance, perception, categorization, social representations, etc.) in an effort to map which vernacular concepts in each theory send back to similar phenomena in other theories, and to create a unified vocabulary. Hence the title "terminology note". In doing so, Codol demonstrates that most social psychological theories interested in cognition use in their models, under various names, some kind of elementary unit of content, of information. These cognitive elements are the smaller units of these theoretical constructs. Codol proposes to clarify this situation, by calling:

- *"cogneme"* the smallest cognitive unit[1],
- *"cognitive universe"* the organized set of all the cognemes of a given subject,
- *"cognitive structure"* the rules of interdependency and organization of cognemes in a cognitive universe,
- *"representation"* a subset of the cognitive universe which refers to some form of interdependency between the cognemes of a given subject in relation to a specific object,

[1] The paper was written in an era when structuralism was blooming and linguistics had a strong influence on all social sciences, and the term cogneme has some analogy with "phoneme".

- *"structure of the representation"* the rules of interdependency and organization of cognemes in a representation.

Codol's paper bravely addresses a major issue: *what* are psychological theories in fact talking about in terms of *content*? By stripping theories from their specific jargon, Codol's intention was to get a clearer idea of the frameworks behind their vernacular discourse. His analysis does catch indeed the molecular approach to modelling that lies behind most psychological theories.

In this unified formalism, SRs can be considered as composed of elementary units, connected by (mental) associations. And indeed, the framework thus defined can be considered as seminal to what we now know as the "structural" approach of social representations, developed by Abric and collaborators (Abric 1987, 1994; Flament 1994). This approach was heavily influenced by the similarity analysis developed by (Flament 1962, 1981, 1994) and used by Codol himself. All these researchers come from the same famous laboratory in Aix-en Provence (France), the home of SR structural approach.

While structural approach does not qualify the nature of association links, other theories in the same vein, like "SCB"- schemes cognitifs de base (Guimelli 1994; Guimelli and Rouquette ; Rouquette 1994)- attempt to do so. In practice, most current descriptive theories of SR tend to be molecular, explicitly or implicitly. They search for specific nodes, or *elements*, usually in discourse or word associations, through qualitative analysis or statistical investigation. Then they describe the representation as a compound of these elements, and therefore can be seen as variations on the molecular model formalized by Codol. In this respect they follow, as most other psychological theories, the natural slope of symbolic modelling, which tends to describe anything as a combination of basic elements.

Codol attempts to give an explicit definition of "cognemes", but this definition remains vague, and this has not alas been clarified by more recent literature. Cognemes, as well as "elements", are an undefined and property-less token. Their only use is to be a general name for the content items put forward by the analyst, and determined in practice by the specific investigation technique used (items from close-ended questions, most frequently cited words in open-ended questions, names given to classes in cluster analyses, thematic nodes in content analysis etc.) The ontological nature of cognemes remains unspecified, or rather: almost anything can be a cogneme.

What boils down from this is that descriptions of representations, and structural theory in particular, are molecular in form but hardly specify the nature of the atoms that constitute these molecules. And by the way, are these elements atomic?

COGNEMES ARE NOT ATOMIC ELEMENTS

Describing representations as an organized set of cognemes, as a word would be an organized set of phonemes, seems to imply that this description is unique and that cognemes are the elementary bricks of human thought. Such is not the case.

The idea that the world would be decomposable in a finite set of discrete elements, which dates back at least to classic Greek philosophy and has influenced in its time many sciences (Physics, Genetics and Linguistics being the most prominent examples) has proven to be a dead-end. While this approach is natural to human thought and maps well with language as a discrete system of description of phenomena, empirical investigation quickly demonstrates its limitations.

Let us take again this example of "the ideal group". Is *"equality"* an atomic element? No. In the online Swiss Dictionary of Political Science, at the entry *social representation*, Patricia Roy precisely takes "equality" as an example of social representation (Roy 2011). Equally, *friendship* and *community of opinions* are in fact complex notions, which are themselves social representations. And therefore are constituted of more cognemes. Etc. The molecular model of representations crumbles in our hand, as cognemes dissolve in ever more cognemes. The contour of what we describe is defined by the resolution of our description system.

Fractal theory, developed by (Mendelbrot 1983), provides an illustration of this complex epistemological issue. If we want to map a territory, say Britain, the edges of this territory as traced on the map at the scale 1000 000:1 will have a complicated contour, which maps the contour of Britain at the resolution of a satellite view. But more local and detailed maps will always keep a similar level of complication in the contours. In practice, the resolution of our descriptions does not map the actual contours of the object, but rather it maps the resolution of our description system. So what can be the "smallest element" is defined by the resolution of our pen, rather than by the structure of the phenomenon itself. What is true of contour is also the case for the nature of the elements of a description –see also (Reinert 1998) on that issue.

Subjects, when asked to describe their representation of an object, spontaneously tend to answer in terms of content. The elements of the set we scientists use to describe the representation are either the very terms used by subjects, or more usually some reconstruction by the researcher who comes up with a one-fits-all word/item to account for the diversity of answers (Lahlou 1995a). But words are not the final definition level of reality, they do not map with elementary objects: rather, language is a network where each term is defined by other terms (de Saussure 1972 (1915)), in a rhizome kind of way. There is no end to definitions of representations, at some point they become circular. For example, eating has been described as constituted of 6 elements (Lahlou 1995b) one of which is “meal”. *Meal* includes elements such as “cutlery”. While the analysis has not been pushed further, it is obvious that cutlery includes *forks*. And it is most likely that *forks* include “eating” as an element of their representation.

If we want to track down representations into elementary units, at some point they will dissolve into neural networks. To take again the example of maps, at some level in scale, the very notion of “contour” of the object vanishes. The contour of “the coast” at the scale of 1:1 map becomes difficult to describe (should we trace the contour of sand grains and small rocks?) because “the coast” is a descriptive concept valid at a larger scale only. Models are valid only at a given scale. Not only is this true for individual representations, but it is even truer for SRs, which, as they are statistical constructs referring to a population, can afford no clear-cut definition.

Another issue is that cognemes may be polysemic. For example, in studies on social representations of speed driving, the term "danger" comes out. But this element has two completely different meanings, depending on the population studied. For some "danger = hazard = be careful", while for others, "danger = risk = sensation seeking.

AIMS AND LIMITATIONS OF COMPOUND DESCRIPTION

Decomposing a SR into elements is a way to understand its nature in relation to these elements. This is a *description* of the phenomenon, and not its final decomposition into atomic units. Let us insist on this, because while we have always been careful to present structural theory as a *description* system, some authors tend to take the structural approach for an *ontological* theory of SR, which it is not. For this reason, one must remain cautious

when using such a description as the basis for analysing the structure of the SR (defined as the relations between cognemes, and between cognemes and the SR).

Even though, as we have just illustrated, it is tricky to use cognemes to describe representations, *we have no other choice* because this is the way humans make descriptions: with signs, elements referring to other objects. As (Codol 1969) aptly writes : “When one represents something, it is always in reference to something else”.

But the nature and contour of elements themselves are influenced by the investigation method, and by the choices made by the researcher when subsuming empirical data into “elements”. This is obvious for example, regarding the elements which remain “hidden” with classic techniques of interview. The elicitation of the elements is completely dependent on the context within which the data collection is done. As shown by the recent work of the structural approach of the Aix school, some elements of the representation, some cognemes, can remain "hidden" because they could undermine the positive self-image that the subject wants to give to the audience (Flament, Guimelli and Abric 2006). In this process some "contra-normative” cognemes” may not be verbalized by subjects, hence the question asked by these authors: what is the “actual representation”?

The representation is therefore not necessarily actually covered by the cognemes collected by conventional methods. There may be a "silent zone" of social representations, requiring new data collection methods (Abric 2003).

This should not stop us, however, from using a molecular approach for description, as anyway scientific description is always subject to “Damastism”, the influence of the researcher in the construction of data (Lahlou 2011). Physics was the first natural science to face the issue directly. The first models described that matter was made of atoms (from the Greeks to Niels Bohr). Then quantum theory blew up this simple model (Heisenberg 1927). Let us note, though, that at some level, atomic theory is still useful nowadays, especially in Chemistry.

In other words, any scientific description in general is only a means to an end. It does not need to account for the ontological nature of the phenomenon described. No one would pretend that the maps are the territories themselves, and in that sense all maps can be criticized as arbitrary, approximate, and “false”. However they remain useful.

Such is the case with our “cognemic” descriptions of SRs. We must simply be careful not to reify the description and always remember that it is a *description*, and not a list of the ontological constituents of an SR.

Also, not all elements are equal, as structural research shows; it is necessary to investigate how general, how solid, is each element used, and its functions in the representation, which is precisely what structural approach aims to do. Indeed cognemes can be of different *nature*: some are merely *descriptive* of the object, while others evidence a relationship to the object that depends upon on a value system: the latter are *normative*.
Moreover, the same cogneme can come with different structural statuses, it may, for example, appear central or peripheral, and hence play a very different role in the meaning of the representation. The cogneme itself does not provide sufficient information on the meaning of the representation. Its nature and status are essential, just as its presence or absence in the representation.

How far should we go in the detail of elements? This depends upon the goals of the description. What do we use scientific description for? To transfer into this description previous knowledge obtained independently about its elements. In the case of SR, we are often interested in what a given object is connected with, because this points at which other phenomena or objects should be taken into account in research or action. And this is in fact what association techniques provide: the associated objects, rather than the constituents of the representation. We may also be interested in studying the variation of a SR within a population. Or to know what are the relevant elements, to understand the structure in the perspective of understanding its function; or what aspects of the representation are more resistant to change (the "core"). Comparing the associations or descriptions over time or over subjects is then a good approach, and there using cognemes in description seems appropriate.

CONCLUSION

Describing SR as a set of cognemes is a useful and natural approach which is fit for most purposes. Nevertheless, as this remains a *description* and not a final ontological decomposition of the SR's structure into atomic components, one must remain aware of the influence of the researcher in the construction of this description. Such description can be the basis to explore the structural or functional nature of the representation to the cognemes used in its description; and to take into account the status of the cognemes in the structure. Therefore, the compound description with cognemes is a good start to the study of a representation, but certainly not an end.

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