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From Central Core Theory to Matrix Nucleus Theory

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ABSTRACT

The strong consensus generated by core elements of a representation and their meaning making function in the theory of core nucleus raise many questions. Answering those questions reveals some contradictions within the theory. These contradictions can be overcome by appealing to "matrix nucleus theory".

Keywords: *central core theory; structural approach; matrix nucleus.*

Nucleus theory (Abric, 1976, 1993) is a theory about the structure of social representations (SR). It rests on the assumption according to which every SR, independently from its target social object, is composed of a dual system of information, opinions or beliefs. The main function of this double system is to maintain a representation's stability among the sharing group. That means keeping stable the assigned meaning to the object by group members.

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In this paper, we will discuss two points. The first one has to do with the strength of observed consensus regarding a SR's core elements. The second one deals with their meaning making function. As we will see, some limits within central core theory emerge from answering those questions. But these limits seem surmountable if one considers a recent extension of the theory, which proposes the concept of "matrix nucleus" (Moliner, 2007; Moliner&Martos, 2005).

CORE NUCLEUS THEORY

The notion of core nucleus is directly taken from that of illustrative scheme, but has more to do with the contents of stabilized representations. In its primary form, central core theory (Abric, 1976, 1993) offers considering representation as a ranked set of beliefs which comprise peripheral elements that are organized around a nucleus. On the formal side, nucleus is made of a restricted number of relatively stable beliefs through time, around which strong group consensus is observed. Conversely, peripheral beliefs are numerous, unequally shared between group members and vary upon time frames.

The nucleus has three structuring functions: A *meaning making* function: The nucleus generates or moderates meaning of all other representational elements, and, in the end, a representation's global meaning. Here, core elements would play a part similar to that of "central traits" suggested by Asch (1946) in his work on other-perception. Let us remind ourselves of the fact that, to this author, the impression we form about a person is organized around particular traits that moderate the meaning of all other traits attributed to that person. For instance, attributing someone the trait "cold" or "warm" leads us to giving a specific meaning to all other traits we might attribute him. And finally, if we do not form the same general impression of a "warm" and "meticulous" person versus a "cold" and "meticulous" one; it is because the polarized set "warm-cold" moderates meaning of the trait "meticulous". In one case we can guess meticulousness filled with good intentions, in the other we dread that behind meticulousness lurks some form of darkness. An *ordering* function: The nature of connections between elements of a representation is determined by the nucleus. This second function is derived from the first one (meaning making). In fact, if one assumes that core elements can moderate the meaning of peripheral elements, then one can understand the connections between

two peripheral elements as depending on the core elements which make sense out of them. A *stabilizing* function: nucleus is at the same time the most stable and resisting part of a representation. This function is derived from a combination of the two former functions with the consensual nature of core elements. Indeed, these core beliefs are widely shared; they give meaning to all other elements of a representation and determine their ordering. Consequently, modification of these beliefs induces high psychosocial and cognitive costs. At the cognitive level, all transformation of core beliefs triggers a global change of a representation's meaning. At the psychosocial level, this transformation holds important risks of breaking down in group consensus and therefore social bonds. For all these reasons, theory predicts a strong resistance to core beliefs change.

Two properties distinguish peripheral elements: On one hand, they are beliefs which take root in concrete and personalized experience. Indeed, they depend on core elements, but reflect the life experience of individuals. For instance, the notion of hierarchy within the representation of Business World (Moliner, 1993, 1996) is identified as central. In this sense, every Business is thought of having a ranked organization. But, depending on individuals, the experience of hierarchy can vary. To some, it is embodied in the image of a "boss", to others it is a "management committee" or an "administration board". On the other hand, peripheral elements are conditional beliefs (Flament, 1994a). Still referring to the representation of Business World for instance, the notion of "profit" is also identified as central. But the profit made by a company is rarely visible in its raw form. Most often, it is only perceivable through such cues as advertisement done by the company, the more or less luxurious aspect of its premises, investments it realizes etc. In order that, depending on situations, individuals will consider that a firm makes profit if it advertises a lot, or if its premises are luxurious or if it made a lot of investments etc. On the expressive side, it is admitted that core elements generally have an abstract aspect (Moliner, 1988), are context-free (Abric, 1994), or make up elements which characterize the object (Flament, 1994b). They also are properties individuals assign to the object in a "non-negotiable" way (Moscovici, 1993). Conversely, peripheral elements rather express specific and situated experiences, which individuals associate to the object of representation in a conditional manner.

THE ISSUE OF CONSENSUS

The work of experimentally validating central core theory (Moliner, 1988, 1989) has allowed for significantly refining conceptions of core elements. In fact, this work shows that core elements hold symbolic connections with the object of representation. Hence, any mention of this object implicitly or explicitly activates core elements of its SR, while any activation of its core elements evokes the object. If, for instance, we are told of an activity that is "gratifying" and "temporary", we cannot know what activity it is or grasp the relation between these adjectives. But if one adds that this activity allows for obtaining a "degree", we can guess it probably refers to Education, and the link between the two former adjectives becomes clearer. This example, taken from research on representation of Higher Education (Moliner, 1996), well enough illustrates this idea of a symbolic connection between a social object and core elements of this object's SR.

Methods for identifying SR's core elements rely on this link. The "Refutation" method (Moliner, 1988, 1994), assumes that, within a group, *all* individuals refuse to acknowledge an object of SR if its description includes the negation of one of its SR core elements. The "Context-independence" test (Lo Monaco, Lheureux & Halimi-Falkowicz, 2008), assumes that *all* members the group automatically associate core elements to an object of SR. This is why both methods conclude a belief is central if, among a group, the proportion of refutations (with the refutation method) or of systematic associations (with context-independence test) is statistically equivalent to 100%[1]. Today, these two techniques are considered the most reliable for identifying an SR's core elements. However, they produce results that raise questions about the issue of consensus regarding core elements.

Likewise, in a study of SR of politicians (Brissaud & Moliner, 2004), we sequentially refuted 29 qualities that might potentially be attributed to them. Five core elements were then identified (see table 1). These five elements are considered central since, after their refutation in a character's description, subjects refused to acknowledge the target as a politician, all this in proportions that were statistically equivalent to 100%. But one must conceive that, among the studied group (135 Arts and humanities students), not everyone gave the same answer.

[1] Both methods use Kolmogorov-Smirnov tests to compare observed frequency to a theoretical frequency of 100%.

Table 1 *Politicians' Core characteristics*

Dedication	87,41%
Conviction	83,70%
Communication skills	88,15%
Ambition	86,67%
Seriousness	80,74%

For instance, 12.59% of the 135 subjects (16 participants), did not consider "dedication" a core characteristic and 19.26% of them (26 participants) think likewise when it comes to "seriousness". A strict acceptance of central core theory is therefore facing trouble. Indeed, respondents do not share exactly the same SR since some core elements to some are peripheral to others. In order to cope with this issue, one can be tempted to remove this minority of respondents from the sample. But, to get there, one was forced to remove 67 participants from the original sample. Furthermore, this issue was not solved since some items that were initially peripheral became central (see table 2). Obviously, one could want to further decrease sample size. But it can easily be understood that, in doing so, there would not be many subjects left, and emergence of new core elements would also be likely. To put it shortly, one can see that, contrary to central core theory's assumptions, core elements are not "non negotiable" beliefs to everyone.

Table 2 *Politicians' core characteristics (after decreasing sample size)*

Dedication	100,00%
Conviction	100,00%
Communication skills	100,00%
Ambition	100,00%

Seriousness	100,00%
Tries to transform the situation	82,00%
Has a clear line	82,00%
Owns up what his opinions are	79,00%
Intelligence	76,00%
Energetic	75,00%
Pronouced political committment	75,00%

In order to solve this contradiction, we thought about submitting Refutation questionnaires to Boolean analysis (Flament, 1996). After a conventional analysis, based on the use of Kolmogorov-Smirnov tests, those participants who considered as central at least one element considered central by the group are counted. Flament demonstrated that such a way of proceeding yields a 100% rate of subjects considering at least one element of the nucleus as central. In our sample, 100% of participants regard as central at least two out of five characteristics from table 1.

THE ISSUE OF MEANING

Despite the above-mentioned difficulties, central core theory appears nowadays as a really efficient conceptual tool for studying social representations. However its rooting in the notion of the illustrative model (Moscovici, 1961) raises other questions about the meaning making function of central elements.

The first of those can be found in the work on SR of psychoanalysis. Let us remember that, in this founding study, Moscovici (1976) identified 4 key notions (the unconscious, the conscious, repression and complex) making up the representation's illustrative model. But he noticed that these notions had an "informative value without having a precise meaning" (Moscovici, 1976, p.241). With regard to the word "complex" he added: "None of the people we questioned were able to tell us what they meant by complex". Thus, elements from the illustrative model appear quite empty of proper meaning. To Moscovici, it is precisely this

characteristic which allows for their association to a host of other words and their symbolizing of the representation's object, which is "emptied of all accuracy, for complexity is a source of symbolic exactness" (Moscovici, 1976, p.244). In other words, if elements of the illustrative model underlie elements of the nucleus, we must admit these acquire a specific meaning during the genesis of an SR, which will allow them to generate the global meaning of that SR.

The second question paradoxically comes from studies which were carried out on the basis of the refutation method (Moliner, 1988, 1994). In fact, in order to explain obtained results through this method, we evoked the symbolic value of core elements (Moliner, 1994). We were therefore referring to the properties of elements from the illustrative model. In other words, results that were obtained through the refutation method can be interpreted without reference to the meaning making function of core elements.

The third question was raised by numerous results demonstrating the associative capacity of core elements (Guimelli, 1993; Rouquette et Rateau, 1998). Indeed, these studies showed that subjects have less trouble perceiving verbal associations with core elements than with peripheral ones. Yet, this result can only be explained by appealing either to the strong 'polysemous' nature of core elements or to their absence of specific meaning. In the first case, one can admit that these elements fulfill a meaning making function but this is harder to admit in the latter case.

Bataille's suggestions (2002) contributed to this discussion from a novel perspective. This author indeed regards core elements as polysemous, but their meaning is defined by peripheral elements. This conception reminds us of Flament's observation (1994, p.85) who stated 'the workings of the nucleus can only be understood in continuous relation with the peripheral'. Put another way, those concrete and situated peripheral elements would be the ones moderating meaning of abstract and symbolic core elements. Core elements would then allow individuals to define the object of representation with the help of common words, thus providing an illusion of consensus, but allowing for varied interpretations according to contexts and individual experiences. For instance, we can all acknowledge that "wage" is essential for characterizing "work" activity, but we might well perceive radically different realities behind the word "wage", according to our own experiences. In a nutshell, according to Bataille, core elements would be meaning receivers, not makers. In a series of experimentations (Moliner &Martos, 2005), we actually showed that peripheral elements had the most stable meanings, for

both SR of Higher Education and SR of Group. Conversely, the meaning of core elements could vary depending on their connection to other elements.

MATRIX NUCLEUS THEORY

This theory was build up in an effort to overcome the difficulties we have listed. Far from being opposed to central core nucleus, it simply proposes to accurately describe the traditional functions attributed to core nucleus. Therefore, instead of meaning making, ordering and stabilizing functions, we suggested those of *denoting, aggregating* and *gathering*.
The first nucleus' function would be one of *denoting,* which would rest on core elements' symbolic properties. The nucleus would then provide verbal labels allowing individuals to mention or acknowledge the object of representation without using costly speeches or in-depth analyses. But the crucial point here would be more the informative capacity of those verbal labels than their inherent meaning. As noted by Moscovici (1976), terms like "the unconscious" or "complex" are distinctive of psychoanalysis even if individuals do not have a clear picture of their specific meaning. But "the word's role during communication is what makes its value" (Moscovici, 1976, p.241). In other words, core elements would be markers, enabling individuals to locate their discourse among specific "worlds of opinions". For instance, the word "degree" which is used with regards to education probably denotes, among students, a certain kind of education (institutionalized) and indicates thereby the exclusion from discourse (or thought) of other types of education. From our point of view, much research using the method of refutation constitute as many empirical examples of nucleus' denoting function.

The nucleus' second function would be that of *aggregating*, and is directly linked to the high semantic potential of core elements. Indeed, these quite ambiguous elements (when it comes to their specific meaning) would allow individuals to gather, under the same word, different and situated experiences. For instance, the pair "work/wage" actually evokes a certain kind of work (denoting function) but the term "wage" can reflect very diverse realities (money income, exchange of services, declared or undeclared revenue etc.). In other words, core elements would be "… semantic and thought categories – collective ones indeed- able to filter facts and guide observation of concrete events" (Moscovici, 1976, p.240). To us, studies that used methods of core identification in combination with factorial or classification analyses

(Guimelli, 2003; Moliner, 1995, Tafani& Bellon, 2001) provide many empirical examples of nucleus' *aggregating* function. In fact, these studies show us that core elements never cluster on the same factor or in the same category. On the contrary, they usually occupy the whole of obtained vectorial or classification spaces. It is as though the connections between some core elements and clusters of peripheral ones were stronger than those between core elements.

The third nucleus' function would be that of *gathering*, which is derived from its former functions. By offering the group imprecise elements of characterization, the nucleus would provide a common matrix allowing each and every one to mention the object of representation, while allowing various individual experiences to co-exist. Thus, members of a given group would possess a consensus generating and individual-difference integrating conceptual framework. In fact, if knowing all the words of a given language is unnecessary to use it, likewise it is not necessary for all members of a given group to agree with every core element of a SR. To us, the above mentioned works of Flament (1996, 1999) are illustrative of the nucleus' *gathering* function.

CONCLUSION

If one looks closer, SR theory has always been a structural theory. In Moscovici's propositions (1961), the concept of field already implied a certain ordering of opinions and beliefs. Later on, the concept of « thêmata » (Moscovici & Vignaud, 1993), assumed some "basic principles" to order SR' contents, according to universal dual relations (male vs. female, inside vs. outside, cause vs. consequence etc.). In much the same way, the core/peripheral dichotomy proposed by Abric was a new way to conceive the ordering of information and beliefs within a SR. But, even if important and essential, this work of conceptualization has often neglected the fact that, within a SR, individuals are the ones to bear out the observed relations between information, opinions and beliefs.

For example, as part of the central core theory, when mentioning the "structure" of RS, we often tend to forget that the structure is a collection of beliefs and people, and that these people build links between the beliefs. In a way, matrix nucleus theory tries to reemphasize this issue in our questioning and works about SR. But, by doing so, it goes further and reverses it because it suggests that opinions or beliefs can be as many bonds between people. Hence, we go

from a perspective regarding individuals as establishing links between various beliefs (i.e. the notion of field) to a perspective where one can assume that beliefs draw connections between people. It might be now useful to go back to the language metaphor. Is it essential that two people master every word of a language for them to communicate? Obviously not, since it suffices for their respective semantic class to crossover, even partially, for them to understand that they are speaking the same language. Going further along with the metaphor, we can therefore argue that SR are languages that social groups construct to think and talk about society. Among these languages, matrix nuclei play a specific role because those elements that compose them denote a social object, while drawing connections between individuals.

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