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Context Effects and Inter-Representation Activation: An Experimental Study

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The paper concerns the study of structural relations among social representations. Departing from the assumption that social representations are interconnected forming representational systems, the research aim was to verify if context salience of a cognem from one social representation is associated with a higher activation rate of a cognem from another representation within the same representational system. The rationale is inspired by Moliner's studies about context effects, social images and representations. After conducting exploratory surveys, an experimental study was carried out with a sample of 72 Italian undergraduates who completed a questionnaire. The main manipulation consisted in emphasizing or relativizing the content of one peripheral cognem from the representation on health through a text. The basic cognitive schemes (SCB) valences of two cognems from the representation on aging, which had been identified as part of the same system, were assessed. In the emphasis condition, the descriptive valences of both cognems related to aging were higher when compared to relativization. The results provide empirical evidence of the effects of one representation over the activation of another one by means of a context effect, suggesting that research on cognem-to-cognem relations might inspire useful models on inter-representation relations.

The structural approach to social representations is concerned with the systematic description of the knowledge structures that are shared by groups and the processes involved in the

organization and transformation of such knowledge in everyday life. Rouquette and Rateau (1998) stress that a structural perspective aims at formulating models that are not restricted to a single context, but can rather be generalized across different social representations or social representation classes; a search for invariance has priority over content specificity. Some of the main topics of interest for that perspective are the nature and components of social representation structures, the relationship of social representations and social practices, the dynamics of social representations and the activation of representations by context (for a review, see Wachelke, in press-a).

This paper reports an empirical study about relations among social representations. More specifically, it is concerned with the mechanisms and formalization of how an aspect of a social representation can activate aspects of other social representations that are connected to it. Structural social representation studies are usually concerned with the within-representation level – i.e., the description of a social representation through a list of components, also called elements or cognems, but research directed toward relationships between representations is considerably less abundant. Before presenting the research problem in more detail, we would like to clarify the definition of social representations and social representation elements to be followed in the text, as well as a convention to refer to such elements.

BASIC DEFINITIONS: COGNEMS AND SOCIAL REPRESENTATIONS

From a structural perspective, a social representation is a structured set of cognems linked by relationships among themselves and also to a social object; both the cognems and the relationships are legitimated within a social group (Flament & Rouquette, 2003). A cognem is another way to refer to a cognitive element or unit. This term has been coined by Codol (1969), who defined a cognem broadly as the most basic unit in a theoretical system about cognition. In social representations research, it is usually considered that a cognem corresponds to a basic concept, usually a noun or verbal sign (Lahlou, 1996).

Recently, we proposed to consider a cognem as a minimal symbolic relationship. It is usually the relationship between a verbal sign and its meaning. However, in social representations research, it is more useful to take the verbal sign relationship for granted and approach a cognem as the relationship between a social object and one of its aspects (Wachelke, 2012).

A structure called triplet can be employed to refer to a cognem. A triplet is comprised of two aspects linked by a relationship. It is formalized as *A c B,* in which *A* and *B* are aspects and *c* is a relationship connector of any kind. The Basic Cognitive Schemes model (Guimelli & Rouquette, 1992), also called SCB from the original French acronym *Schèmes Cognitifs de Base*, is basically a list of 28 connectors, e.g. implying definition, causation, qualities, subordination, among others, grouped according to logical similarities.

Most often, in research that deals with representations as sets of cognems, when we refer to a social representation element, we are actually referring to a triplet but not mentioning its connector – for example, when we refer to "hierarchy" as an element of the representation of the "firm", we are referring to an *A-B* "biplet" (social object: *firm* - aspect: *hierarchy*), actually a triplet in which the "-" means that any SCB connector could be included.

Finally, since we will refer to various social representations and elements, both of which are labeled by verbal signs, we will adopt a conventional way of referring to them. For disambiguation, social object labels will be written between square brackets - [ ] - while angle brackets - < > - will be employed to refer to social representation elements, eventually with a hyphen connecting the *A* and *B* terms of the biplet, similarly to the convention employed by Wachelke and Contarello (2010).

The activation of cognems can be assessed through total and partial SCB valences, which are measures of activation that are already established in the literature. Empirical SCB tasks involve questionnaires in which research participants assess independently if 28 relationships between a social object and an aspect of it are pertinent or not. The total valence is the proportion of activated connectors in relation to the total number of assessed relationships. Partial valences are the proportions associated with subsets of connectors related to specific families (Guimelli, 1995; Guimelli & Rouquette, 1992). Rateau (1995) grouped the 28 SCB connectors in three of those families, which he called meta-schemes, according to the broad relationship types that the connectors referred to. So the meta-schemes are Description (descriptive relationships, such as synonyms, definitions…), Praxis (practical relationships involving tools, actions, actors…) and Attribution/evaluation (causality and conditionality relationships). Now we can move on to a brief review on inter-representation relations that will lead to the research problem.

SOCIAL REPRESENTATION SYSTEMS

Each representation is inevitably connected with other social thinking formations, and that is already a first possibility of conceiving the relations involving social representations. If we have a representation of the [house] that has a central element <house-doors>, then the understanding of that element is certainly associated with another representation or symbolic construct that provides the basic concepts and characteristics of doors or similar things. It can then be easily perceived that, in this sense, every representation forms vast networks with other representations.

Contributing to the theory about relations among representations, Flament (1994) suggested that some representations might have similar contents and characteristics when they are trespassed by common values. That might explain, according to him, why social object labels and cognems have similar contents. As an example, the representations of [work] and of the [ideal group], two object labels referring to human relations, are mentioned. <Friendship> is a part of both structures, but is central in the latter and only a peripheral element in the former.

In a similar direction, Rouquette (1994a) advanced a position that states that social representations are diacritical, and therefore they provide the criteria to classify the objects into categories and also establish relations among them, constituting a higher-order structure comprising the links involving different representations. Various expressions have been employed to name those representation sets: representational field (Bonardi, De Piccoli, Larrue & Soubiale, 1994), constellation (De Rosa, 1995), representation family (Milland, 2001) and representational system (Garnier, 1999). We will use from now on one of the terms employed by Garnier (1999): representational system. The study of inter-representation relations in systems has been the focus of a few studies, structurally oriented or not (for a brief review, see Camargo & Wachelke, 2010, pp. 24.3-24.5).

There are two likely factors that make the existence of social representation systems necessary. One of them is a matter of coherence of the social thinking architecture. If it is considered that the logic and basic characteristics of social thinking processes are directed by frames of reasoning that emerge from the organization of the society of masses (Flament & Rouquette, 2003; Rouquette, 1988, 1994b), then it is a derivation of that assumption that social representations have to ‘make sense’ among themselves in order to provide an overall reading grid of social events that is compatible with the constraints from ideological levels.

The second factor is the complexity of social reality itself, which often demands the joint play of different social representations to make sense of everyday events. In that sense, there are objects that are not directly associated with a single representation structure, but are related to two or more social representations, which are activated according to situation demands (Flament, 1987; Milland, 2001). In addition, the consequence of the anchoring process - meaning that the contents of one representation associate it with other representations that make sense of those specific elements - also makes it clear that representational systems form second-order structures in which a transformation in one part might be associated with transformations in other connected representations.

If social representations maintain relationships among themselves forming a system, it is important to be able to characterize those relations in structural terms. There is a recent and productive line of research that focuses on that theoretical problem.

INTER-REPRESENTATION COORDINATION

Flament and Rouquette (2003) classified the structural relations among social representation into two broad types: field effects and coordination. The first type comprises the case of peripheral modulation in social representation structure associated with higher-order social thinking formations, such as ideologies or *thêmata*. The authors illustrate field effects through representation differences associated with gender – such as a representation of the [male nurse] compared with the [female nurse]. The differences are found in peripheral elements of those representations, and are therefore minor ones. Anyhow, due to the source of relationship being a superior instance and not another social representation, we may refer to field effects as vertical relationships.

We are especially interested in coordination relations, because they are horizontal: two social representations, i.e. two formations from the same level in the architecture of social thinking (Rouquette, 1996) that have at least one association in their structures. The case involving the existence of intersections of verbal signs referring to social representation elements or social objects is called conjunction when the intersection targets the central cores of the coordinated representations (Flament & Rouquette, 2003).

Research on coordination relationships has privileged conjunction configurations, and so far three types have been identified. Embedding or dependency is the relation in which one social representation contains in its core the verbal sign that labels a superordinate

representation, and in turn the superordinate representation has a peripheral element that labels the inferior object, as in the case of the representations of [money] (superior), [bank] (middle) and [profit] (inferior) (Abric & Vergès, 1996). An antinomy or opposition relation identifies the case in which the two social representations have the same themes in their cores, which take opposite meanings. This pattern is found in the relationship between the social representations of [security] and [insecurity] (Guimelli & Rouquette, 2004) as well as [work] and [unemployment] (Milland, 2002). Finally, when the object labels of two social representations are present as verbal signs in their central cores, two representations are said to be in a reciprocity relation; this has been identified in the relationship between the representations of [work] and [money] (Abric & Vergès, 1996).

If we take the basic cognitive schemes model (Guimelli & Rouquette, 1992; Rouquette, 1994a) into account, a first formalization of a coordination between two social representations is, then, the existence of a relation between two social object labels, in a conventional SCB triplet: *A c B*, where *A* is a social object label referring to social representation 1 (R1), *c* is a connector or a class/family of connectors contained in an SCB model, and *B* is a social object label referring to a second social representation (R2). When the activation of at least one connector in this kind of triplet involving social object labels has certain intensity, then it can be said that two social representations are coordinated; we speak of an object-to-object (OtO) relationship. In this sense, existing OtO relationships correspond to coordination relations between social representations. Although Fraïssé (2000) did not use such terms to qualify her research effort, it was her study that introduced the assessment of OtO relationships through SCB connectors, by evaluating the activation of single connectors linking [official medicine] and [alternative medicine]. Later, Stewart and Fraïssé (2006). assessed OtO relationships between the representations of the [mad cow disease] and [beef].

CONTEXT EFFECTS AND INTER-REPRESENTATION COORDINATION ACTIVATION AT THE LEVEL OF COGNEMS

There is much pertinent information that is necessary to characterize an inter-representation relationship that is not conveyed by OtO relationships. If a social representation is itself a structure composed by small units, each of them being a relation involving the social object label and another verbal sign that designates another object – that is, each unit is a cognem – it is important to retrieve a coordination relation also at the level of the cognems of each

structure. The OtO connection must correspond to one or a set of relations at a "micro" level of the structure consisting of cognems and their relations. By characterizing a cognem-to-cognem (CtC) inter-representation relation, a researcher would be able to identify exactly which aspect from a social representation is associated with an aspect of a second social representation, try to sketch the logic or sense behind that coordination, and eventually plan interventions to transform each representation or the relationship between them; the identification of inter-representation relations at the level of cognems would provide very valuable information.

One way of assessing an inter-representation CtC relation could be to verify if, when we change the intensity of activation of a cognem from R1, there is also a change in the activation of a second cognem from a second representation, R2. In common language, it would mean that when think more or less about something, there would be a correspondence in how much we think about something else that is linked to it.

This can be verified through empirical research. If relationship intensity is operationalized through the measurement of SCB valences, then the activation of the R2 cognem could be easily assessed. But how to manipulate the intensity with which the R1 cognem is activated?

Flament and Rouquette (2003) referred to context effects as circumstances that affect the expression – in other words, the activation – of social representations. It is already documented in the literature (Abric & Guimelli, 1998; Guimelli, 1995, 1996; Rouquette & Rateau, 1998) that certain characteristics of a situation – whether social practices or constraints in an immediate context – contribute to higher or lower activation relative to a social representation element. If that is the case, then a suitable way to capture CtC relations could be simply to induce a context effect related to the R1 cognem, and then observe if a change in its activation is associated with a change in the activation of an R2 cognem that is supposedly connected to it.

A rationale very similar to this one, but involving a different level of social thinking relations and also other formations from the architecture of social thinking was employed by Moliner (1996) to study the influence of social representations in the activation of social images. The author induced a context effect through photographs suggesting to university undergraduates the themes of the [firm] or [family vacation], and observed that each condition was associated with different judgments of a target person presented in a standard picture; activating one representation or the other was associated with the activation of different

images of that person. Likewise, we believe that a context effect (in our case, induced by different discourse tasks) making an R1 cognem more or less salient might be associated with varying activation levels of an R2 cognem that is connected to the first one. If they are somehow related, then it does make sense that activating one should somehow affect the other in a way that is empirically observable.

We have then planned and carried out an experimental study with the aim of verifying if context salience of a cognem from one social representation is associated with a higher activation rate of a cognem from another representation within the same representational system. Prior to describing the main study, we will report briefly the results of a few preliminary exploratory studies that allowed us to have a baseline characterization of one representational system and select the representations and cognems to work with.

PRELIMINARY STUDIES: STRUCTURAL CHARACTERIZATION OF REPRESENTATIONS AND RELATIONSHIPS

In order to construct an experimental design suitable to verify if context effects are associated with inter-representation coordination activations, we first needed to have a characterization of the structural status of elements from two social representations of a same system, perceived by participants as being mutually related.

We have decided to work with a representational system centered on the social representation of young adults about [aging]. The topic justifies its status as a social representation object due to being a grand social theme that has been the focus of communication throughout history, related to key issues such as death and time, with intergroup differentiation in terms of age groups – the beliefs shared by young and elderly people about aging are different (Wachelke, 2008). Moreover, aging and other related objects – such as old age and elderly people – have already been studied according to a social representations perspective (Gaymard, 2006; Magnabosco-Martins, Camargo & Biasus, 2009; Moliner & Vidal, 2003; Veloz, Nascimento-Schulze & Camargo, 1999). For instance, Wachelke and Contarello (2010) showed that in an Italian convenience sample, there were statistical differences in terms of the representations shared by young and the elderly in terms of [aging]: older participants share a more normative representation and consider that <death> and <social exclusion> are central elements, aside from <general decline> and <family life>, which are also shared by the young.

In order to sketch the representational system, we asked 151 Italian undergraduate students to indicate the proximity of [aging] with seven other objects[1] in a scale of 1 (very distant) to 4 (very close). The mean relative to the perceived distance of [aging] and [health] was 3.42, which is significantly higher than the intermediate value of 2.5 [$t(150) = 13.983$, $p < .001$; $d = 2.28$]. This information indicates that the two objects are likely to be related and coexist in a representational system. [Health] is also a social representation object that has inspired scientific studies (Herzlich, 1969; Nascimento-Schulze, Garcia & Arruda, 1995).

After a literature review and 12 exploratory interviews conducted in Italy, we formulated items related to cognems of the social representation of [aging], and for the present study two cognems were retained: <general decline> ("to age is to lose physical and mental capacities") and <illness> ("to age is to face health problems and illness"). A sample of 102 Italian undergraduate students was submitted to a classical procedure for structural characterization: centrality questionnaires following the calling into question (*mise en cause*) principle (Moliner, 1989; 2001a). Such tasks involve asking participants if they consider that a social representation object still keeps its identity if an element is not present; for example, if we refer to a fictitious social representation of [birds] and an element <feathers>, we would ask participants, "is an animal without feathers a bird?". A strong proportion of negative (rejection) responses by participants would indicate that <feathers> is an essential element of the social representation, i.e. a central element. <General decline> had a rejection rate of 68.6% and < illness> had 61.8%. If, as suggested by Flament (1999) and Milland (2002), a cut-off proportion of 75% to indicate the central status of an element is adopted, then both elements are characterized as being peripheral[2].

Based on the results of prototypical analysis about the social representation on [health], some items relative to elements were formulated. We have retained the element <medical care>, a peripheral cognem according to the results of a questioning task ("can we say that a situation is related to the health of a person if medical care is not involved?"): its rejection proportion with another sample of Italian undergraduate students (N = 68) was 47%.

That particular cognem of [health] is pertinent for our purposes because participants from that sample were also asked to evaluate pairs of cognems from different social

[1] The following objects were included in the study: [health], [death], [work], [body], [family], [time] and [wisdom].

[2] When allied to fair sample sizes, the adoption of a fixed cut-off proportion to distinguish between central and peripheral elements, independently of null-hypothesis statistical testing, is stable and makes comparisons across studies simpler. For a more detailed justification of that criterion and a comparison with other ones employed in the literature, see the footnote of the Results section in Wachelke (in press-b).

representations, one of them being a cognem from the representation of [aging] while the other one was a cognem from another element that might be related to it. They had to decide whether the two elements of each pair (each expressed by an item in affirmative form) had some kind of association or not. The cognem <medical care> of the representation about [health] had an interesting situation, as more than half of the sample declared that it had a relationship of some kind with the two elements of [aging] that we mentioned: a proportion of 69.1% declared that there was a relationship with <general decline> [Yates χ^2 (1) = 9.20, p = .002], while 66.2% perceived the existence of an association with <health problems> [Yates χ^2 (1) = 6.48, p = .011].

EXPERIMENTAL STUDY

Method

Design

Taking into account that the preliminary studies pointed out that Italian undergraduates perceived a peripheral cognem from the social representation of [health], <health-medical care>, as being related to two peripheral cognems from the social representation of [aging]: <aging-health problems> and <aging-general decline>, we chose to include the [health] cognem as the one to be manipulated due to the fact that, it being a peripheral element, it is more prone to influence from context salience effects, which makes it appropriate to our study. Central elements are usually stable and impervious to context effects (Guimelli, 1995; Lo Monaco, Lheureux & Halimi-Falkowicz, 2008), and then would probably not be affected by the planned manipulation.

The social representation of [health] was then R1, and [aging] was R2. The study had two independent variables, constituting a 2 x 2 design. The first independent variable (R2 cognem) consisted of the different elements of [aging] that had their activation rates (valences) measured. Modality 1 referred to <aging-general decline> and modality 2 was <aging-health problems>.

The second independent variable was situational context. The first modality was called Emphasis: it favored the expression of <health-medical care>. The second modality was Relativization, which proposed to activate alternative aspects of the social representation on [health], through a relativization or “weakening” of the content of the manipulated cognem.

The dependent variables were the activation proportions (valences) relative to the R2 cognems, encompassing both the total set of SCB connectors (total valence) and separate meta-schemes (partial valences).

Participants

A total of 72 undergraduates from the University of Padua (Italy) composed the study sample. The majority of them, 60 (83.3%) were women. Participants' ages ranged from 18 to 28 years old, with a mean of 20.35 years (*SD* = 1.75) and a median of 20 years. There were 37 participants randomly assigned to the Emphasis condition and 35 to Relativization. Each participant provided responses for two experimental conditions related to the same modality of the Situational context variable, i.e. each participant assessed the valences of the two R2 cognems, adding up to a sample size of 144 cases. While the responses are not truly independent concerning such variable, it is common practice in structural studies of social representations for a single participant to evaluate various social representation elements separately.

Instrument

A questionnaire in Italian was employed for data collection. There were 4 versions of the questionnaire, as the orders of evaluation of the two R2 cognems in instrument were balanced in order to reduce possible presentation order effects.

The first page of the questionnaire asked the participants to read an excerpt attributed to an Italian newspaper website (www.corriere.it), and then answer a question. The excerpt was a fictitious text that reported the results of a European interdisciplinary project (named Eurohealth) active for over 20 years, which aimed at monitoring the changes in conceptions about health in 15 European countries. An aspect of the recent results obtained with an Italian sample was reported, and then the professor in-charge of the Italian section of the project commented on it, justifying and explaining the results.

The logic behind the task was to attribute a certain conception of health to a majority of the fake Italian sample, inducing the participants from our study to conceive it as a social representation element. The comments of the project coordinator should give credibility and sense to the reported data. The question that should be answered by participants was

constructed in a way that would privilege them to justify and explain the pattern of results presented in the text. That was then the induction of context salience related to the R1 cognem (<health-medical care>). Participants would read a text that was to be taken as an indication of a shared position in their group (the Italians, in this case), and were then asked to produce discourse to back it up or react to it. Agreeing with it or not, we expected participants to at least activate more the <health-medical care> cognem in the case of Emphasis, in which the content relative to it would be stressed, and less in the Relativization, in which other aspects would be privileged in the excerpt text.

In the Emphasis condition, the data from the Eurohealth survey supported the content of the cognem <health-medical care>. It was stated that 68% of the participants from the Italian Eurohealth survey had declared that going to the doctor regularly to prevent and treat illness and other problems was the main procedure to be healthy. The coordinator's comments justified such belief. The question that participants should answer started by stating that the text indicated that appointments with health professionals and access to medical care are essential to have a good health condition, and then inquired why medical care was seen as important. Participants were asked to justify their responses writing a small text of around 5-10 lines.

In the Relativization condition, it was stated that 68% of the participants from Italian Eurohealth survey had declared that physical exercises and healthy eating habits were more important to maintain good health than going to the doctor regularly or undergoing medical care. The results were also justified by the coordinator. The question directed to the participants first stated that the appointments with health professionals and access to medical care were not very important, and then asked participants to explain why medical care was no longer seen as essential. The full text relative to the Emphasis and Relativization scenarios are presented in the Appendix.

In the following two pages there were two forced association SCB tasks (Fraïssé, 2000; Milland, 2001) in which the participants should indicate the existence or not of the 28 SCB relations activated by the two R2 cognems. Both R2 cognems were present in the instrument, with balanced presentation orders across questionnaires. Each task was introduced by a short sentence in affirmative form presenting cognem content in common language. For <aging-general decline> it was: "aging can be characterized by the loss of physical and mental capacities", while for <aging-health problems> the statement was "aging can be characterized by illnesses and health problems". The SCB triplets had "aging" as the *A* term

and “loss of capacities” and “illnesses” as *B* terms, respective to each of the R2 cognems. The response modalities for each of the relations were the standard ones employed in SCB tasks: “YES” (existence of a relation), “NO” (non-existence of a relation) and “?” (uncertainty or doubts concerning the existence of a relation).

In the last page of the instrument there were calling into question items (Moliner, 1989, 2001a) destined to assess the structural status of the three cognems as a baseline check. Item text and response options were as follows: <health-medical care>: “Can we say that a situation regards the health of a person, if it does not involve medical care?”; <aging-general decline>: “Can we say that a person is aging if s/he is not losing physical and mental capacities?”; and <aging-health problems>: “Can we say that a person is aging if s/he is not facing health problems?”. Response options were: “certainly yes”, “probably yes” (acceptance responses), “probably no”, “certainly no” (rejection/refutation responses).

Procedure

Questionnaires were administered in university classrooms by the researcher. They were shuffled, so as to distribute questionnaire versions randomly to participants.

Data analysis

The calling into question items for the three involved cognems had their distribution compared across conditions by means of chi square tests, in order to verify if the structural statuses of those cognems were similar to the ones observed in the preliminary studies and also stable across conditions. The four response options for the calling into question item were dichotomized into acceptance and rejection responses relative to the reading grid linked to the social object that the items referred to, just as in usual questioning task procedures. The rejection proportion of 75% was adopted to differentiate between central and peripheral status.

As some sort of manipulation check to ensure that the participants really emphasized or relativized the content of the R1 cognem in the discourse task, the content of responses was coded in one of three categories, in terms of their prevailing tones. A first category was related to content that developed the position that medical care is important for health, a second one expressed the position that life style is important for health, and a third one

referred to a balanced view of the importance of both medical care and life style for the maintenance of health. The frequency distributions of those responses across situational context conditions were compared through a chi square test.

Finally, log linear analyses (saturated model) were conducted to assess the effects of the two independent variables in the activation of basic cognitive schemes. Log-linear analysis is a pertinent technique because it makes it possible to evaluate factorial designs with qualitative variables, assessing effects and interactions expressed by the Likelihood ratio chi square measure (Y^2) - a statistic similar to Pearson's chi square – interpreted in a way that is very similar to the *F*s in factorial ANOVA (Howell, 2001). Scheme activation was the dichotomous dependent variable for all analyses, taking values "No" (aggregation of "No" and "?" responses) and "Yes". Separate analyses were conducted at two levels of analysis: 1. full SCB questionnaire activation, including all connectors; 2. separate basic cognitive meta-schemes (description, praxis and attribution). Analyses consisted in the calculation of the effects and parameters of the saturated model with a Microsoft Excel-based program for the analysis of three-way tables (Sanchez-Peregrino, 2008)[3]. The number of cases in each table varied accordingly with the number of connectors, multiplied by the total number of cases. For the overall SCB set there were 4032 cases, for the Description meta-scheme set there were 1296 cases in the table, 2728 for Praxis and 1008 for Attribution.

Hypotheses and expectations

There was one single general hypothesis related to the effect of the Situational context variable. It was expected that the Emphasis condition would cause a higher activation of the R1 cognem, and, given the connection that it has with the R2 cognems, there should be a corresponding increase in activation in the valences of the cognems related to [aging], in comparison with the Relativization conditions, in which the content of the R1 cognem is weakened. The hypothesis can be written as:

Hypothesis: SCB activations associated with the R2 cognems will be higher in the Emphasis condition than in the Relativization one.

[3] Since log-linear analysis makes no differentiation between dependent and independent variables, the researcher should restrict the interpretation to effects including the dependent variable of the study – i.e. the main effect of the dependent variable in the design, and the first and second order interactions which include that variable.

Given the absence of an explicit mention of the inter-representation CtC relation, we would expect small effect sizes. Additionally, we expect to find a significant effect in the total set of SCB connectors and also at least one effect relative to partial valences, but we have no prior expectations concerning which one would be affected by the manipulation.

Results

Structural characterization

The results for the calling into question task relative to <health-medical care> confirmed its peripheral status, as only 27 participants (37.5%) chose rejection responses. There was no difference between the two situational context conditions [Yates χ^2 (1, N = 72) =.093, p = .761].

The two R2 cognems had rejection rates that confirmed their peripheral status (lower than 75%), although a fair proportion of participants attributed symbolic value to them. <Aging-health problems> had 47 (65.3%) rejections responses, a proportion that was nearly identical in both situational context conditions [Yates χ^2 (1, N = 72) = 0, p = 1], and <aging-general decline> had one more rejection response, and a proportion of 66.7%, which also did not differ between contexts [Yates χ^2 (1, N = 72) =.174, p = .677].

Cognem activation

It was observed through the results of content analysis that the two situational context instructions led the participants to stress opposing views on their responses. In the Emphasis condition, 34 participants wrote mostly about how medical care is important for health, no participant commented on a superior importance of lifestyle and exercises, and 3 participants had a balanced view of the importance of lifestyle and medical care. A reverse pattern was found in the Relativization condition: 23 participants privileged the importance of exercises and life style, 8 had a balanced view of lifestyle and medical care, and only 4 addressed medical care as being essential for the maintenance of health. The difference in response distribution across conditions was a significant large effect [χ^2 (1, N = 72) = 48.94, p < .001, V = .82].

The response distribution relative to the full set of SCB connectors is presented in Table 1, while the results relative to the effects of the saturated model are given in Table 2. It can be observed that other than a significant global effect, there are three significant associations. The first one is a general trend of a higher occurrence of non-activation

responses, in comparison with activation ones (z = 22.17, p < .001). This effect bears little interest to our study, and was observed also at the level of meta-schemes; it will not be addressed further.

Table 1. Contingency table containing the response distribution relative to the activation of the full set of SCB connectors

	Situational context				
	Emphasis		Relativization		
R2 cognem	No	Yes	No	Yes	Total
<general decline>	636	400	626	354	2016
<health problems>	736	300	734	246	2016
Total	1372	700	1360	600	4032
	2072		1960		

A significant first-order interaction between the R2 cognem variable and Activation indicated that there were more activation responses for <general decline> - 37.4% (z = 7.01, p < .001) than for <health problems> - 27.1%. The most interesting effect, however, was the first-order interaction between Situational context and Activation, which had the direction predicted in the hypothesis. The activation proportion in Emphasis - 33.8% - was slightly higher than the one observed in the Relativization condition - 30.6% (z = 2.21, p < .05). This result indicates that the degree with which the R1 cognem is activated is directly associated with the intensity of activation of both R2 cognems that are supposedly connected to it in the representational system, at the level of the whole set of SCB connectors.

Table 2. Saturated log-linear model for the full set of SCB connectors

Effect	Y^2	*df*	*p*
R2 cognem	.000	1	1.000
Activation	519.858	1	< .001
Situational context	3.112	1	.077
R2 cogn. x Activation	49.275	1	< .001
R2 cogn. x Sit. cont.	.000	1	1.000
Activation x Sit. cont.	4.641	1	.031
R2 cog. x Act. x Sit. con.	.049	1	.485
Global	577.373	7	< .001

After observing the existence of an effect in terms of total valence, it is important to assess if it is related to an overall trend or if it is linked to a specific partial valence. For the Praxis meta-scheme, the only relevant effect consisted of an effect linked to the activation proportion of the R2 cognems [Y^2 (1) = 8.659, p = .003]. There was a higher activation proportion of <general decline> - 33.2% -, compared to the activation of <health problems> -

26.7% (z = 3.01, p < .01). The interaction between situational context and activation was non significant [Y^2 (1) = 2.296, p = .130]. The same pattern was observed for the Attribution meta-scheme. Once again, the only pertinent effect was the interaction between the R2 cognem variable and Activation [Y^2 (1) = 4.698, p = .030]. The activation proportion for <general decline> - 45.8% - was higher than the one for <health problems>, 39.1% (z = 2.17, p < .05). The interaction between activation and situational context was non significant [Y^2 (1) =.007, p = .931].

The general effect was explained by the Description meta-scheme. The same effects found for the whole set were found for Description; this means that the associations found for the full set of connectors were due to the weight of descriptive connectors. Table 3 presents the distribution of responses for that meta-scheme, while Table 4 reports the results of the log-linear model.

Table 3. Contingency table containing the response distribution relative to the activation of the connectors from the Description meta-scheme

	Situational context				
	Emphasis		Relativization		
R2 cognem	No	Yes	No	Yes	Total
<general decline>	199	134	213	102	648
<health problems>	267	66	263	52	648
Total	466	200	476	154	1296
	666		630		

<General decline> had a higher activation proportion - 36.4% - than did <health problems> – 18.2% (z = 7.19, p < .001). The interaction involving activation and situational context, which supported our hypothesis, was also identified. The activation proportion taking both R2 cognems into account was 30% for the Emphasis condition and 24.4% for Relativization (z = 2.15, p < .05).

Table 4. Saturated log-linear model for the Description meta-scheme

Effect	Y^2	*df*	*p*
R2 cognem	.000	1	1.000
Activation	276.780	1	< .001
Situational context	1.001	1	.317
R2 cogn. x Activation	54.916	1	< .001
R2 cogn. x Sit. cont.	.000	1	1.000
Activation x Sit. cont.	5.100	1	.024
R2 cog. x Act. x Sit. con.	.423	1	.516
Global	338.219	7	< .001

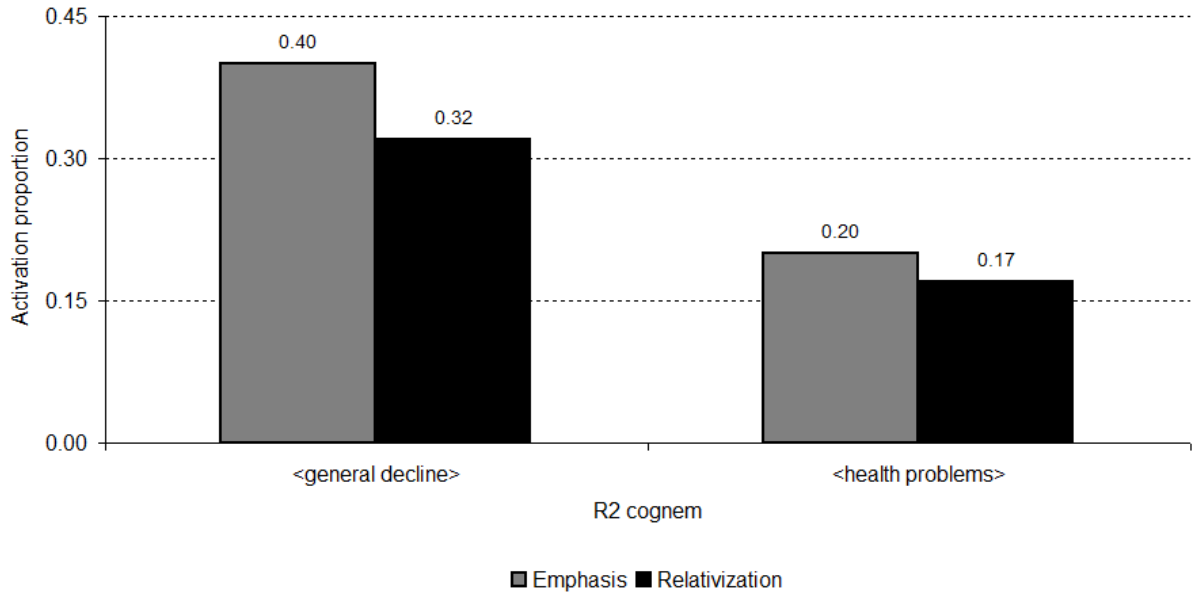

Figure 1. Activation proportions relative to each R2 cognem for the Description meta-scheme connectors, by situational context

Figure 1 illustrates the activation proportions for each R2 cognem. The interaction between situational context and activation can be observed, as the same pattern of higher activation for the Emphasis conditions is valid for both cognems.

DISCUSSION

The results from the experimental study suggest that when people are subjected to context salience effects linked to a peripheral element from a social representation (R1) that is part of a representational system, activation salience might be associated also with the activation of cognems from another social representation from that system (R2). This effect, in spite of its small magnitude, is the first evidence, to our knowledge, of the empirical retrieval of CtC relations.

Even if the notion of representational systems has been present in the literature for some time already (Bonardi et al., 1994; Garnier, 1999), to date structural studies about inter-representation relations had identified element or object label intersections (Abric & Vergès, 1996), OtO relations (Fraïssé, 2000) and themes that are common to two or more representations (Guimelli & Rouquette, 2004; Milland, 2001, 2002). But none of them had captured the existence of a relation between two cognems from different representations

dynamically. As such, the existence of inter-representation relations was more of a hypothesized mechanism or association that had not been actually observed, but only inferred. This is the first study that demonstrated the effects of one representation over the activation of another, at the level of their cognems, in action. It is a first example of how representations in a same system interact, giving support to the notion of representational systems as higher-order knowledge structures.

It is interesting to note that the logic of context effect induction to assess the activation of a second instance, inspired by Moliner's study (1996), has then been proven useful concerning inter-representation relations. It does seem to qualify as a suitable rationale that can be fruitfully employed across components of various social thinking formations, and then serve as a paradigm of a whole class of research projects focused on the activation of cognems or other constructs in general.

There is evidence that suggests that the status of the manipulated element might be important to predict inter-representation activation. The reported results pointed in the direction of the identification of inter-representation activation, but it must be reminded that the manipulated R1 cognem had a peripheral status. In a very similar manipulation with a different Italian sample, Wachelke (2011, p. 171-172) worked with different connections between representations of [family] and [aging] that were also supported by preliminary studies. A central cognem of the representation of [family], <support> was manipulated in a scenario that resembled the Eurohealth one but referred to a fictitious Eurofamily instead. In the case of that study, the Emphasis condition stated that most Italians believed that the family was the main source of support for people, whereas the Relativization condition brought fictitious data that reported that people would rely mostly on their friends and no longer on their families as their main sources of support. Dependent variables were the valences related to two R2 cognems of [aging]: <family life> and <new activities>. At the occasion, it was observed that, in spite of the fact that the proposed task did activate differently the R1 cognem, the inter-representation activation did not take place.

One possible way to explain that involves having in mind that the effect that was found in the study reported in the present paper is small, indicating a subtle action of R1 activation over R2 in the employed paradigm. It is documented in the literature (Guimelli, 1995; Lo Monaco et al., 2008) that central elements are resistant to context effects. If central elements do resist context changes, then a transitory situational condition is not likely to stir an association including the central element undergoing the context effect; the association

itself might be stable and context-resistant, when analyzed in the sense of context changes linked to R1, and the manipulation can be ineffective to promote the emergence of an activation effect.

It is also important to point out that the paper only presents results limited to one representational system and a few social representations. Although we tried to focus on the structural nature of the elements and relationships involved, it is a restricted context that still does not allow us to generalize the identified patterns as structural regularities. It is desirable to replicate those results or design studies based on similar principles with other social representations and systems, possibly linked to classical objects for basic research, such as the [ideal group] (Guimelli & Rouquette, 1992; Moliner, 1989), the [firm] (Moliner, 1993), or [higher studies] (Moliner, 1996). Only through a systematic identification of patterns that are independent of content will it be possible to arrive to solid structural laws (Rouquette & Rateau, 1998).

Moreover, if inter-representation CtC relations can be identified empirically, then research trying to refine the understanding that we have of related phenomena is needed, as well as theoretical models that can be submitted to verification. The consideration of CtC relations might contribute to open new possibilities of research to tackle the yet unexplored terrain of coordination relations concerning disjoint social representations.

Flament and Rouquette (2003) referred to that case in their classification as associations between social representations that do not involve central core intersections in terms of verbal signs labeling cognems or social objects. However, if the literature on structural relations among social representation is examined, one realizes that little attention has been given to coordination relationships involving disjoint representations. An intersection at the level of central core elements or social representation object labels makes the study of structural relations more straightforward and easier to operationalize, as the associations linking disjoint representations are of an indirect nature and to be found elsewhere rather than at the verbal signs of structure labels. That is probably why research on conjunction was conducted first; it was the logical step to make to start tackling the topic of social representation relations. But the mere fact that it is also explicit in Flament and Rouquette's classification (2003) that some representations are related to each other even being disjoint that makes our current understanding of inter-representation relations insufficient. A model that is common to joint and disjoint social representations in

coordination is needed, describing relations at the level of cognems independently of specific intersections.

A first effort in that direction has been proposed by Wachelke (2011, p. 175-202). The existence of links between elements of different social representation at the level of cognems makes it possible to postulate inter-representation connection points, which can be formalized also as triplets composed by the two cognems from the different social representations and a relationship between them, i.e. a relationship or class of relationships just like the connectors or hyperconnectors of a basic cognitive schemes. Such inter-representation connector would work as a bridge relation enabling the knowledge domains of the two representations to communicate and serving as the main mechanism of representational systems.

Research that tries to characterize interconnected social representations gains by opening new levels of structural descriptions. Are representations within a system activated or transformed independently or as a cohesive set? In which conditions? Also at this higher-order structural level it is possible to identify elements, relations and transformation laws, respecting Piaget's guidelines (1968) for a structural approach.

Additionally, the reported results and the conceptual contribution of inter-representation connection points and activation have clear implications for basic and applied research. The current position in the field is that when it happens that the structural role associated with a cognem does change – i.e., a central, stable element becomes peripheral, or the other way around – then we say that a transformation has taken place. In this sense, social representation transformation is a specific case of social representation cognem activation linked to a radical change in status. Understanding and bringing about change of representational knowledge are two of the main interests in the field, and certainly those that are closer to application; this is why the field has developed strongly according to different field and experimental paradigms (Guimelli, 1989; Moliner, 2001b; Mugny, Moliner & Flament, 1997). It is then evident that one of the research lines that could benefit more from the findings of our research is the one linked to social representation dynamics, aimed at studying the transformations that social representations undergo, both “naturally” (Moliner, 1998) and through deliberate social influence (Mugny et al., 2009; Souchet & Tafani, 2004).

Up to this point, researchers have been interested mostly by single representations. In terms of experimental change, the most successful procedures had participants doing tasks – the operationalization of social practices – that contradicted one cognem (let us call it R1 cognem), or proposed persuasive communication settings that did the same thing.

If we know that the R1 cognem that we want to change is in a connection point with a cognem from another representation (R2 cognem), another possibility emerges: to try to change the R2 cognem, and thus try to bring about indirect change into the one from R1. As an illustration, let us take the example of Pianelli, Abric and Saad's research (2010) that showed evidence that the social representation of the [LAVIA], a device responsible for speed control in cars introduced in France, is linked to drivers' representations of [speed] and [speed limitation]. If those representations are associated by means of connection points, then a transformation in the social representation of [speed] would probably be linked to a compatible change in the representation of the [LAVIA]. Further possibilities that could be speculated involve not the increase or decrease of activation intensity of a cognem, but an effort to change the connector relationship of a cognem.

Finally, and more critically, while the model for inter-representation activation and the notion of connection points and bridge relations are perfectly compatible with the main assumptions and theoretical positions of the structural approach, one cannot help but notice, as already pointed out by Parales Quenza (2005), a striking resemblance of the field with social cognition. More specifically, the structural approach is a perspective that conceives social representation structures similarly to the associative networks that are very typical of cognitive social psychological research. Additionally, the notion of activation practiced in structural social representations research is interchangeable with the activation of schemes from social cognition. In the case of inter-representation activation, the involved phenomena would possibly be well explained with the aid of priming processes (for a review on priming, see Sedikides & Skowronski, 1991). The adoption of an individual level of analysis by various structural approach experiments – concerned with personal interpretation of social representation elements or social representation transformation – also contributes to bring the approach closer to social cognition. If, on the one hand, it is not expected that findings from the two perspectives contradict each other if they deal with similar phenomena, on the other hand the "convertibility" of the structural approach into social cognition can be seen as problematic, because it would mean that the social representation notion is not necessary to explain such phenomena; social cognition has a very dense and coherent body of research and conceptual grid already.

The concepts, methods and results developed in this paper are all derived from and perfectly compatible with previous theoretical and empirical work offered by the structural approach. They are, in a way, a natural progression of the knowledge hitherto constructed and

formulated, which has focused mainly in cognitive processes and structure. The finding that the outcome has a considerable overlap with a more parsimonious proposal from the social cognition perspective might serve as a warning sign: should not the structural approach reevaluate its focus and conceive the notion of structure more broadly? An exclusive focus on cognition gives little attention to key aspects in the study of social representations, such as the group and social processes. The structural approach would probably benefit from a theoretical and methodological reformulation, giving more emphasis to social dimensions, such as the social construction of knowledge (cf. Parales Quenza, 2005), or a shift to a more normative view linked to social identity (cf. Wachelke, 2012). It is perfectly legit to emphasize the study of cognitive processes also in social representation phenomena, but only through the widening of its scope will the structural look on social representations distinguish its unique contribution.

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APPENDIX 1

Scenario text for the two Situational context conditions (translated from Italian)

Emphasis

The following text is part of news published on the website www.corriere.it in December 2008. Read it carefully and answer the questions:

... Eurohealth is an interdisciplinary European project that has been active for twenty years and follows the changes in health conceptions in 15 European countries. The most recent data obtained from the Italian research group, coordinated by Prof. Roberto Fontana, from the Psychology Department of Milan University, show that 68% of the near 1200 surveyed participants declare that regularly going to the doctor to prevent and treat illnesses and other problems is the main measure to attain good health.

Prof. Fontana comments: "Medicine is advancing very fast, and people tend to seek its services to ensure a healthy life more often than in the past. The data from the last Eurohealth demonstrate that, for most Italians and European, specialized care provided by doctors and nurses are essential for good health".

The text indicates that appointments with health professionals and regular access to medical care are important for one to have good health. Why is medical care seen as important? Justify your response, writing down a brief text (5 to 10 lines).

Relativization

The following text is part of news published on the website www.corriere.it in December 2008. Read it carefully and answer the questions:

... Eurohealth is an interdisciplinary European project that has been active for twenty years and follows the changes in health conceptions in 15 European countries. The most recent data obtained from the Italian research group, coordinated by Prof. Roberto Fontana, from the Psychology Department of Milan University, show that 68% of the near 1200 surveyed participants consider the practice of physical exercise and a healthy diet to be more important measures to attain good health than regularly going to the doctor or undertaking general medical care.

Prof. Fontana comments: "Nowadays health culture is preventive. Going to the doctor or treating illness through medical means is a resource that is used when there is something wrong in the organism. Currently, people prefer to adopt a healthy lifestyle rather than seeking services from medicine professionals. The data from the last Eurohealth demonstrate that, for most Italians and Europeans, specialized care provided by doctors and nurses are not so important for good health".