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STRUCTURAL RELATIONS AMONG SOCIAL REPRESENTATIONS: COGNEM ASSOCIATIONS WITHIN A REPRESENTATIONAL SYSTEM

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Contents

Abstract

Theory and research results about the structure of social representations have been built usually from the study of isolated representations. The studies aiming at identifying structural relations involving two or more representations are more recent. In the literature, different terms have been employed to refer to inter-related social representation sets, managed or not by a superior ideological stance; in those cases, we refer to representation families, systems or networks. In this context, there are coordination relations, in which associations can be identified at the same level of a social thinking architecture. Traditionally, the studies of representations in conjunction – presenting element intersections at the level of their cores or object labels – have been privileged. The present research aims at contributing to the knowledge about disjoint representations. When, at an inter-representation level, there are two or more representation structures linked by relations between cognems or between object-label words, we propose the name of representational system to the macrostructure that is formed, with relations formalized by the basic cognitive schemes model. The main research aim was to identify relations among elements of different social representations, submitting to test the existence of connection points among representations at the same level of the social thinking architecture. It is a model that conceives inter-representation relations at the level of cognems. All the studies concerned the investigation of a representational system including the social representation on aging. Most of the studies were conducted with university undergraduate samples from Padua, Italy – and Studies 1-A and 1-B also had a Brazilian sample of undergraduates and an Italian sample of elderly people. The first studies had the purpose of characterizing the representation system. After a preliminary qualitative study conducted with interviews with people from different age groups, which has allowed to identify the cognems of the social representation on aging, Studies 1-A and 1-B were comparative investigations that characterized the structural status of the elements of that representation and also structural differences linked to age groups and cultural context. Study 2 was a survey marked by paired evaluations of proximity between objects linked to the aging theme which allowed the identification of three social representations highly connected to aging, by means prototypical and similarity analyses: death, health and family. Study 3 had a mixed nature, with characteristics of both a quasi-experiment and a survey. It provided the characterization of the structures of the chosen social representations in the system and also assessed the intensity of relations between social objects in that system. Additionally, participants evaluated pairs of elements of the representation on aging and the other representations and indicated if they perceived a connection or not, enabling the identification of possible connection points. After the identification of those possible relationships,

the focus shifted to testing the plausibility of a model for connection points including a bridge relation between those elements. Study 4 consisted of context manipulations of emphasis or relativization of a peripheral element of the social representation on health that was connected to elements from the social representation on aging. It was observed that a context change relative to a peripheral element of a representation interferes on the activation of schemes relative to a second representation, regardless of their structural status; it is a first empirical evidence of the validity of a theoretical conception of coordination relations involving disjoint representations of a same system by means of connection points. Finally, Studies 5-A and 5-B aimed at verifying if denying or confirming the information of cognems from connection points would be associated with activation differences of semantic and evaluative relations (bridge relations) with elements connected to them, from the representation on aging. Differences were identified in the sense that compatibility with the content of the manipulated cognem was associated with higher valences of at least one of the hyperconnectors. As a conclusion, evidence was found of relations among social representations at the level of their elements, and the conception of a theoretical model of inter-representation connection points presented promising results. The model contributes to the understanding of mechanisms of association of social representations in disjunction and also opens possibilities for application especially concerning social representation dynamics, which might also take representation systems into account.

Riassunto (abstract in Italian)

Le teorie e i risultati di ricerca sulla struttura delle rappresentazioni sociali sono stati costruiti, in generale, a partire dallo studio di rappresentazioni isolate. Gli studi volti a identificare le relazioni strutturali che coinvolgono due o più rappresentazioni sono più recenti. In letteratura, termini diversi sono stati impiegati per riferirsi a insiemi interconnessi di rappresentazioni sociali, gestiti o non da un'istanza ideologica superiore; in questi casi, ci riferiamo a famiglie, sistemi o reti di rappresentazioni. In questo contesto, vi sono relazioni di coordinamento, in cui le associazioni possono essere identificate allo stesso livello dell'architettura del pensiero sociale. Tradizionalmente, sono stati privilegiati gli studi di rappresentazioni in congiunzione, che presentano intersezioni di elementi al livello dei loro nuclei o etichette di oggetto. La presente ricerca si propone di contribuire alla conoscenza di rappresentazioni disgiunte. Quando, a livello inter-rappresentazione, ci sono due o più strutture legate da relazioni tra cognemi o tra etichette di oggetti, proponiamo il nome di sistema rappresentazionale per la macrostruttura che ne risulta, con relazioni formalizzate dal modello di schemi cognitivi di base. L'obiettivo principale della ricerca è consistito nell'identificazione di relazioni tra elementi di rappresentazioni sociali diverse, sottoponendo a prova l'esistenza di punti di connessione tra rappresentazioni allo stesso livello dell'architettura del pensiero sociale. Si tratta di un modello che concepisce le relazioni inter-rappresentazione al livello dei cognemi. Tutti i cinque studi condotti hanno coinvolto un sistema di rappresentazioni, tenendo la rappresentazione sociale dell'invecchiamento come punto di riferimento. La maggior parte degli studi è stata svolta con campioni di convenienza di studenti universitari di Padova, Italia. Gli Studi 1-A e 1-B hanno avuto anche un campione brasiliano di studenti e un campione italiano di anziani. I primi studi avevano lo scopo di caratterizzare il sistema rappresentazionale. Dopo un'indagine preliminare qualitativa condotta con interviste a persone di diverse fasce di età, la quale ha permesso di identificare i cognemi della rappresentazione sociale sull'invecchiamento, gli Studi 1-A e 1-B sono stati realizzati tramite ricerche comparative che hanno caratterizzato lo statuto strutturale degli elementi di quella rappresentazione e anche delle differenze strutturali legate a gruppi di età e contesti culturali diversi. Lo Studio 2 è consistito in una ricerca caratterizzata da valutazioni appaiate di prossimità tra oggetti legati al tema dell'invecchiamento, la quale ha permesso l'identificazione di tre rappresentazioni sociali altamente connesse all'invecchiamento attraverso analisi prototipiche e di similitudine: morte, salute e famiglia. Lo Studio 3 ha avuto un carattere misto, con caratteristiche sia di quasi-esperimento sia di survey. Ha fornito la caratterizzazione delle strutture delle rappresentazioni sociali scelte dal sistema ed anche permesso di valutare l'intensità delle relazioni tra oggetti sociali in quel sistema.

Inoltre, i partecipanti hanno valutato le coppie di elementi della rappresentazione sull'invecchiamento e sugli altri tre oggetti e hanno indicato se percepivano una relazione o meno tra di loro, permettendo l'individuazione di possibili punti di connessione. Dopo l'individuazione delle relazioni possibili, l'attenzione è stata rivolta a verificare la plausibilità di un modello di punti di connessione tra elementi con una relazione ponte. Lo Studio 4 è consistito nella manipolazione di un elemento periferico della rappresentazione sociale della salute (tramite sua enfasi o relativizzazione), collegata ad elementi della rappresentazione sociale dell' invecchiamento. E' stato osservato che un cambiamento di contesto rispetto ad un elemento periferico di una rappresentazione interferisce sull'attivazione di schemi relativi ad una seconda rappresentazione del sistema, indipendentemente dal suo statuto strutturale. Si tratta di una prima evidenza empirica della validità di una concezione teorica che sottolinea le relazioni di coordinamento fra rappresentazioni disgiunte in uno stesso sistema per mezzo di punti di connessione. Infine, gli Studi 5-A e 5-B avevano lo scopo di verificare se il negare o confermare le informazioni di cognemi in punti di connessione fosse associato a differenze di attivazione di relazioni semantiche e valutative (relazioni ponte) con elementi ad essi connessi, della rappresentazione dell'invecchiamento. Sono state individuate delle differenze, nel senso che una compatibilità con il contenuto del cognema manipolato è stata associata con valenze più alte di almeno uno degli iperconnettori. In conclusione, si sono trovate evidenze empiriche riguardo relazioni tra rappresentazioni sociali a livello dei loro elementi, e ha trovato sostegno, con risultati promettenti, la concezione di un modello teorico di punti di connessione tra rappresentazioni. Il modello contribuisce alla comprensione dei meccanismi di associazione di rappresentazioni sociali in disgiunzione e apre anche la possibilità di applicazioni soprattutto per quanto riguarda le dinamiche delle rappresentazioni sociali, attraverso interventi mirati sui sistemi di rappresentazione presi in esame.

Introduction

When trying to make sense of reality and act upon it in a way that is productive, adaptive or pleasant, people rely on knowledge that they have of limited aspects of their everyday lives. In many situations, the knowledge that they possess about such portions of reality is provided by the social groups that people belong to, and is also shared with other group members. That knowledge takes the "shape" of structured organizations of symbols referring to a specific aspect of social reality. We can call one organization of that kind "social representation".

The concept of social representation and the phenomenon it refers to was first brought to light by the social psychologist Serge Moscovici in 1961. Since then, there have been various scientific approaches within social psychology directed towards investigating it. The present work is situated within a single one of them, the structural approach: it aims at studying phenomena from the characterization of the units that form them and their mutual relations, constituting structures, as well as identifying the laws that regulate the functioning of those structures.

Most research on social representations conducted by researchers aligned with a structural approach has been dedicated to the study of isolated social representations. Those studies have made possible to formulate basic models concerning their nature and transformations. However, some other investigations have already pointed out that social representations often form a wider formation, which is called representational system. But little is known about the mechanisms through which two or more social representations within a system interact.

This thesis aims at contributing for expanding the borders of knowledge on relations among social representations within a representational system. For that purpose, we must first characterize some social representations that are related to each other in a system, and then focus on a few connections of that system, in order to formulate models about the processes involved in those connections, submit them to empirical verification and arrive to conclusions concerning the mentioned processes. This is the course that we have taken throughout the development of the current work.

In Part I, the theoretical perspective that supports the research is presented in detail. In Chapter 1 a broad overview of the structural approach is given, making it clear that it aims at studying social thinking in general, and not only social representations. Chapter 2 is destined to a presentation of a conceptual model for representation structures which is employed throughout the whole work. Chapter 3 moves on to a literature review about relationships among social representations that defines the research problem of interest, identifying a need of producing

knowledge on relations among social representation elements (cognems), leading to the list of aims of the research that was conducted.

Part II, composed by Chapter 4, presents the social representation that we have chosen as a reference point for the work, duly justified: the social representation on aging. It also contains empirical research that was carried out in order to characterize that social representation as shared by different groups. Further, Part III addresses the representational system that includes the social representation on aging, with studies that identified and characterized other social representations that are linked to it in the beliefs of people (Chapter 5), and later characterized the relations maintained by those representations with higher refinement (Chapter 6).

After conducting research that was fundamentally exploratory in Parts II and III, Part IV departs from those baseline characterization studies to move on to the topic of relations among elements of different social representations. Chapter 7 presents a study that demonstrates that it is possible to retrieve such relations empirically, which gives strength to the need of formulating a theoretical model to take that phenomenon into account. In Chapter 8 a model to formalize a mechanism that links two elements from different social representations is formulated, and evidence from two studies indicate that it is useful to assess those relations. Finally, a general discussion summarizes the research that was carried out and comments on its contribution, limitations and future perspectives.

Part I: Theoretical perspective

Chapter 1: A review of the structural approach on social thinking

The structural approach on social thinking is a sociopsychological perspective originated in France in the 70s and 80s. It studies the effects of social variables in thinking processes through the identification and characterization of relationship structures involving knowledge formations. The name 'social thinking', other than indicating the main processes of interest, is also useful to differentiate it from the social cognition perspective, the more diffused social psychology stream. It has been almost 40 years since the approach gave its first steps, and research has grown considerably both in terms of number of studies and investigated topics (Rouquette, 2009).

Since the structural approach on social thinking is the theoretical perspective that directs the present research effort, an essential understanding of the field is needed to fully understand the work. Therefore, the present review is an effort aimed at presenting an up-to-date general overview of the key concepts and theoretical perspectives of the structural approach on social thinking, in order to systematize its developments and provide readers with an understanding of what it has achieved so far, and where it might be headed.

It is usually the case that the structural approach is considered as a school within a single theory of social psychology, i.e., social representations theory (Moscovici, 1961/1976; Wagner & Hayes, 2005; Jodelet, 2008). As such, the structural school is taken only as an effort to study and theorize about a few aspects of social representations, which is complementary to the classical dimensional approach (Jodelet, 1989a), just as other perspectives are concerned with particular processes such as social anchoring (Doise, Clemence & Lorenzi-Cioldi, 1992), and the relations of representations with dialogicality (Markova, 2003). However, this review is based on a different understanding: even if the major theoretical developments of the structural approach have been provided through the study of social representations, the structural understanding of social thinking processes is a theoretical framework that can be applied to a wider range of sociopsychological phenomena. For that matter, it is important to stress that if the structural approach has been fairly popular in the French tradition of study of social representations, the structural 'look' on social and human sciences has been developed outside that field, in works of authors such as Lévi-Strauss (1958) in anthropology, Piaget (1968) in genetic psychology and Codol (1969) in social psychology. Therefore, in this text we chose to present the structural approach as a stream directed not only towards the study of social representations, but to the sociopsychological study of knowledge and representations in general.

The main fields of study are presented and discussed; at first the basic concepts of structure and its relations with knowledge and representation processes are addressed, followed by the

presentation of social thinking and the architecture of the processes that are studied in the field. Finally, we move on to review research on social representations, phenomena that have inspired the majority of social thinking studies to date. At the final section we discuss briefly the state of structural research on social thinking in general.

A few things must be made clear: throughout the text we express our positions concerning debated topics, at times presenting views that are not shared by structural scholars. This is done mostly for reasons of disambiguation and evaluations of the field directions, and should not be taken as a consensus – or even as the opinion of a majority – of the community.

It must be stressed also that the current review is restricted to the conceptual and methodological framework of the 'French' structural approach itself, in order to present it in its own terms[1]. As such, it is not our intention to thoroughly assess the similarities and divergences of the approach in comparison to social representation schools and other perspectives in social psychology. Efforts in that direction have been provided by authors such as Lahlou (1996), who has proposed an evolutionist model of social representation propagation that integrates structural components with developments from 'standard' social representations theory; and Parales Quenza (2005), who has identified compatibilities between the structural and social cognition perspectives. In the present text, the reference to other theoretical bodies within social psychology is made only when it is essential to understand concepts and trends within the structural approach itself. Finally, the text is organized so as to point out to the theoretical contributions of the mentioned works. Individual studies are not described, and the reader is directed to the original sources in order to obtain methodological details.

Structure, cognition and representation

A structure is a system formed by interconnected units, comprising the laws that regulate its functioning. Treating a structure like a system means that a change in one component can bring about modifications in any other element. A structure possesses three basic characteristics: it is a whole, a meaningful unit; it can be transformed, it is not static; and it includes self-regulation mechanisms that guarantee its conservation as a system. Also, a structure can be formalized, in order to predict its functioning, and it is that capacity that carries the scientific interest associated with a structural approach (Lévi-Strauss, 1958; Piaget, 1968).

[1] It must be noted that some authors refer to a structural analysis of social representations outside the framework of the 'French' structural approach; see Wagner, Valencia & Elejabarrieta, 1996. Also the work of the school from Geneva (Doise, Clemence & Lorenzi-Cioldi, 1992), directed to the characterization of organizing principles of social representations, is considered to be structural.

However, a structure is not natural; it does not exist independently of the researcher that formulates it (Rouquette, 2008). This formulation activity involves the identification of relationships in a restricted portion of phenomenal reality and their formalization in a theoretical model (Rouquette, 1985). The structure is the theoretical model that is applied to reality, and not reality itself (Lévi-Strauss, 1958).

In social psychology, the structural approach has been employed to study cognition. Codol (1969) proposed a unifying terminology for the classification of cognitive processes and activities, providing key concepts such as cognem, cognitive universe, representation and cognitive structure. He posited that the smallest and most basic units of every theoretical system were to be called cognems. Such is the case of beliefs, opinions, ideas, attributes or items. Those cognems are integrated in interdependent sets, and the set comprising all cognems of an individual forms his/her cognitive universe. A representation is the interdependency between an individual's cognems and an object external to the individual itself. Consequently, cognitive structure is the set of organization rules of the cognems within the cognitive universe, and representation structure is a concept that refers to the organization rules of single representations.

Much of the social psychology of cognition is dedicated to the understanding of the representation construct, as well as to the processes related to it. A representation is a sociopsychological construct that performs a symbolic role, representing something – an object – to someone – a person or group. While doing so, the representation actually substitutes the object it represents, and therefore becomes the object itself, for the person or group that refers to it (Moscovici, 1961/1976). It is a quasi-concept, i.e, a set of poorly defined criteria to assign properties to something (Rouquette, 1985) that takes as object precisely what that quasi-concept commands (Flament & Rouquette, 2003). As such, a representation is a product that results from a process of representing, and always replaces the object that a social actor links to it. The object can only be accessed through a representation; for a given social actor, that representation 'is' the object (Abric, 1994a).

The subordination of the representation to a representing process, determined by a variety of sociopsychological variables and constraints, implies that a representation is an event, and not a substance (Rouquette, 1994a, 1995). To represent is to think, and the process of thinking is determined by variables of a physiological, physical and social nature, among others. Taking into account that social psychology aims at studying the processes of social interaction and explaining the influence of belonging to groups in psychological processes (Maisonneuve, 1993), it is essential to deal with the social variables and their relations with thinking.

Finally, it must be stressed that a structural approach aims at identifying structural processes and properties, independently of the contents of specific representations or symbols. If the explanation of a process is subordinate to differences in content linked to different representations, then that process bears little structural interest; the goal, rather, is to achieve formulations that enable a generalization to object classes, and are not limited to the understanding of single objects. According to this view, content is considered as a secondary quality that is not the focus of analysis (Rouquette & Rateau, 1998). This, of course, for the purposes of basic research; when the structural approach is useful within applied investigation, the characterization of content is of the utmost importance.

Social thinking

Definition and specificity

Rouquette (1973) coined the expression social thinking to identify a modality of thinking that takes place naturally in social situations. He was inspired by isolated sociopsychological discoveries that pointed out to common underlying processes. Such discoveries included the findings that people tend to execute the smaller possible amount of cognitive operations, following a cognitive economy principle (Abelson & Rosenberg, 1958); that thinking is motivated, i.e., people think in a way that provides them with maximum gain, while minimizing lack of satisfaction (Rosenberg & Abelson, 1960); that people judge propositions according to what is desirable, and not only logical (McGuire, 1968); that people organize their ideas one-dimensionally and based on extreme occurrences (De Soto, London & Handel, 1965); and that people tend to infer social meanings and justifications for loose information (Heider, 1967).

There is a two-fold meaning for the 'social' in social thinking. First, it is a form of thinking about the social sphere, i.e. the objects of thinking are aspects of social life linked to relationships among people and groups. This way, social thinking refers to the thinking processes about social objects (Rouquette, 1988). A social object is a focus of reflected practices among people, including the discourse about those practices (Rouquette, 1994b). Common thinking is social by nature, as it involves people connected through communication networks. A social object is an issue that people talk about, something that has at least a minimum degree of social salience in order to attract the interest of groups and be present in the content of communication exchanges (Flament & Rouquette, 2003).

The second meaning refers to the fact that social variables, such as belonging to different groups, interfere with thinking processes (Rouquette, 1988). Social thinking involves a set of

reasoning processes that subordinate cognition to sociability criteria and needs, constraining it (Flament & Rouquette, 2003). Social factors work as a metasystem that directs individual cognition according to social norms, values and needs (Doise, 1989; Guimelli, 1999). Additionally, social thinking cannot be dissociated from the framework of social communication conditions. Communication is the instance through which social thinking is transmitted, elaborated and transformed. Both social communication and social thinking reflect social structures, and therefore they are to be considered two aspects of a same phenomenon (Rouquette, 1996a, 1996b).

Concerning the cognitive products of social thinking, one might compare the logical mistakes made by common sense to biases and treat them merely as faulty information processing. Yet, a closer look reveals that social thinking generates products that are perfectly functional for their goals, obeying a principle of adequacy to social context needs (Rouquette, 1973). Social thinking aims at explaining isolated cases, protecting group identity and providing a practical understanding of social reality that works as a shortcut (Guimelli, 1999).

Finally, social thinking is not a chaotic variety of cognitive activity. It does not follow formal logic rules, but a social logic of its own, with rules that can be identified and studied scientifically; it is, therefore, one of the main objects of study of social psychology (Rouquette, 1973). Some of the basic operations of social thinking were identified by Moscovici (1961/1976): the mere proximity of two events is enough for social actors to establish a causal explanation; social actors formulate their conclusions first and afterwards look for plausible premises to justify them; and social actors' intentions and motivations determine the selection of causes and formulation of thinking products. Two other operations have later been identified by Rouquette (1994c): social actors rely on information that confirms their views about an issue; and they make use of examples of isolated cases as evidence that something is true.

Recently, Rouquette (2009b) has summarized the findings and theoretical propositions about social thinking in three properties. The first one is the multiqualification of relations. It means that two cognems can be connected by various types of relation operators simultaneously, even if they are seemingly contradictory. This implies that social thinking always allows a certain degree of uncertainty, nurturing multiple interpretations of events and changing them according to context variability. A second property is the restriction of reasoning space: social thinking operates taking into account the immediate context and the needs of the actors that are implied by a social situation, neglecting careful consideration of past history and future projections. Finally, social thinking products undergo tautological validation: they acquire the status of being 'true' to someone not due to objective evidence, but simply because a person or group holds them as being true. What

explains why a belief or representation is true for someone is the relationship that the actor of knowledge maintains with its object and the role that holding that belief has for the actor of group.

The architecture of social thinking

Social thinking processes result in different modalities of structured symbolic formations with different properties. Wolter and Gurrieri (2007) suggested that it is possible to classify those cognitive formations through the analysis of property differences. According to the authors, five dimensions are to be taken into account: structuring degree, connection to practices, temporal stability, object salience, and degree with which it is shared by people, providing a useful coordinate system to guide a taxonomical effort, and for that reason we will have those categories in mind.

So far, a few varieties of symbolic formations generated by social thinking processes have already been identified. Each one of them is inter-related within a higher order structure called social thinking architecture. In such a structure, different levels of analysis come into relation, as there is a hierarchy of symbolic formations: broader, more widely shared and more stable structures provide a framework for smaller-scale ones; lower-level formations find their coherence and possibility conditions within the enclosure of higher-level structures. That is why it is called a hierarchy of nested reasons (Rouquette, 1996a). Such architecture opposes formations from a wide collective level, with a high level of integration and small interpersonal variability, to a more particularized one, more specific and heterogeneous. (Flament & Rouquette, 2003).

The most individualized formations of social thinking are opinions. An opinion is an attribution regarding a specific occurrence of a social object (Rouquette, 1996a). As there are potentially infinite occurrences of objects, and as attributions can connect to an equally indefinite number of aspects, opinions can vary greatly from person to person. Likewise, they can be transformed easily through environmental changes. A second symbolic formation is the attitude, an affective disposition concerning an object class, rather than a specimen. Attitudes generate and manage sets of opinions, being more stable and resistant to change than the latter[2]. Also, they are shared within a group, whereas opinions can be multiple and admit interpersonal variability (Flament & Rouquette, 2003).

The justifications and reasons behind attitudes are based upon specific aspects of shared knowledge structures about more general social objects. That kind of symbolic formation is called social representation. In Codol's (1969) terms, a representation is a structured set of cognems

[2] Please note that the presented definition of attitude does not refer to mainstream attitude theories (e.g. Crano & Prislin, 2008).

directed to an object. When the object is social in nature and the representation structure is shared by a group, it is actually a social representation. Flament and Rouquette (2003), therefore, define a social representation as a set of cognitive elements linked by relations and directed to a social object, with both elements and relations finding their legitimacy within a group. A social representation is formed by two systems of cognems: a central core that is shared, indicating the main definitions and norms regarding the object, and a peripheral system that is more flexible and specific (Abric, 1994b).

Social representations belong to a more collective level of the architecture, and thus cannot be traced to a single individual. A social representation is most often stable, but it adapts to context changes and evolves historically, following natural dynamics. It is generated, negotiated and maintained within a group, through interpersonal and mass communication. It is through a social representation that belonging to a group acts on people's beliefs about social objects. When it comes to making sense of events and aspects of social life, a person's community is the source of explanations, descriptions and justifications. A social representation is a key formation in the architecture because it provides the guidelines for people to interpret situations of everyday life linked to salient themes, fitting them into familiar schemes. Finally, it is a practical knowledge: some cognems guide practices related to the social object of interest (Moscovici, 1961/1976; Jodelet, 1989b; Flament, 1987, 1994a; Rouquette, 1988, 1996a; Abric, 1994a; Rouquette & Guimelli, 1994; Moliner, 1998).

Social representations are the most widely studied formations of social thinking. Perhaps they are the most important ones, as the interaction between individual and group reality happens strongly at their level. The knowledge on their structural composition and functioning has already progressed reasonably, and will be the focus of a further section in this text.

The group knowledge of social representations is subordinate to very stable abstract formations called ideologies. In this sense, an ideology guides the structuring of sets of social representations. Whereas a social representation refers to an object, an ideology does not; it refers to social object classes. Additionally, while a representation is a practical type of knowledge that decodes an object to a group, an ideology is highly abstract and diffuse: it has no specific 'content'; rather, it is a set of constraints that directs thinking processes. Moreover, while a representation is shared by a group, an ideology regulates the thinking of a whole community or even society (Rouquette, 1996a, 1996b; Flament & Rouquette, 2003).

It derives from such relationships that the constraints contained in ideologies end up as defining sources of the characteristics of social thinking, i.e., the logic that commands social thinking processes (Guimelli, 1999). As a result, the social thinking operations that are unveiled by

research are certainly not 'natural', but a product of the values of a specific mass society; the masses legitimate and circulate core values through public communication systems (Rouquette, 1988, 1994b). In other words, if the organization of society was different, so would be social thinking.

Through the operationalization of ideologies as 'world views' such as catholic and communist ideologies or 'evil vs. good', some studies have already found empirical support for the dependence relationships of the social thinking hierarchy. Rateau (2000) demonstrated that a change of representational grid implies a change in attitudes, and that representations that are compatible with one's ideological beliefs are legitimated, while opposing representations are rejected. A recent study by Wolter, Gurrieri and Sorribas (2009) verified that different ideologies corresponded to different representation structures and contrasting attitudes.

Some other formations also belong to the ideological level of the architecture, but due to difficult research operationalization they remain as theoretical hypotheses. Such is the case of the *thêmata*, long duration source ideas structured as oppositions, located at the uppermost levels of the social thinking architecture, able to provide a framework for ideologies and representation families. Such formations would 'shape' lower-level structures, which would thus be seen as new instances of pre-existing archetypes (Moscovici & Vignaux, 1994; Rouquette, 1996c).

Additionally, there are studies on formations with still imprecise positions in the architecture. The nexus are widely shared affective formations associated with masses and responsible for collective behavior. A nexus relates directly to ideological contents, through highly polarized affect that influences reasoning. Just like ideologies, the nexus are potentially shared by a whole community, but they are not discussed by its members; rather, they are taken for granted. Due to an affective nature, nexus do not possess an elaborate cognitive structure. A specific characteristic of nexus is that they are associated or activated by very particular words or symbols, and also at a particular temporal context in which those symbols are associated with basic values; in other words, it is as if a very few portions of social reality become the direct targets of ideological norms (Rouquette, 1988, 1994b). Currently, there is no consensus on whether a nexus is a symbolic formation on its own or a concept that refers to social representation states that become affectively charged in a given temporal context (Wolter, 2009). Empirical nexus effects have been supported by research results on the homogenization of groups regarding a nexus object (Campos & Rouquette, 2000), on strong affective approval or rejection of nexus object labels compared to 'neutral' labels (Rouquette, 1994b; Delouvèee, 2006; Wolter, 2008); on reasoning and object recognition (Lo Monaco, Rateau & Guimelli, 2007; Wolter, 2008) and on declared intention to act regarding a nexus object (Wolter & Rouquette, 2006).

At the representational level, there are the collective representations (Durkheim, 1898). Such knowledge formations can be operationalized similarly to social representations; their distinction lies on the degree with which each representation type is shared. While a social representation is specific to a social group, a collective one is common to larger social segments, potentially a whole society (Rouquette, 1994b; Rouquette & Rateau, 1998; Flament & Rouquette, 2003). Some authors hold the position that while collective representations were predominant in the past, they have recently given space to social representations, supposedly more pertinent after the division of social roles and emergence of mass communication (Moscovici, 1961/1976). Nevertheless, it is a useful theoretical construction in contexts in which knowledge on a grand social object is shared to a large extent, such as widely shared representations as the belief in a just world and the opposition between individualism and collectivism (Deschamps & Moliner, 2008). The structural characterization of collective representations has not been particularly studied; however, due to conceptual similarities of social and collective representations it might be parsimonious to extend the understanding of many of the processes of the former to the latter.

A more recent field of research proposes the study of memory through a social thinking approach; as such, the interest of study lies on the influence of social variables on the recollection of the past (Sá, 2007; Rateau, 2009). Social memories are then investigated as representations of past events and characters (Moller, Sá & Bezerra, 2003; Pecora & Sá, 2008).

There are developments also on the more individual pole of the architecture. Singery-Bensaid (1984) observed that the perceptions of people regarding restricted objects were mainly composed by descriptions, evaluations and examples, but did not show signs of organization. Rather, those perceptions, called images by the author, were organized around the criteria provided by the social representations on more global and categorical social objects. Moliner (1996) developed the concept of social image theoretically, defining it as the result of a categorization of a specimen, with criteria defined by a related social representation; it is the set of characteristics and properties that people assign to an object, based on guidelines that are consensual within a group. A social image can be changed relatively easy with new information, and every object could be linked to a social image, as long as that object is also pertinent to a social object covered by a social representation. The concept of social image allows for an understanding of how social representation knowledge affects individual categorization of specific or subordinate occurrences of representation objects. Experimental results from the author indicate that it is possible to induce changes in social images through acting upon the image itself, through inducing different representational reading grids – e.g. presenting a school as a company, rather than an educational institution, would make people evaluate it differently - or through interfering with the

categorization process. It is easier to manage and transform social images than social representations, and that opens possibilities for applied research (e.g. Tafani, Haguel & Menager, 2007).

After an overview of the social thinking architecture, special attention will be given to one of its central and most thoroughly investigated formations: the social representation.

Social representations

Representation structure

When a completely new object appears in society or when a group faces a stake due to a pre-existing object, the basic conditions are fulfilled for the genesis of a social representation (Garnier, 1999). However, not all social configurations allow for the establishment of a social representation structure. Moscovici's (1961/1976) work proposes that three minimum conditions have to be satisfied in a given context: a social object must be ambiguously defined, people should feel the need to infer about it, and different aspects of that object should be salient for different groups. Moliner (1993a) has proposed complementary criteria: the object must be polymorph, referring to a general class; there must be an intergroup context, opposing at least two groups regarding the object; and the object must be linked to a stake for the group, threatening either their identity or social cohesion. Flament and Rouquette (2003) add the conditions that an object must have a concept function for the group, explaining a set of occurrences of subordinate phenomena; it must be a communication topic; and it must be associated with a level of social practices. Central core theory[3] is the most established theoretical development on social representation structure and functioning within the context of the structural approach. According to it, a representation is formed by two qualitatively different element systems: a central core and a peripheral system (Abric, 1976, 1984). In its classic formulations, the theory states that the central core includes a few key elements that generate the global meaning of the representation and organize the whole structure. The elements from the core have strong historical and ideological roots, and are consensual within a group. It is the central core that defines and distinguishes representations; one can say that two representations are different when at least one element from their cores is not the same. The peripheral system is the flexible part of the structure. It is not necessarily shared within the group; it integrates particular information to the structure, connecting it to environmental practices and modulations (Abric, 1994a, 1994b). The peripheral elements function as scripts for action adapting the guidelines from the central core to concrete situations and specific occurrences of the social

[3] For an introduction in Italian, see Galli (2006).

object class (Katerelos, 1993; Flament, 1994a). Finally, due to its flexibility, one of its functions is to defend central core contents against contradictions from the environment; if there is a situation that challenges the meaning of central elements, portions of the peripheral system are activated and try to justify the contradiction in order to endure it. Those rationalization mechanisms that function as bumpers for the central core are called 'strange schemes' (Flament, 1987, 1989; Guimelli & Rouquette, 1993).

The functions of social representations include providing knowledge about the object to the group, maintaining group identity, guiding action and practices regarding the object and justifying those practices (Abric, 1994a). According to Flament (1987), a representation with a single central core is to be considered an autonomous social representation, whereas representations without an organized core find their meanings in other related representations, and are classified as non-autonomous. Milland (2001) challenges that view; according to the author, there is no representation without a core, but sometimes an object can be interpreted by two different social representations, constituting different reading grids; that would be the case for representations still being structured, without meaningful associated practices.

Representations and practices

Social representations are usually found associated with practices employed by a group concerning the referring social object. The concept of social practices is prone to multiple interpretations; Flament and Rouquette (2003) distinguished among four conceptions of practices: the passing to an act, as opposed to not doing something; the frequency or intensity of execution of a given action; the expertise regarding an action; and the different ways of executing an action. The authors also clarify that a practice is not to be understood as physical behavior only; the discourse concerning a social object is also included. The broad definition provided by Flament (2001) is a good guideline: a practice is defined as a behavioral system that is socially legitimated.

A few pertinent questions impose themselves, then: what are the relationships between representations and practices like? Do representations determine practices?

Contrary to what intuitive thinking might suggest, the currently accepted theoretical position is that practices mediate representations and the environment[4], and not the other way around (Flament & Rouquette, 2003). This implies that both representations and practices are subordinate to environmental constraints; it is often difficult to separate both, as representation and practices find themselves in a correspondence relationship most of the time, except when environmental

[4] Environment is here understood as the set of constraints that are external to the direct representing connection between a group and a pertinent social object.

events impose changes in the latter, making them incompatible with the former (Flament, 1994b, 2001). Nevertheless, social representations predict the carrying out of social practices in at least two cases: when a social actor faces a situation involving a social object and has significant autonomy to act, free from strong constraints; and when an affectively charged situation activates issues that are shared within a collectivity. In both cases, it is likely that a pertinent representation will guide practices and behavior (Abric, 1994c).

Practices and environmental constraints perform essential roles to bring about transformations in representations. However, it is necessary to address two topics before presenting the theoretical models on social representation dynamics: cognitive scheme dimensions and structural centrality.

Basic cognitive schemes

A key theoretical advance for the understanding of relationships between cognems consisted in the basic cognitive schemes model, abbreviated as SCB[5]. That model classifies the possible logical relationships between two units within a structure; it makes it possible, for example, to frame relationships between a social object and a single representation element. The two units are coded as A and B and can be linked by up to 28 connectors, which can be grouped in five basic cognitive schemes according to the logical operation domain that they refer to: lexical (3 connectors), neighborhood (3), composition (3), praxis (12) and attribution (7) (Guimelli & Rouquette, 1992; Rouquette, 1994a).

Rateau (1995a) observed the empirical associations of connector activations with multiple social representation objects and proposed that the model be reduced to three basic meta-schemes, which he called social representation dimensions: description (the grouping of lexical, neighborhood and composition, summing up to 9 connectors), praxis (12) and evaluation (renaming the attribution scheme).

The contribution of the SCB model consists in the possibility of the understanding of the different logical roles that elements perform within the structure. The model makes it possible to characterize the activation of a representation or an element in a given context, going beyond the distinction between central and peripheral elements.

Based on Rateau's results, Flament (1994b) pointed out that social representation elements could be conceived as schemes with normative, descriptive and functional roles in the representation, admitting the possibility of mixed roles involving more than one of those

[5] From the original French expression, *schèmes cognitifs de base*.

dimensions as well. Likewise, Abric and Tafani (1995) later demonstrated that the elements from the central core have different functions: some of them provide norms regarding the social object, whereas others are related to practices, and a third group performs both functions.

Structure centrality

Perhaps the most important assumption of central core theory is the existence of a qualitative difference between the central and peripheral systems. Such distinction allows for the identification of what is in fact shared within a representation and defines its organization. The first experimental evidence of the validity of the central core was provided by Moliner (1989), who verified that in the absence of certain elements on a representation specimen, research participants would consensually deny that it referred to a given social representation, whereas they would preserve the representation reading grid in the absence of other elements. The latter were peripheral elements, conditional and negotiable, while the former were part of the central core, essential elements that defined the social representation object. That study was the first application of a double denial principle named 'questioning' or 'calling-into-question', usually abbreviated as MEC[6]. It asks participants if, in the absence of a characteristic, a specimen refers to a representation class. Questioning is currently the most widely accepted and employed technique to identify the central core, being employed with procedural variations (e.g. Moliner, 1993b, 2001).

According to Moliner (1994), central elements have two distinguishing properties. First, they possess symbolic value regarding the social object of interest; central elements are essential to keep its identity. Techniques grounded on the MEC principle rely on the diagnosis of that property to determine the centrality of elements. A second property is related to the associative power of central elements; these can be associated with more elements on the structure, being broader, whereas peripheral elements are associated with fewer ones. Two other properties derive from the mentioned two. High symbolic value means that the element is also salient in discourse, and high associative power implies that central elements are found connected to a higher number of elements. However, salience and connectivity, while typical of central core cognems, are not exclusive; peripheral elements can be activated by specific contexts and present those secondary properties as well (Flament, 1989, 1994c; Moliner, 1989, 1994).

Recently Moliner and Martos (2005) have obtained results that show that meanings from peripheral elements are more stable than the ones from the central core, and declared that such findings challenge the generating function of the core. According to them, central elements would

[6] From the original French expression, *mise en cause*.

have more semantic potential; they are thus able to take on different meanings in order to maximize the amount of relationships with other objects that they can maintain. Due to those results, the authors propose replacing central core theory with what they call matrix core theory: the matrix core would basically provide the labels and frameworks to make communication possible, aggregating subordinate element subsets due to their semantic potential, integrating particular experiences and making it possible for people to know what they are talking about. It can be seen, though, that such reformulation consists mostly of small changes in the labels of properties and structures within classical central core theory.

Alternatively, a minor adjustment could be done to the current central core theory, by giving a new interpretation to Abric's (1994a) generating function: rather than considering, as Moliner and Martos (2005) have done, that the core has a stable meaning and that peripheral meanings change more easily, one could understand that peripheral elements have more one-sided and concrete meanings whereas central elements, due to being more abstract, can suffer modulations in order to be applicable to many contexts. Such an interpretation is compatible with the associative power property, or what has been called semantic potential, and seems more parsimonious. In addition, perhaps it would be better not to look for a generating function related to isolated element meanings, but to consider that the central core imposes the meaning of the whole representation, and then even peripheral elements would have to be framed within a global object meaning. If interpreted that way, the results presented by Moliner and Martos do not really challenge central core theory, but are important at pointing out the need to specify precisely what the generating characteristic of the core refers to.

Rateau's (1995b, 1995c) research led to important advances in the models of central core structure. His research showed that there is a hierarchy of elements in the core: some of them, called prioritary, are truly unconditional and define the object, whereas a second set of elements, named adjunct, despite having high symbolic values, are conditional. Their goal is to evaluate or specify the object. In MEC tasks, prioritary elements display patterns of absolute rejection, while adjunct ones usually generate more diverse responses and conditional rejection. Only prioritary elements are essential to maintain the identity of the social object.

A further productive theoretical perspective concerning social representation structure has also been presented by Moliner (1995), who proposed a two-dimensional model: social representation elements would have a double nature, having two key structural coordinates. The first dimension involves representation structure itself, in which elements can be either central or peripheral; their status is determined by the assessment of their symbolic values through MEC tasks based on unconditionality. The second dimension opposes the roles of description and evaluation

performed by elements in the structure; in other words, it is a dimension opposing low and high affective loadings of elements. Both dimensions are posited as being theoretically independent, and their crossing enables a classification of four element status: definitions (descriptive central elements), norms (evaluative central elements), descriptions (descriptive peripheral elements) and prescriptions (normative peripheral elements).

Yet, the two-dimensional model has been challenged due to a few theoretical limitations and new empirical findings. Rizkallah (2003) indicated a theoretical shortcoming related to the affective loading dimension: every evaluation presupposes a description, thus making the description modality present in both poles of the dimension. Another shortcoming is related to results that show that the structural and descriptive-evaluative dimensions are not independent. In spite of Flament's (1994b) early position that stated that central elements were unconditional prescriptions regarding a social object, research had already indicated that centrality was not always linked to unconditionality; at times the symbolic values of central elements relied mostly on their normative function within the structure, rather than from them being unconditional (Moliner, 1992). Results from Gigling and Rateau (1999) simulating the anchoring process with an artificial object also showed that the attribution of value to an element might lead it to take a central role in the structure, thus pointing out to the special importance of the normative function to define centrality.

Nevertheless, the two-dimensional model was a major step in pushing structural theory forward. Its main contribution, with significant impact also more recently, was perhaps the integration of affect into central core theory, opening doors for studies relating social representations to attitudes (e.g. Moliner & Tafani, 1997; Roussiau & Bonardi, 2001; Tafani & Souchet, 2001). In terms of central core theory, the two-dimensional model was the first theoretical effort that truly took evaluative variables into account to characterize social representation structure.

Advancing on that topic, recent studies from Lheureux, Rateau and Guimelli (2008) confirmed that element centrality and normativity are not independent. Their results indicate that social representation elements possess a double component, associated with two roles in the structure: semantic and evaluative. The semantic component relates to the goal of defining the object class, whereas the normative component judges object specimens. Results from the authors show that such double dimensional nature is not only found on the core, but throughout the whole representation. The two dimensions are not independent, as normativity seems to play a key role: peripheral elements that score higher than others on normativity indexes are perceived as being less conditional, and additionally, some central elements have their symbolic values based on normativity rather than uncondtionality, as evidenced by conditional rejection rates.

The authors understand that their model makes it possible to explain how different sets of the structure are activated according to contextual demands: each representation consists in a categorization system, and when a social actor comes across a specimen, the first action that takes place is defining which object it is, through prioritary elements. Once the object class has been identified, adjunct elements come into play in order to evaluate the specific occurrence, and based on the resulting evaluation, conditional peripheral sets are activated to deal with it according to contextual needs. Thus, the model from Lheureux, Rateau and Guimelli (2008) makes it possible to explain the mechanisms involving peripheral understructures first identified by Katerelos (1993).

Still, there are other relevant theoretical developments linked to the understanding of structural centrality. Results from Guimelli (1995) suggest that central elements keep their basic cognitive schemes valences stable with context changes, whereas peripheral elements are prone to variation, even achieving higher scheme activation rates than central ones at times. In the same vein, though outside an SCB framework, Lo Monaco, Lheureux and Halimi-Falkowicz (2008) have developed an alternative technique to determine the centrality of elements through the measure of a related principle: independence to context changes. Contextual stability had already been identified as a property of the representational core in studies external to the 'French' structural approach (Wagner, Valencia & Elejabarrieta, 1996), and its inclusion in structural theoretical bodies is interesting and opens new research possibilities that expand central core theories and techniques based on unconditionality.

Finally, another SCB-based perspective of centrality is grounded on the balanced activation of attribution and practical schemes (Rouquette, & Rateau, 1998). According to that model, an element is central when the valences related to praxis and attribution schemes are both high. When both valences are low, it is the case of a 'regular' peripheral element, and when one partial valence is disproportionally high over the other, it is a peripheral element activated by a context effect. This perspective has the advantage of identifying over activated elements, but the inconvenience of being unable to deal with Rateau's (1995b) hierarchical core model.

Social representations dynamics

A transformation in a representation involves a central element becoming conditional and thus attaining peripheral status, or a peripheral element being 'promoted' to the central core. Changes in the salience or activation or peripheral elements are considered as minor changes but not structural transformations, as the peripheral system is flexible by definition. So far, the only way to induce representation changes passes through the carrying out of new practices, usually brought about by environmental events. Based on research results, Flament (1994b) formulated the

general model for social representation dynamics determined by practices, introducing two key variables. The first one is the compatibility of new practices with the representation. The second is social actors' perception of the reversibility of new practices.

When new practices are compatible with the central core, there is no challenge to the representational structure, and no transformation takes place. When, on the other hand, the practices are related to a peripheral aspect of the representation, the involved peripheral schemes increase in activation (Guimelli, 1994). If the carrying out of new practices is perceived as reversible, then that activation state is temporary, and no transformation takes place. If, in contrast, the practices are seen as permanent, then the peripheral schemes become central, and a progressive transformation happens (Guimelli, 1989; Guimelli & Jacobi, 1990; Flament, 1994b).

But when practices oppose both central and peripheral elements, then new sets of peripheral elements called 'strange schemes' are formed in order to try to accommodate the contradiction (Flament, 1989). If the situation is perceived as being reversible, then the contradiction is successfully neutralized and the representation remains unchanged; but if it is permanent, then strange schemes cannot hold the integrity of the structure and eventually there is a transformation in the central core to adapt to the new social context (Flament, 1994b).

The understanding of social representation dynamics usually comes from results obtained in field studies. According to Flament (2001), it is not likely to be possible to truly transform a representation in the laboratory, because even if the beliefs of a person change due to an experimental setting, true representation change implies opposing beliefs and practices shared by one's group, and that is socially undesirable by definition. Nevertheless, social influence paradigms have proven themselves very useful to understand the interaction and communication processes involving changes and resistance of the structural status of social representation elements for situated samples, thus accounting for pertinent instances of representation transformation (Mugny *et al.*, 2009). Studies aligned with that paradigm assessed the role of variables able to bring about representation transformation: majority and minority influence (Tafani *et al.*, 2003), the influence of epistemic authorities (Mugny, Moliner & Flament, 1997; Mugny, Quiamzade & Tafani, 2001; Mugny *et al.*, 2009), and asymmetry in intergroup status (Souchet *et al.*, 2006). Some studies have also obtained results pointing out to the other way around: representations about the influence context situation modulate influence processes (Mugny *et al.*, 2002; Quiamzade, Mugny & Buchs, 2003; Mugny *et al.*, 2009).

Presenting an important innovation, Tafani and Souchet (2001) made use of counter-representational essays, i.e. tasks forcing participants to provide opinions contradicting the shared representation. Later, Souchet and Tafani (2004) managed to reproduce Flament's (1994b)

complete dynamics model in a laboratory context, even including reversibility perception; changes last longer when contradictory practices are perceived as irreversible. As a conclusion, even if true social representation dynamics cannot take place in artificial contexts, there are promising possibilities in the laboratory to contribute to the understanding of a variety of processes in representational dynamics, to say the least.

If social representations do change, one inevitably comes to the question: how do they evolve? It is essential to stress that representations do have a history, adapting to the environment, even if it does take years or generations for them to change; the characterization of a representation structure is always the description of a representational state, a heir of preceding states (Rouquette & Guimelli, 1994). A social representation can be found in three chronological phases: emergence, or its birth as the social object appears in communication practices for the first time; stability, in which the representation becomes stable with a clear-cut core; and transformation, when environmental constraints bring about the already mentioned process of change (Moliner, 2001a). Stability and transformation alternate, until the representation is no longer pertinent at its social context; one can arguably refer to that as the 'death' of a representation.

Representations in action: interaction context effects

The actualization of representations in people's everyday lives is linked to the influence of context variables. There are two basic types of context: the global social context and the immediate situational one. The global context comprises the intergroup stakes and historical heritage that activate the central core and are responsible for its formation. The situational context is related to the multiple and particular interaction conditions in which a same social object comes into play, modulating the action of the peripheral system (Abric, 1994c; Abric & Guimelli, 1998).

Global context effects have already been addressed through the mechanisms of representation structuring processes and dynamics. But what about interaction context effects: how do individuals employ social representation knowledge in particular situations?

There are three topics that have guided research on context effects so far. The first one is dedicated to the understanding of the connection of people to social objects. Rouquette (1988, 1996a) has formulated three theoretically independent dimensions that could account for the personal implication regarding an object: personal identification, or the extent to which an object is related to a specific individual and not to everyone in general; social valuation, or the stake value linked to the object; and perceived possibility of taking action concerning the object. Flament and Rouquette (2003) view those implication dimensions as intermediate factors that could account for interpersonal and situational differences within a group in terms of behavior, opinions and attitudes

related to a social object; they refer to different degrees of involvement with the object. Implication is a condition for the transformation of representations and adhesion to related beliefs. Additionally, different implication levels usually mean differences in the use of social thinking processes: high and low implied people employ different modes of reasoning when facing contradictions to a representation core (Guimelli, 2002), and might be associated with the activation of different basic cognitive schemes (Baggio & Rouquette, 2006; Gruev-Vintila & Rouquette, 2007).

More recently, Guimelli and Abric (2007) suggested that knowledge on the social object could be a fourth implication dimension. Yet, such a dimension is questionable, as it overlaps with definitions of social practices: since the discourse concerning an object is considered one kind of practice (Flament & Rouquette, 2003), then different levels of knowledge could then be related to different levels of practices. As an example, research by Salesses (2005) evaluates the role of knowledge on an object in a way that is at least very close to that understanding of social practices.

Another topic that has deserved significant attention is the influence of normative pressures on the expression of social representation contents, especially when research participants complete questionnaires. Guimelli and Deschamps (2000) observed that socially undesirable responses come out more often when participants attribute those responses to their group (what is called a substitution task), but not directly to themselves; those normatively affected elements were called the mute zone of the representation. Rateau (2002) demonstrated that the elements that are likely to be affected by such a procedure have a mixed dimensional role in the representation, without a dominant basic cognitive scheme activation valence. Flament, Guimelli and Abric (2006) later demonstrated that characteristics from the experimenter and previous activation of stereotypes can exert normative influences on participants responses; those phenomena were called masking effects. Concerning the substitution technique, Chokier and Moliner (2006) indicated that a confounding social comparison effect takes place simultaneously to masking effects; participants try to maintain a high self-esteem through comparing favorably to their group members, thus assigning desirable responses to themselves and undesirable ones to the group. The study conducted by Wachelke and Lins (2008) also displays similar results, even if the authors do not refer to social comparison. Recent results from Chokier and Rateau (2009)'s results from a repeated measures study confirm that normative pressure is not the responsible factor for the effects observed with the substitution technique; rather, it is attributable to the reference adopted in a self-comparison with other ingroup members.

Social representations also perform an important role concerning social identity, as they are the final product of the action of identity processes involving the interaction of self, intergroup and collective representation with categorization, comparison and attribution processes (Deschamps &

Moliner, 2008). Therefore, a third topic on interaction context effects derives from a basic characteristic of social identity, and presents a problem: since individuals belong to multiple social groups (Tajfel, 1973), how does social representation knowledge come into play in a specific situation? Are there contextual cues that activate single representations, or is there an interaction between different social representations shared by a same individual (Breakwell, 1993)? Such problems have not been the explicit object of structural studies, but results from Wachelke and Camargo (2008) point out that when group membership is salient, the expression of elements related to group practices is favored.

Relations among social representations

A final topic of interest for this review concerns the interactions between two or more representations. Flament (1994a) tackled the problem by suggesting that a set of social representations could share the same values. Rouquette (1994) hypothesized that representations could be organized in indexes, as they are diacritical of their related objects, and therefore representations linked to interconnected objects could maintain relationships.

Those sets of representations or indexes have also been called representation networks or systems by Garnier (1999), whose data suggested that first representations establish their cores and at a further step they gather in networks; conversely, Milland (2001), who preferred to refer to representation families, presented results that indicated that some representations develop themselves from the start connected to other representations, which is an evidence that the inter-representation relationship precedes the structuring process: in the case of his research, the norms related to one representation guided the structuring of a second one. Such position is also supported by Pianelli, Abric and Saad's (2010) research that supports that a social representation linked to a new object is structured having preexisting ones as frames of reference.

Flament and Rouquette (2003) stated that so far there are two types of effects involving sets of representations. The first type is called field effect, consisting of peripheral modulations in social representation structure, originated from ideological formations (such as thêmata or ideologies). The second type involves coordination effects: the existence of direct relationships between representations at the same level of the architecture. Coordination effects could take place for representations with or without intersections in terms of central core elements. A preliminary taxonomy concerns three cases in which there is core intersection; it is then said that the representations are in a state of conjunction. A first case is dependency or embedding, in which one representation is subordinate to another; the object label related to the dominant is found in the core of the subordinate representation, whereas the object label of the latter corresponds to a peripheral

element of the former (Abric & Vergès, 1996; Fraissé, 2000). The second case is antinomy: two representations have cores that include cognems that directly deny each other (Guimelli & Rouquette, 2004; Milland, 2001). Finally, the third type is reciprocity, according to which two representations contain the object label of each other in their cores (Abric & Vergès, 1996).

Conclusions: current and future possibilities

From the proposition of a basic structural terminology by Codol (1969) to the integration of isolated cognitive operations into social thinking by Rouquette (1973) and the first formulations of central core theory by Abric (1976, 1984a, 1984b), the structural approach on social thinking has gained form and sketched a coherent theoretical body and methodological standards. It is based mostly on the study of social representations and its most successful and developed theory is central core theory, but there are promising possibilities for improvement and theoretical modeling for phenomena such as personal implication, relationships between representation sets and interaction context effects. Outside the immediate field of social representations, formations such as social images and nexus, or even the basic cognitive schemes model itself, still have much to be explored, while research on ideologies is still tentative.

An analysis of the literature related to the structural approach points out that a research phase responsible for big baseline discoveries and formulations, such as classical central core theory, relationships between representations and practices and basic cognitive schemes is over. The basics for a theoretical approach on structures of social thinking has already been established; as happens with any science, new data evidence theoretical contradictions and shortcomings calling for smaller scale model adjustments and refinement; a new phase marked mostly by more specialized research problems is taking place. Perhaps the main debate concerns the key topic of structural centrality of representations: there is a healthy competition between concurring theories that are incompatible at points; such is the case concerning Moliner's (1995) two-dimensional model and Lheureux et al.'s (2008) double component approach.

It is also important to stress that the understanding that social thinking processes owe their nature to a social component, which is of the utmost importance for the coherence of the whole approach, is to a large extent confined to the domain of essays and hypotheses. For example, the assumptions that the structural characteristics of masses as a sociological and historical phenomenon determine the characteristics of social thinking processes that are known today (Rouquette, 1994b), and the relationships between social communication and social thinking (Rouquette, 1996a, 1996b; Guimelli, 1999) are thoroughly discussed at a theoretical level, but have practically not been verified empirically, at least from experimental or quasi-experimental

perspectives; a remarkable exception, albeit located outside the mentioned structural framework, is a study by Huguet, Latané and Bourgeois (1998) linking the emergence of social representations to dynamic social impact: the authors have conducted research in which separate groups of people exchanged messages about a topic – human rights – for two and a half weeks, and it was later observed that their views on the topic became clustered and intercorrelated, supporting the position that ordinary communication gives birth to the phenomenon of social representation.

Yet, it seems much more difficult to test the wider relationships linking society characteristics with social thinking, as the key concepts and assumptions of the structural approach on social thinking are situated much closer to a sociological level of analysis than a sociopsychological one, and cannot then be satisfactorily 'translated' to laboratory contexts. Every science owes its directions, at a first instance, to its epistemological bases, and the structural approach on social thinking is clearly a scientific effort aimed at explaining thinking processes as being framed by values that are shared by and negotiated within groups, superimposing themselves to individual thinking. As long as its resulting theoretical models are plausible to predict and explain social behavior and cognition, the social thinking approach does constitute a valid field of knowledge in social psychology.

Finally, it is pertinent to point out that a more recent trend consists of social thinking studies that include variables related to mainstream social cognition processes (cf. Rateau & Moliner, 2009). As examples of efforts in that line, we can mention developments indicating the existence of conceptual and empirical links concerning intergroup representations and stereotypes, connecting the categorization and representing processes (Moliner & Vidal, 2003; Vidal & Brissaud-Le Poizat (2009), the two directional influences of causal attribution and representing processes (Moliner, 2009), the relationships of social representations with ingroup bias (Tafani & Haguel, 2009), and a contribution of the theories on representation structure to understand persuasion effects based on commitment (Eyssartier, Joule & Guimelli, 2007; Eyssartier, Guimelli & Joule, 2009).

Trying to understand the links between social cognition and social thinking processes is a very fruitful possibility, as both social thinking variables do interfere in cognitive processing of information as that processing activity itself has characteristics that influence the possibilities of social thinking to take place at a certain degree. Still, it is essential to evaluate carefully if some of the concepts from those different fields are not incompatible with each other, referring to different explanation levels (Doise, 1982); social thinking processes usually refers to intergroup and societal levels, whereas most of social cognition research privileges intra individual and interpersonal ones. Moreover, one also needs to take into account both the fact that occasionally there are overlapping constructs in both fields – for example, as Vidal and Brissaud-Le Poizat (2009) discuss, the

intersections between intergroup representations and stereotypes is considerable. And finally, eventual conflicts in theoretical and epistemological assumptions should also be assessed, even if some authors hold the position that both approaches are highly compatible (cf. Parales Quenza, 2005). Undoubtedly, the perspectives of social cognition and social thinking can contribute to each other to a large extent, but in some matters they might seem more like different alternatives to a same problem, such as two languages that refer to the same things through different strategies, rather than two vocabularies that should be merged.

Chapter 2: A conceptual model for representational structures

In order to present the empirical findings and theoretical developments related to structural inter-representation relationships, it is necessary to provide a baseline conceptual framework to formalize knowledge elements and their relationships, which constitute representation structures. After that, it is important to present in more detail the current theoretical positions about social representation structures in terms of the different types of elements that compose them and the different types of relationships that those elements maintain with a social object. This chapter is aimed at defining the main concepts to be used throughout the whole text as well as providing the reader with an essential level of knowledge about these topics.

Knowledge units and relations

As mentioned in Chapter 1, Codol (1969) proposed a unifying terminology to make the labels given to notions and concepts investigated by cognitive social psychology more compatible among themselves. According to that classification, the most basic unit is called cognem: this term then accounts for the simplest ideas, beliefs, traits, attributes or information units within a given theoretical framework.

In the case of a structural approach, it can be stated that a cognem is the most basic unit that makes it possible to establish a symbolic relationship. A symbolic relationship is understood in a broad way; quite simply, we are calling symbol something that designates something else, that is, something that has a referent (Newell & Simon, 1972), which will be treated as a minimal piece of knowledge.

Cognems and their relations may come into play to model knowledge. Still, it is important to recall that there are different types of knowledge. Declarative knowledge involves knowing "that", *i.e.* knowledge that is represented in the form of subject-and-predicate propositions. On the other hand, procedural knowledge is related to knowing "how" to do something, and is represented in the form of productions or actions. Another key difference is that declarative knowledge can be verbally communicated – due to its directly symbolic nature – whereas procedural knowledge cannot (Anderson, 1976).

A conceptual framework based on cognem structures has already been proposed by Rouquette (1994a), who limited its validity to declarative knowledge. We shall follow the same

path, leaving procedural knowledge aside from our considerations. As a consequence, we will only deal with knowledge structures in this text as systems of declarative knowledge.

The Basic Cognitive Schemes model

If we base ourselves on Rouquette's (1994c) work, it can be inferred that a minimal symbolic relation involves the reference that words and expressions maintain with their meanings. In this sense, they are verbal signs, and constitute lexical units. As an example, we can refer to the word "house" and the approximate meaning it conveys: a closed environment limited by walls and a roof, with doors and windows. Therefore, those lexical units are the most basic units on Rouquette's cognitive model, and are thus called cognems. Two cognems (lexical units) connected by an operator that specifies a relation between them constitute a triplet, a minimal knowledge event that can be formalized as follows:

A c B;

Where *A* and *B* are different lexical units and *c* is a relation operator.

In that triplet, the *B* term is referred to as an aspect of the *A* term. The interpretation of how that aspect is linked to *A* is given by the nature of the operator in the triplet (*c*).

Rouquette's (1994a) perspective states that the number of operators (also called connectors) belonging to a knowledge model is finite; this implies that cognems may be related to each other in a limited number of ways.

As an illustration, let a knowledge model be composed of two connectors: YES, to be employed when the two terms in a triplet are related in any possible way (they are synonymous, they are the opposite of each other, one is caused by the other, one acts over the other, and so on); and NO, when the two terms refer to things that are unrelated. If for a knowledge event, the *A* term is "house" and *B* is "people", there would be two possibilities to relate those two cognems to each other: *house* YES *people* (house and people are related concepts) and *house* NO *people* (house and people are unrelated). In both configurations, *people* is an aspect of *house.* When either (or both, as they are considered theoretically independent) of those situations are true in the context of a knowledge system, then the corresponding triplet is said to be activated.

In addition, it is possible to classify connectors in higher-order classes, according to similarities in the relations expressed by them, defined by a pertinent criterion. In that case, the class is called a scheme, and is represented by a hyperconnector. The knowledge model itself is identified by [*z*/*k*], where *z* is its number of schemes (at least 1), and *k* is the total number of cognems contained in the model (at least 2). In the case of our previous example, we have a [1/2] model: one scheme related to the existence of relationships between cognems (represented by a hyperconnector that we might call REL), that contains two connectors, YES (existence of a relation) and NO (absence of a relation).

Guimelli and Rouquette (1992) identified 28 possible relationships between cognems. According to similarities in the logical nature of those relationships, they were grouped into five basic cognitive schemes: lexicon (lexicographic connectors), neighborhood (connectors related to inclusion or co-inclusion relationships), composition (connectors linking parts to the whole), praxis (connectors related to the description of actions) and attribution (connectors that link qualities and attributes to the first cognem).

Rateau (1995a) assessed the empirical associations among cognems related to different social objects, i.e. topics of everyday life that are relevant for social groups, and regrouped those schemes into three meta-schemes. The first meta-scheme is called description, and it involves a descriptive register of cognition, comprising the lexicon, neighborhood and composition schemes. The second and third meta-schemes coincide respectively with the praxis and attribution schemes, but attribution was renamed to evaluation. Praxis contains the functional operations between cognems while evaluation refers to judgments and evaluations about a cognem. The resulting set is a [28/5] basic cognitive schemes model, presented in Figure 1, which presents each connector (*c*), the scheme and meta-scheme where it is included, and the verbal expression that conveys the relationship between the two cognems (lexical terms *A* and *B*). A connector called NUL is added to the model to account for the absence of relationship between two cognems.

Meta-scheme	SCB	*C*	Relation expression
Description	Lexicon	SYN	*A* means the same thing as, has the same meaning of *B*
		DEF	*A* can be defined as *B*
		ANT	*A* is the opposite of *B*
	Neighborhood	TEG	*A* is a part of, is included in, is an example of *B*
		TES	*B* is an example, a particular case of, is included in *A*
		COL	*A* belongs to the same general class (category) than *B*
	Composition	COM	*A* is a component of *B*
		DEC	*B* is a component of *A*
		ART	*A* and *B* are both components of the same thing (same object)
Praxis	Praxis	OPE	*A* does *B*
		TRA	*A* acts over *B*
		UTI	*A* uses *B*
		ACT	*B* does *A*
		OBJ	*A* is an action that is applied over *B*
		UST	*B* is used to do *A*
		FAC	*B* is someone (a person, an institution…) who acts over *A*
		MOD	*B* is an action that can be done over (about, in the case of) *A*
		AOB	*B* is a tool that is used over (about, in the case of) *A*
		TIL	*A* is used by *B*
		OUT	*A* is used to do *B*
		AOU	*A* is a tool that can be used for *B*
Evaluation	Attribution	CAR	*A* is always characterized by *B*
		FRE	*A* is often characterized by *B*
		SPE	*A* is sometimes characterized by *B*
		NOR	*A* must have the quality of *B*
		EVA	*B* evaluates *A*
		EFF	*A* causes *B*; *B* is a effect of *A*
		COS	*A* is caused by *B*; *A* depends on *B*

Figure 1. The basic cognitive schemes model (the text of relation expressions has been translated and adapted from Rouquette & Rateau, 1998)

The SCB model has been mostly employed in social representations research, the field dedicated to the study of inter-related sets of cognems that are shared by a group and refer to

aspects of a social object (Flament & Rouquette, 2003). The cognems that form a social representation are also called social representation elements, and in social representation literature both names are usually interchangeable. Some SCB-based measures of cognem activation have set the main standards for the characterization of the activation of relations between social representation objects and social representation elements. In other words, according to Rouquette's (1994c) terminology, the SCB model assesses the activation of relations between cognems.

Empirical SCB techniques are usually based on the understanding that the *A* term on a triplet is a social representation object label – the sign by which a social object is broadly known in a given population – and *B* is a social representation element. The standard empirical task asks a sample of participants to provide three responses in the form of words or statements upon reading a stimulus word, which corresponds to the social object label – the *A* term. Each response is then taken as a *B* term on the triplet. After that, they must write a sentence for each of those responses, explaining why they chose them; that step stimulates them to clarify to themselves the possible relationships and reasons that made them mention each of the responses. Finally, three lists must be completed: each one of them presents the relation expressions from Figure 1, and includes the *A* term and each of the responses (i.e., "your response 1", "2", and "3"). For each relation, respondents must give their opinions, indicating if it is true or valid or if it is not. So, each respondent provides three data sets (each one being a full triplet list with 28 connectors) (Guimelli & Rouquette, 1992).

Other possibilities include tasks in which both the *A* and *B* terms are already given in the expression list. This is called a forced or constituted association procedure, and it makes it possible to assess relationships between a social representation object label (*A*) and an element (*B*) or even relationships between two elements or two social representation object labels, alternating their positions on the triplet (Fraissé, 2000; Milland, 2001). Another empirical variety of the technique asks participants to complete relation expressions already containing the social object label as the *A* term, providing written responses to take the place of *B*. A different response is given for each connector. Such qualitative task is called sentence completion procedure (Stewart, 2004) and is thus a directed verbal association task (Flament & Rouquette, 2003).

With the data from the standard and forced association procedures, it is possible to calculate the proportion of activated connectors within a sample. That proportion is a measure of the overall cognem activation rate of the social representation. In other words, it is the degree at which the stimulus term (*A*) is able to enter relationships with other verbal signs (*B* term or terms), within a sample (Guimelli & Rouquette, 1992). That activation proportion is called total valence. It is an

indicator of the development of the symbolic network related to a social representation. Partial valences can also be obtained at the level of meta-schemes, basic schemes and single connectors (Rouquette & Rateau, 1998). Theoretically, the activation of each connector is considered independent of the activation of others; if two cognems are compatible for a respondent, then it is unimportant that those connectors are incompatible between themselves from the point of view of formal logic. The respondent is the expert to judge his or her own production (Guimelli & Rouquette, 1992). However, it must be noted that empirical procedures that group data from connectors with clearly opposing relationships – and then likely to be mutually excluding – into a single dimension related to a scheme or meta-scheme have been the target of criticism (Clemence, 1995).

Some studies pointed out to the importance of taking basic cognitive schemes into account for the study of social representations. Guimelli (1994) conducted a study with a sample of nurses, about the representation on the nurse's specific role. His results indicated that the more experienced nurses had higher praxis valences than less experienced ones. In the same vein, Abric and Tafani (1995) obtained results about the social representation on the firm that showed that people without practices regarding that object privileged normative relation activations, whereas people who already had a certain practical experience concerning firms activated proportionally more functional aspects. More recently, Gruev-Vintila and Rouquette (1997) demonstrated that people who were more closely personally involved with earthquakes had higher valences associated with that topic, especially if they had already experienced life events concerning that phenomenon.

Although SCB techniques have been used only in the context of relationships involving social representations object labels and elements, their application can be easily generalized to the characterization of the activations of cognems of any nature; e.g. within personal representations. In other words, basic cognitive schemes models might be pertinent to assess the activation of structured and unstructured cognitive units of declarative knowledge involving verbal signs.

Representations: personal and social

After having dealt with the baseline conceptions on what cognems and knowledge relations are, we can proceed with the description of our conceptual model for representational structures. First of all, for the sake of simplicity and clarity of our model, a change in terminology will be adopted in the present text from now on. Differently from Rouquette (1994a), who considers that the relation of a verbal sign to its meaning is the most basic knowledge relationship, we will call

cognems the relationships that are immediately above it, that is, the relationships involving two verbal signs and a connector.

In other words, what Rouquette called a “relationship between cognems” is exactly what we will call cognem. It is mostly a change in names; all the characteristics described in the literature about the SCB model still apply if naming adjustments are made. Why do we propose this change? Simply because it allows us to establish a relationship of equivalence between a triplet (two lexical units set into a relationship by means of a connector) and a minimal unit of knowledge. Our understanding of cognems is not far from Lahlou's (1996), in the sense that, for this author, cognems are signs linking an object to what they actually represent for someone.

Actually, the basic idea behind this is not at all different from Rouquette's; a verbal sign and the relationship with its meaning can easily be taken as a “verbal sign DEF meaning” triplet, if we are to use the SCB model. But if we adopted it, then most of the considerations regarding our model would deal with some sort of second-order relationships (relationships involving cognems that are themselves relationships between a verbal sign and its meaning), which would unnecessarily complicate things. That justifies our choice of taking verbal signs for granted and going up one level on the symbolic scale. From this point on, when we refer to cognems we will refer to a triplet involving two verbal signs and a connector, unless explicitly noted.

The SCB model is a formalization of declarative knowledge. Rouquette (1994c) refers simply to the context where cognitive operations take place as being a knowing system. As such, the SCB model is independent of specific characteristics of actors of knowledge. However, a model about representational structures is not. A representation is a concept that links sets of symbols to an actor: it represents something – an object – to someone, whether person, group or other specific knowledge system. Therefore, we must specify what kind of actors of knowledge the conceptual model refers to. We consider that the knowledge systems of interest are humans, in the form of individuals - even if we do not take physiological processes into account - and groups..

The whole set of cognems that are held by a person forms what Codol (1969) called cognitive universe. When cognems have an *A* term in common, it can be said that they are ideas, beliefs, or opinions (depending on their nature) that refer to the same thing, that is, the same object. A person’s structured set of cognems involving the same object is a representation in Codol's terms, which we will refer to as a personal representation. An object could be virtually anything that comes across the life of a person; a topic, an event, a physical object, other people, and so on.

The interdependency and organization rules of a set of cognems related to a same object receives the name of representation structure. Each cognem within a representation is called

representation element. The characterization of representational structures is the main goal of a structural study of knowledge, and it involves assessing if some elements are more important than others, the specific contexts in which some elements are activated and others are not, the specific aspects of the object that are covered by each element, how each element is related to each other, how thinking processes affect the configuration of the structure, and so on.

Within that perspective, thinking is understood as the activation of cognems, or the condition in which a cognem, a unit of knowledge consisting of two verbal signs maintaining a relationship, is true. Saying that a cognem is true does not mean that it is true as in "correct", in formal logic terms or in what concerns the comparison of a cognem with empirical reality. When we say that a cognem is true, we mean that it is valid within a knowledge system. If we refer to a person as that system, then it means that the person believes in the content of the expressed cognem, or alternatively that the person refers to knowledge from that cognem in a given situation, or even that a person brings that cognem into the space of conscience. By saying that a cognem is true, we mean that a unit of knowledge, a relationship between two signs, is valid for that person in a specific situation. In this sense, thinking is the activation of knowledge. This broad understanding encompasses both the production of cognems as in learning through experience – so that new relationships between verbal signs are created, whether from data from the senses or from active construction of knowledge -, and the activation of cognems that had already been produced in the past, by means of memory retrieval.

In the case of social representations, there is a change in the nature of the knowledge system; it is no longer a person, but a collective entity, the group. There is a vast number of definitions for groups in social psychology, but for our purposes we will adopt Wagner's (1994) understanding of what they are, following his distinction between nominal and reflexive groups. A reflexive group is a set of people that conceive themselves as being a meaningful group, and possess the criteria to differentiate group members from non-members. It is, then, an actual group, differently from aggregates of people that are placed together according to some external criterion of which group 'members' are unaware. The latter form what Wagner calls a nominal group, which is not a group on its own. The model makes the restriction that a group must be a reflexive group in order to be considered as a knowledge system; nominal groups are not truly groups from a sociopsychological point of view, and therefore belonging to one such group is not likely to affect the representations of its 'members'.

If in fact a conceptual framework with representation elements and cognems classified within a basic cognitive schemes model does seem to be a convenient way of characterizing group

knowledge, on the other hand one must not fall in the trap of transferring the understanding of knowledge processes that take place within the individual to explain a collective reality. Durkheim (1894) had already pointed that problem out when he stated that social facts had a different nature from that of psychological ones, and were regulated by different processes.

Even if we consider that a group is a knowledge system for our model's sake, there is a challenge: there are no ways of directly assessing what groups 'think'. Empirically, it is people who believe in things, who hold opinions, who interpret things from the environment, or who take decisions. If data is obtained about a person's cognems or representations, then they are validated from the start: they are true and legitimate for that individual. But how to do a similar thing with a group?

Our position is that the group 'thinks' in the sense that belonging to a group gives someone the access to some representations and influences that person to adopt those representations, since one's own group is a legitimate source of knowledge for the group member. Also, beliefs and ideas that might emerge from the ideas of isolated people or subgroups and that are discussed and re-elaborated by their community and potentially become supported by the whole group, thus exerting a more general influence on group members. Dynamics of this kind trespass the borders of personal psychological processes and acquire the status of a collective phenomena supported by the group as a network. All in all, Flament and Rouquette's (2003) definition of social representation seems compatible with those considerations: it is a set of cognitive elements linked by relations, and both the relations and the elements are legitimated within a group.

Still, the operational 'leap' from a personal to a group level in research is not an easy and single one. There must be an agreement in terms of a criterion or a set of criteria that justify the passage. The most recurrent trend is the consensus criterion: in practical terms, researchers collect sets of observations related to representational phenomena and assume that a consensus or majority pattern in the data provides support to associate results to a group as an information processing system. However, if we examine more closely the notion of consensus, different patterns can be found; a manifest consensus, when people agree about something and also believe that there is general agreement about it; a latent consensus, when people agree but do not believe that other group members share their opinions; and a fake consensus, when people think that other group members share their opinions, but the actual level of disagreement is high (Moliner, 2001b). Moreover, Wagner (1995) presents a position, supported by empirical results, suggesting that a social representation is a representation that is consciously associated by a person as being attributable to a group, a property that he called holomorphy. That clearly goes in a different

direction, which indicates that the assessment of consensus is not the only possibility to decide whether a representation can be associated with a group or not. It is important, though, to make it clear that discussing the appropriateness and the precision of the consensus criterion goes beyond the scope of this text; what must be emphasized is that that there must be some kind of criterion – grounded on sociopsychological theory – that allows the researcher to infer group representations from individual data.

Before moving on to deal with structural cognem roles, a brief comment is necessary. When dealing with representations, referring to objects, cognems and elements might create some confusion, as often different things have the same names, i.e. verbal signs, as labels. For example, "work" is an object label, whereas the same word might also refer to an element in the representation structure about the "firm". Also, the label to an element or cognem should, in our understanding, always contain the connection with the object it is linked to; otherwise, we would just be referring to an isolated verbal sign that could fit in a number of structures.

To avoid misunderstandings, from now on, when a given label is written as "[label]", inside square brackets, it is to be understood that we are referring to a representation or a representation object. When it is written as in "<label>", between angle brackets, then we will be referring to a cognem, or in other words, a representation element. If only a verbal sign is written in the cognem expression, then the context of the sentence should clearly indicate the representation it refers to. Otherwise, we will include either the object label linked to the element *B* term label (as in <object-*B* term>) or, to differentiate cognems at the level of connectors and provide higher refinement to the description of a structure, the whole triplet (as in <object-CONNECTOR-*B* term>). In the case of our "work" example, [work] is a representation, <firm-work> is the cognem "work" from the representation on the "firm", and <firm-CAR-work> is a cognem stating that a "firm" is always characterized by "work", as CAR is a connector from a basic cognitive schemes model.

Research about the roles of cognems within social representation structures

Research has already shown that the cognems perform different roles in the social representation structure. Abric (1976, 1984b) studied the representations of people about a task involving research participants and a second actor or opponent who could not be seen by them. Participants were informed that their opponent was either a computer program, or a human, but the opponent's behavior did not change across experimental conditions. However, the interpretation of the situation and the behavior of participants was determined by their assessment of characteristics

of their opponents. The author them formulated the hypothesis that the entire representation was organized around a core formed by the element of <reactivity>. In the case of a non-reactive computer opponent, participants viewed the situation as a problem solving task, whereas when they had been told that their opponents were humans, who could evidently react to their own behavior, the task was seen as a competitive game. Abric then formulated a hypothesis that stated that each social representation was organized around a central core that gave meaning to the whole structure and that comprised its most important elements. A survey study involving artisans` social representations about their own occupation also indicated that a few representation elements organized the whole structure, giving further support to the central core hypothesis (Abric, 1984a). As mentioned in Chapter 1, the later systematization of central core theory distinguished between two structural systems, a central core and a peripheral system. The theory states that central elements are consensually shared within a group, usually possess strong historical origins, and that different representational cores are the main evidence that points out that two social representations are different (Abric, 1994a, 1994b). The remaining elements form the peripheral system. Those elements are conditional and individualized, not necessarily shared by the group. They are usually associated with central elements, adapting them to specific contexts or justifying them (Flament, 1987, 1989).

Central and peripheral elements do not necessarily differ due to their salience for a population at a given moment. So there must be a qualitative difference between the two systems (Flament, 1989). In this sense, two structural properties are exclusive of central elements; they have a strong symbolic value with the social object label, constituting an unconditional connection to provide its meaning and interpretation for the group. Additionally, they also possess strong associative power, which means that they can connect with various other representation elements, guiding the meaning of peripheral elements (Moliner, 1994).

The main evidence of a qualitative difference involving the symbolic value of central and peripheral elements has been provided by Moliner (1989). The author conducted a study about the social representation of undergraduates on the [ideal group] and demonstrated that participants would only identify a group of students as being an ideal group when a few characteristics were true within that group: there was friendship among members, and there was no leader. In those cases, participants would change their reading grid of the situation and not treat the fictitious group as an ideal group. In contrast, with equality of opinions, another representation element that was highly cited by students - i.e., it was also highly salient within the population -, the rejection of the ideal group reading grid did not take place; results accounted for a qualitative difference between two

types of elements. <ideal group–friendship> and <ideal group–absence of hierarchy> were central, whereas <ideal group–equality of opinions> was a peripheral element. This would imply that central core elements are unconditional, whereas peripheral elements are not.

Results obtained by Moliner (1992) about the same representation indicated that the elements previously identified as being peripheral were perceived by undergraduates as being conditional, but central elements were not understood as unconditional; rather, they were perceived as normative schemes. Rateau (1995b, 1995c) gave sequence to the study of the social representation on the [ideal group], and his results point to a distinction within the central core of the representation. That differentiation was made possible after he observed that some elements usually lead people proceed to an absolute rejection of the reading grid when they are questioned (e.g.: "if element X is not present, then this thing cannot be object Y at all"), whereas other elements are preferably the target of conditional rejection (e.g. "if element X is not present, then it is unlikely that this thing is object Y"). The theoretical solution advanced by the author was that some elements, called prioritary, are unconditional and define the representation object; they tell people "what the representation is about", while others – the adjunct elements – are conditional and describe desirable occurrences of an object, qualifying them.

A further study by Gigling and Rateau (1999) shed additional light on the understanding of that topic. The authors created a fictitious representation object, the ["Gopas' tests"], a set of passage rites supposedly done by an exotic people, composed of a few separate tasks. The full set was taken as a representation object while each task was considered as an element. The task that was assigned affective value was considered by participants to define the object. It is important to indicate that affect and norms are close to each other. Since norms indicate how one thing should or should not be, they are usually associated with "good" affect or "bad" varieties of it. So that result indicated further links between normativity and centrality, adding to Moliner's (1992).

More recently, Lheureux *et al.* (2008) conducted studies about the representations on the [ideal group] and [higher studies], based on the distinction between absolute and condition reading grid rejection. The authors verified that indeed the two types of elements in the core are supported by different structural bases. Prioritary elements owe their symbolic value to being unconditional; thus, they define the essential conceptual characteristics of an object and guide a categorization process. Adjunct elements are central because they have a strong normative nature, and they complete the categorization process by distinguishing how good or bad a specimen of an object must be. The current understanding on representation structure is that each element has two components; a semantic one, related to its defining power, and an evaluative one, linked to its

normative potential. Their results also point out to the validity of that double component conception at the peripheral level.

There are numerous additional studies that, altogether, point out to other differences concerning the roles of central and peripheral elements. Abric (1989) observed that central elements are more recalled than peripheral ones in spontaneous memory tasks about the social representation on artisanship. Research about the social representation of undergraduates on [higher studies] indicated that central elements resist more to attempts to transform the representation (Moliner & Tafani, 1997; Tafani & Souchet, 2001), and also that representation transformation can only take place if some event questions a central element; challenging a peripheral element is not enough (Mugny, Moliner & Flament, 1997). A more recent study by Moliner and Martos (2005) demonstrated that central elements have more semantic potential than peripheral ones, as their meanings are applicable to various contexts, entering into more knowledge relationships.

There was also research conducted about the relations involving structural status and basic cognitive scheme valences. Studying the representation on the ideal group, Guimelli and Rouquette (1992) demonstrated that central elements generally get into more possible basic cognitive schemes relations with the representation object label – i.e, they usually have higher total valences – than elements from peripheral system. However, Guimelli (1995) verified in results about the social representation of nurses about their [occupational role] that the total valence associated with a representation element might be misleading, as he observed that some peripheral elements, when contextually over activated, had higher valences than the central core. Rouquette and Rateau (1998) proposed to assess centrality through a balanced ration between observed total valence and the partial praxis and attribution valences, which they called lambda. Their results in studies with the representations on the [deviant person] and the [ideal group] were able to differentiate central and over activated peripheral elements, refining the understanding of the links between valence and structural status.

Currently, there are a few techniques that are employed to characterize the structural status of representation elements, based on the mentioned differences in properties of central and peripheral elements. Prototypical analysis (Vergès, 1992) is conducted with word association data. It departs from the principle that central elements are more accessible to conscience, and thus tend to be highly mentioned in word associations and also evoked first in discourse. The analysis is then a way to organize word association data according to the frequencies of responses and their average evocation order. Words that have high frequencies and lower-than-average evocation ranks are likely to be central elements. Still, as those properties deal with salience and could be influenced by

context, therefore not being exclusive to central elements, this technique is usually considered a way to identify possible candidate elements for centrality, and not a precise measure of structural status (Moliner, 1994).

There are two well-established procedures to assess the structural status of elements. The most popular of them is the questioning technique (Moliner, 1989), the presentation of an occurrence of an object in which the presence of one specific element is denied, one at a time. Research participants are asked to decide if, in the absence of that element, it can be said that the occurrence is a specimen of an object. As an example, in the case of an element <work> and a representation on the [firm], would respondents think that an organization in which people do not work is a firm? If most respondents answer to that positively, whether in absolute or conditional terms, then <work> is not an element that has a strong symbolic value associated with the [firm]. If on the other hand the data points to a majority indicating that an organization in which there is no work cannot be a firm, then <firm-work> has strong symbolic value and is a central element on that structure. That underlying principle is common to all questioning procedures, but there is a number of variations in task instructions and response modalities, including ambiguous scenarios (Moliner, 1993b), the evaluation of specific cases (Moliner, 1989) and more straightforward questionnaires (Moliner, 2001a).

A second technique to characterize structural status is the one proposed by Rouquette and Rateau (1998) based on the valences from the basic cognitive schemes model. It departs from the understanding that a central element has both a fairly high total valence and balanced attribution and praxis partial valences. It is considered that the partial descriptive valence does not, in itself, account for centrality. A ratio between observed total valence and a projection of total valence based on a balanced relationship between the attribution and praxis valences is calculated; it is a vectorial relationship called *lambda.* Like other techniques, it makes it possible to differentiate among central and 'regular' peripheral elements (which have low total and partial valences, or total valences due to the influence of descriptive connectors), but it also distinguishes contextually salient peripheral elements. The latter have one of the two partial valences of interest much higher than the other. In operational terms, the calculation of *lambda* requires that a standard SCB procedure to collect data is carried out, preceded by an initial statement linking the element to its object (e.g., “people usually work in a firm”), and then the verbal sign that assigns the element (“work”) is employed as the stimulus word to which participants provide their responses that further serve as the bases for the calculation of valences.

The role of affect

Finally, something has to be said about affect, as emotions and affective experiences are an essential part of human lives, and our model deals with humans as knowledge systems. So, a model of that sort would be incomplete if at least it did not provide some tentative insertion points for affective components to interact with the knowledge structure – or to be a part of it. Two alternatives can be outlined for the integration of affect into the model.

The first one conceives affect as a moderator of knowledge structures. We speak then of an affective component or characteristic attached to the contents of representation elements, as a class of variables that moderates thinking processes. As such, it would involve the affective load of personal and social representations: the intensity of emotional activation associated with a content unit within the structure. This conception implies that each element has an affective dimension or component that cannot be dissociated from it, ranging from low affective intensity – the case of neutral elements, which do not stir much emotion – to high. How would a highly affective element influence the structure? One possibility is that the element might perform an evaluation or judgment role on the structure. Social representations research has already pointed out in that direction of interaction between structural roles and affective loadings, even if different terminologies were employed. Moliner (1995) referred to an evaluative dimension of representation elements, which had similar functioning to that of attitude processes. Likewise, as already mentioned, Lheureux *et al.* (2008) obtained results that supported the view that all representations elements have both a semantic and an evaluative component.

An extension of the fore mentioned conception of affect in our model involves the generalization of affective loadings of elements to the whole structure, meaning that the representation itself can have a general affective loading. This can be achieved through different mechanisms; for instance, it is likely that the affective components of central elements exert more influence on a general affective profile of the representation than those associated with peripheral elements. Still, in specific contexts peripheral elements might be salient, which could impact the loading of the representation. Most likely, the processes happen all at once: there is a joint effect of the loadings of elements, taking into account their structural roles and the directions given by environmental contexts to activate specific elements in a given situation.

The results of research about representations of affect-charged objects also point out to that interpretation. In those cases, people tend to resort to simpler reasoning structures and direct actions and beliefs according to a very restrict number of elements that have a highly affective profile (cf.

Wolter, 2009; Guimelli & Rimé, 2009). According to this perspective, an affective context – whether caused by an environmental constraint or by the affective nature of an object – is likely to be associated with a change in the operation and organization of the structure; in other words, it is as if a representation structure, if sensitive to affective loadings, might assume various configurations and be subjected to different operation rules, depending on the intensity of affect. As a way to simplify the basic idea, it is as if for some objects there might be processing through a low-affect operation mode and a high-affect one. The possibility to change from one to the other would then be linked to the permanence of the affective level associated with the representation and its elements; some might fluctuate according to environmental constraints, whereas other objects might be more stabilized in a low or high affect state.

A second conception of affect is a more radical alternative. Rather than a parallel component, affect would be essentially connected to pieces of knowledge; it would be part of it. If the basic cognitive schemes model is observed, some connectors are intrinsically likely to be closely associated with high affective levels; such are the cases of EVA and NOR, for example (evaluative and normative relations, respectively). It is yet to be verified if such relations are only true within a system when linked to lexical units that have a more qualifying nature in themselves (e.g., having the value of suitable adjectives), or if it is the relations that give that qualifying value to otherwise 'common' verbal signs.

Those two alternatives – affect as a moderator of knowledge and affect as part of human knowledge – have their advantages and disadvantages in terms of plausibility and operationalization. The moderator conception is probably simpler to translate into methodological strategies, but it might oversimplify things and do not find the best correspondence with the way human cognition operates in other levels of analysis. In contrast, the affective knowledge position might accommodate the complexity of human thinking better, and correspondingly is more challenging to convert into concrete research. As mentioned, the moderator conception is the one inspiring most of the research of the structural approach that is concerned with affective phenomena in social thinking, and it has obtained useful and interpretable results.

Final remarks

The presented model provides a framework to situate the research on personal and social representations that is coherent with a structural approach on social thinking. It is the product of a

synthesis of existing literature on the structural approach, grounded mostly on Codol's (1969) and Rouquette's (1994a) guidelines, with adjustments and derivations aimed at accommodating a certain diversity of phenomena and research within a single conceptual grid that is coherent with the structural approach presented in Chapter 1.

It is a view of representational phenomena that focuses the formalization of declarative knowledge into organized structures, which we attempted to make compatible with social and affective aspects of thinking. Still, it is probably a model of representations that might be viewed by some authors (e.g. Parales Quenza, 2005) as being "social cognition-friendly". It is important to make it clear that it covers only one possible understanding and way of dealing with the phenomenon of representations. Other perspectives focused on dialogicality (Markova, 2003), social anchoring (Doise, Clemence & Lorenzi-Cioldi, 1992) or narratives (Laszlo, 2008) tackle the problem differently.

Some limitations and peculiar characteristics must be pointed out. It must be again stressed that it is restricted to declarative knowledge, leaving procedural knowledge aside from the formalization effort. While such restriction enables reasonable precision to characterize the information contained in the knowledge structures described and the organization of representations, on the other hand it must be admitted that the model does not deal with prescriptions linked to practice and action directly; at the most, they might be inferred in terms of compatibility with declarative schemes. As such, one might have difficulty in identifying social representation cognems associated with implicit or unconscious activation.

Additionally, as stated, the integration of affect into the model is neither satisfactory nor final. Two alternatives were presented: one more practical, affect mediating knowledge; the other more realistic, affect as part of knowledge. While the second is perhaps more interesting and safe from a theoretical point of view, the first one has also stimulated research and produced relevant results. Moreover, one cannot also discard the possibility that both alternatives are not entirely exclusive. It is acknowledged that the model prioritizes the formalization of knowledge, and there is need of further thought and research to precise the role of affect relative to representational structures.

The mentioned conceptual system will be the framework employed in the present research work. In the next chapter we will switch our focus to the structural relations involving social representations. We will review the literature about such relations, which includes the theoretical positions about the notion of representational systems. Finally, we will base ourselves on Flament

and Rouquette's (2003) taxonomy of the relations involving social representations to situate our research interests.

Chapter 3: Structural relations among social representations

After dealing with the topic of social representation structure, an almost automatic following step involves tackling the relationships maintained by two or more social representations in a group's knowledge universe. A first position concerning relations involving social representations was given by Moscovici (1961/1976) when he proposed that social representation contents were anchored in preexisting knowledge, which provided the interpretation resources to construct new representations. This means that every social representation is classified and understood by a population according to knowledge that already exists within a group, serving as a reference point. Breakwell (1993) pointed out this essential level of relations among social representations: a clear derivation of the anchoring process is that social representations are organized in networks.

In structural terms, it means that each representation is inevitably connected with other social thinking formations, and that is already a first possibility of understanding the relations involving social representations. If we have a representation on [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 a strict sense, every representation forms vast networks with other representations.

The first theoretical and empirical perspectives

Di Giacomo (1980) was a pioneer in studying the interaction of sets of social representations, as he showed that the outcome of a students' protest movement could be explained by the representations that the student population shared about itself, about the leaders of the movement and their strategies. Since students considered that the protest committee and their culture were different from the student population, the protest eventually failed to generate long-term adhesion. Such conclusion would not have been reached if those social representations had been studied separately.

Bonardi, De Piccoli, Larrue and Soubiale (1994) were the first to state explicitly that if a social representation is an organized whole, it is also possible to consider that the set formed by interdependent social representations is an organized whole of a higher level. They called that higher level whole representational field, and reported results with evidence of the existence of interdependence between the social representations on [Europe] and [politics], as the word

associations related to both objects allowed the identification of semantic equivalences and were statistically associated. Moreover, the authors hypothesized that possibly dependency might involve coordination, hierarchization or subordination relations between two or more social representations.

Contributing to the theory about relations among representations, Flament (1994a) 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 on [work] and 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. Another mentioned example involves the [ideal group] and the [firm]. <Hierarchy> is a central element on the representation on the firm, and a peripheral notion concerning the ideal group.

In a similar direction, Rouquette (1994b) 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. Bonardi *et al.* (1994) employed the expression "representational field" to refer to integrated sets of representations, while De Rosa (1995) used the word "constellation"; Milland (2001) called those sets "families".

We will adopt the term employed by Garnier (1999): representational system. Like Bonardi *et al.* (1994), Garnier stated that different representations that maintain structural relationships with each other at the level of their structures form a system. She conducted research about the representations of nursery and school-age children on three objects: [body], [health] and [environment]. Those representations are contextualized in a system about human relations. Her results showed a pattern according to which isolated representation structures are formed first, and at a later development stage those representations become associated through structural links, operationalized by similarities in evoked words for the three objects.

Milland (2001) obtained results with the representations of students and young unemployed workers on [work] and [unemployment] that supported a view opposite to the one suggested by Garnier (1999). According to his results, the representation on [unemployment] is structured having the representation on [work] as a normative reference point, in the case of students who do not have any direct experience with both objects. It is only at a later developmental stage of group history, when those students become unemployed workers, that the representation on [unemployment] acquires an independent normative system and gains more autonomy. Also important in Milland's work is the understanding that he advances, based on a conception from Rouquette (1994b) that

representations might be connected, that within a representational system (or a family of representations, as Milland puts it) a transformation in one representation might bring about a transformation in another representation of the same system.

More recently, Pianelli, Abric and Saad (2010) conducted research demonstrating that the social representations of drivers on [speed] and [speed limitation] form a network with the emerging representation on a technological device developed in France to control car speed, named LAVIA. The associations found in their results suggest that the representation related to [LAVIA] technology is generated anchored to representations of subgroups of drivers with different profiles regarding driving behavior and the other representations of the system; this also supports the position that understands the genesis of social representations as a process linked to preexisting representations.

Based on Codol's (1969b) perspective that stated that related representations act as components of a more complex representational construct, Campos and Lagares (2002) advanced the position according to which for some social objects the unit of interest is a representation system comprising objects that are pertinent within a broader situation. They applied this perspective to study the social representations of drivers on [traffic], understood as a representational system including representations of the drivers about themselves, about other drivers, about the task of [driving], and the overall context of [traffic].

Two other studies identified the existence of inter-representation relations at the level of word evocation associations. Larrue, Bonardi and Roussiau (2000) investigated the social representations of students on [politics], [right-wing] and [left-wing] and observed that only the relations between the representations on [right-wing] and [left-wing] were significant. Valence and Roussiau (2005) observed semantic equivalences in the structures of three social representations: [Human Rights], [democracy] and [institution], and through a provoked change in a central element of the social representation on [Human Rights] they verified that its structure was transformed, as well as the structures of the other two representations. That was interpreted as a sign of a network organization binding those three social representations.

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 (Rouquette, 1988, 1994b, 1996b, Flament & Rouquette, 2003), 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, that are activated according to situation demands (Flament, 1987; Milland, 2001). In addition, the consequence of the anchoring process that was mentioned in the beginning of this chapter, 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.

A classification of structural relations involving social representations

Flament and Rouquette (2003) proposed a broad taxonomy of structural relations involving social representations, distinguishing between two general classes: field effects and coordination relations. Field effects can be identified when there is interference on social representation structure from higher levels of the social thinking architecture, such as ideologies or *thêmata*. Those higher order formations often cause interference related to higher-order values that lead to apparent contrasts in representation structure, when in fact there is only a co-presence of social factors that accounts for identified differences, rather than two or more different representations. The authors illustrate this through the case of the representations about professions associated with the gender of the professional, as for example the representation on the nurse. There is only one such representation, and yet if people are asked to characterize a “male nurse” and a “female nurse”, probably the contents of results will be very different. This is due to the ideological loading conveyed by the notion of gender, an opposition that has strong historical roots and therefore modulates social representations if mobilized by a context. Usually, those variations that are explained by field effects are found at the level of the peripheral system only, which means that most often situations involve one and only representation, subjected to a field effect.

In this sense, a field effect is not really a type of relation between representations, but rather the case in which one representation is trespassed by more general values and segmented according to guidelines from constructs from higher levels of the social thinking architecture. As commented in Chapter 1, the formations from the uppermost levels of the architecture have very broad application potentials, and thus they can affect wide sets of representations.

The second general class of relations proposed by Flament and Rouquette (2003) consists of the cases in which social representations get into relationships with other social representations, i.e horizontal relations with formations from the same level of the social thinking architecture. According to central core similarity, coordination relations can be classified in two subtypes: disjunction and conjunction. We refer to disjoint representations when there is no intersection whatsoever in the cores of related representations, in terms of a coincidence of verbal signs referring to elements (not taking into account the level of connectors). As an example, if a fictitious social representation, [house] has a core with two elements, <house-doors> and <house-walls>, and a second representation, [car] has a core formed by a single element, <car-engine>, then [house] and [car] are disjoint social representations: there is no coincidence of elements in their cores.

According to Flament and Rouquette (2003) conjunction involves representations with intersecting central cores. In our previous example, if <car-doors> is added to the central core of [car], then [car] and [house] would be joint social representations.

We propose to extend the conjunction relation also to the case in which the object label that refers to one of the representations is contained in the structure of another representation. If that is the case, then another possibility of a conjunction would be the inclusion of <house-car> in the core of the representation on [house]. We will refer to conjunction in the present text according to that broader conception.

So far, three types of conjunction have been identified by research. There is a relation of embedding or dependency between two representations when one social representation depends primarily on the structure of a second representation; we say then that the first structure, referring to the object of a higher level, is subordinate to the second one, of an inferior level. In those cases, the subordinate representation contains an element in its central core that is identified by the same verbal sign that identifies the object label of the superordinate representation. In turn, the object label that refers to the subordinate representation is found as a peripheral element in the structure of the superordinate representation. That relation was identified in a study conducted in France by Abric and Vergès (1996) about the relations among the social representations on the [bank], [money] and [profit]. Their results indicated that the representation on [money] was the superordinate representation, with [bank] depending on it and on its turn playing a superordinate role in comparison with [profit], which was the subordinate representation. Fraissé (2000) also identified an embedding relation involving the social representations on [conventional medicine] and [alternative medicine] at the level of isolated SCB connectors. Her results pointed out that for people who did not make use of alternative health treatments, the social representation on

[alternative medicine] fitted into the structure related to [conventional medicine]. Pianelli, Abric and Saad (2010) identified associations among the social representations on [speed], [speed limitation] and [LAVIA], a speed-limiting device for cars, and inferred an embedding relationship with [LAVIA] as dependent on the other representations; it is important to note, however, that the authors did not observe the pattern of element intersections that was mentioned; the expression embedding was employed in a more permissive sense.

A second conjunction type is called antinomy or opposition. The relationship of antinomy occurs when social representations have at least one theme in common in their cores, and that theme is expressed as opposed elements in both representations. Other than that, each representation has other specific central elements. An investigated example is the relationship between social representations on [security] and [insecurity]; they have two common themes in their cores, delinquency and employment. [Security] has <absence of delinquency> and <availability of employment> as its core, while the core of [insecurity] core has <presence of delinquency> and <unavailability of employment>, thus pointing out to an antinomy relationship (Guimelli & Rouquette, 2004). Milland's (2001) results on [work] and [unemployment] also indicated that their cores shared the same themes with element contents being opposite, characterizing an antinomy relation. Finally, Sarrica and Wachelke (2010, in press) have carried out a study to verify if the representations on [peace] and [war] maintained a relationship of antinomy, but found out that it was not the case, as elements from the core of one representation had their opposites in the peripheral system of the other, which served as evidence that the two representations were disjoint. This means that the notions might be independent, or that eventual associations cannot be retrieved in terms of the composition of their cores.

The third and last identified type of coordination is called a reciprocity relationship. Two representations are said to be reciprocal when each of their object labels is present on the central core of the other representation. Such a phenomenon happens with the representations on [work] and [money] (Abric & Vergès, 1996); one object is not conceived by people without recurring to the notions contained in the associated object.

Figure 2 presents a scheme that illustrates the mentioned relation types involving representations, at three levels: level of the structural relation on the social thinking architecture, existence of an intersection involving representation cores and object labels, and types of coordination relations. Concerning the level of the architecture, representations might be subjected to the influence of ideological constructs in the case of field effects, or they could maintain horizontal coordination relations with other representations. Coordination relations might take place

with representations that have common elements on their cores (conjunction) or disjoint representations with no coincidence of that kind. Finally, there are three possible conjunction coordination types that have been identified by literature: embedding (e.g. one representation is subordinate to another), antinomy (e. g. one representation takes an opposite sense to another) and reciprocity (e. g. two representations are mutually interdependent).

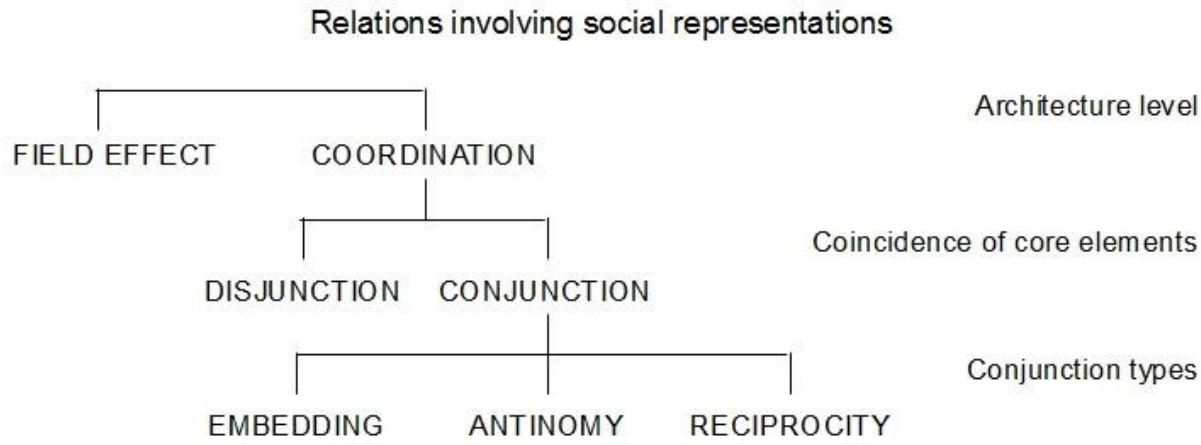

Figure 2. Relation types involving social representations that have been suggested by literature.

It is important to point out that any kind of coordination relation involving social representations contrasts to a situation of independence, that is, the case in which social representations are not directly related to each other in terms of structural associations. The case of independence is of no interest to us here, as a standard model on representation structures that are considered separately (e.g. Chapter 2) accommodates it adequately.

Aims

There is a remarkable absence in the agenda of theoretical and empirical structural research about the relations among social representations. Even if the general configurations of coordination relations have been identified in terms of top-bottom coherence and the existence or not of intersections of social object and cognem labels, there is no development concerning the structural processes through which those relations take place, both in the case of joint social representations - that is, representations that have coinciding verbal signs labeling their central elements or referring objects - and disjoint social representations – representations without that kind of intersection.

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 probably 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 (2003) classification 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 conjunction is needed, describing relations at the level of cognems, independently of specific intersections. Once that is achieved, not only will there be a more general coordination model that may assume different configurations according to a same underlying process, but new paths might also open for the understanding of representational systems dynamics and applied research.

This work aims at contributing to the understanding of processes concerning the structural coordination relations among social representations, involving the activation of cognems from related representations. If two social representations are associated forming some kind of relation configuration, then there must be a model able to explain the activation of a social representation cognem or object label from another one that is coordinated with it. In other words, a theoretical model that makes it possible to identify inter-representation coordination relations at the level of cognems is needed.

To do so, we need first to characterize the structural aspects of a representational system, to later propose a theoretical model concerning coordination relations applicable to both joint and disjoint structures, and then verify if that conception proves itself useful when confronted with empirical data. General and specific aims are listed after the end of the theoretical part of the thesis.

We will work with a representational system having the social representation on [aging] as a reference point. Next on this work we will present the research aims that will guide us; after that, Part II is destined to cover the empirical research aiming at characterize the structure of that representation.

Research aims

General aim

Characterize structural processes regulating coordination relations among cognems from different social representations within a representational system.

Specific aims

1. Identify the cognems that constitute the social representation of young and elderly people on [aging];
2. Characterize the structure of the social representation of young and elderly people on [aging] in terms of basic cognitive scheme activation and structural status of cognems
3. Identify the social representations that take part on a representational system containing the social representation on [aging];
4. Characterize the structures of the social representations constituting the representational system;
5. Select a restricted number of social representations based on a higher proximity with [aging] in the representational system, retaining them for further investigation;
6. Characterize the basic cognitive schemes valences of the selected representations when associated with [aging], at the level of relations between social object labels (Object-to-Object relations);
7. Gather empirical evidence supporting the association of cognems from different social representations;
8. Formulate a theoretical model about inter-representation coordination relations to account for inter-representation connection points at the level of cognems (Cognem-to-Cognem relations);
9. Identify inter-representation connection points at the level of cognems within the representational system;
10. Verify if the manipulation of the validity of content of a cognem within an inter-representation connection point is associated with changes in the activation of relationships maintained by it with a cognem from another representation in the same connection point;

11. Evaluate the adequacy of the formulated theoretical model on inter-representation cognem-to-cognem coordination relations involving social representations.

Part II: Structural characterization of the social representation on aging

Chapter 4: Structural characterization of the social representation of young and elderly people on aging: exploratory research conducted in Italy and Brazil

In order to state the pertinence of framing aging as a social psychological object, we will provide a brief review about the topic, dealing with aging as a scientific object of study, with the increased relevance of beliefs about aging and old age due to a demographic phenomenon – world population aging – and then address the topic as a social representation object. Further, we outline a research effort directed towards a structural characterization of the social representation on [aging]. The focus of the chapter is the study of [aging] as an object that is suitable to the study of representational systems; the interest is not of studying aging processes and related theories in depth.

Aging as a scientific object

Aging is the term employed in a biomedical perspective to refer to the broad and multidimensional process that happens after the sexual maturation of a living organism and exerts influence on its functions, reducing its probability of survival with the passing of time (Neri, 2005; De Beni, Borella & Mammarella, 2009). An organism at an advanced aging stage is said to be in old age, the last phase of life, which precedes death. For the human species, usually the ages of 60 or 65 years old (respectively for developing and developed countries) are considered to signal the beginning of old age; yet, it may also be divided in subphases. People aging from 65 to 74 years old are called "young elderly"; from 75 to 85, "elderly", and over 85 years of age there are the "grand elderly" and "centenarians" (De Beni *et al.*, 2009).

Siqueira, Botelho and Coelho (2002) have identified four scientific perspectives to study aging. A biological-behavioral perspective frames aging as a process of cellular loss and reduction of functional capacity, consisting of a problem that needs to be neutralized or reduced. In addition, population changes and corresponding public policies are also object of study. The focus of a second perspective has an economic bias: the relationship between old age and loss of productivity. Special attention is thus dedicated to the phenomenon of retirement. A third perspective is called sociocultural, proposing that aging and old age are arbitrary social constructions, and pointing out to the discussion of the adequacy of related terms and processes such as Third Age, elderly and old. Finally, a transdisciplinary perspective stresses that aging is a complex process that should be

conceived as a whole, trying to avoid reductionism and aiming at integrating knowledge from different sources.

Gerontology is the name given to the multidisciplinary scientific field that studies aging. The psychology of aging is a subfield of gerontology that investigates and evaluates the stability and change in psychological processes during life, from a life-span perspective (De Beni *et al.*, 2009). From the 1990s, there has been growing interest in psychological variables associated with aging, with emphasis on topics such as learning, memory, emotion, social cognition and cognitive neuroscience (Zacks, Blanchard-Fields & Haley, 2006).

Biological aging is multidetermined, as a variety of factors act jointly to manage the changes an organism comes across in its life span. There are theories that try to explain aging through different mechanisms. At a cellular level, harmful substances called free radicals result from cell processes, and eventually attack DNA itself; their action is cumulative and thus associated with chronological age, triggering and intensifying aging. Hormonal activity changes are also associated with the process (Scortegagna, 1999; De Beni *et al.*, 2009).

However, it is important to indicate that there is no necessary overlap of biological (chronological) age, psychological age and social age. Psychological age is the subjective feeling and level of response that is given to the environment and performance. Social age is the relative position in society that one has in terms of their occupation, and changes from occupation to occupation (e.g.: a scientist's or a writer's professional peak happens at a later age than an athlete's) (De Beni *et al.*, 2009). As such, aging is a set of processes that is only thoroughly characterized if biological, psychological and social levels are taken into account.

According to a life-span perspective (Baltes, 1987; Neri, 1993), development takes place during the whole life course, and no developmental process prevails over any other. There is a coexistence of cumulative (continuous) and innovative (discontinuous) processes throughout development. The aging process is multidimensional and multidirectional, involving constant balance between losses and gains in different aspects of organic life (cognitive, physical and emotional). Some cognitive schemes and systems may compensate the decrease in functions. The characteristics of personal development result from the interaction of age, historical and personal events; it comes to be that old age is the most heterogeneous of all human life periods, as the combination of events from previous stages provides a wide array of different possibilities.

The physical changes associated with aging affect many organic aspects. People become a little shorter due to the weakening of muscles and the influence of gravity on spine bones; they tend to gain weight due to decrease in metabolism; the skin becomes less elastic resulting in more

wrinkles. Bones lose density and there are also more problems related to vision and hearing (De Beni *et al.*, 2009). There is a decrease also in the levels of cognitive functioning, including memory, reasoning and abstract thinking; in contrast, verbal abilities and skills acquired through experience remain unaffected and may even be improved, as the brain has high plastic potential in the absence of illness (Scortegagna, 1999; Charchat-Fichman *et al.*, 2005; De Beni *et al.*, 2009).

Overall environmental adaptation usually decreases, and a proportion of the elderly people population presents reduced functional incapacity, or moderate or severe dependency (Rosa *et al.*, 2003). Depression is also a frequent problem in this phase of life (Gazalle, Hallal & Lima, 2004; Antunes *et al*, 2005;). Even so, a large proportion of the elderly perceives themselves as being adjusted or as people with a positive development or high degree of competence (Neri, 2002; Queroz & Neri, 2005; Marigo *et al.*, 2009).

In old age, the probability of facing health problems and illness is higher. When incapacitating conditions emerge, quality of life is considerably affected. Nevertheless, it is not correct to consider old age and illness as synonyms, as it is possible to live decades of old age without significant onset of disabling health problems, due to a combination of genetic and environmental factors (Scortegagna, 1999; De Beni *et al.*¸ 2009).

Departing from the understanding that it is possible to minimize the impact of the negative events associated with aging and maximize the positive ones, gerontology and the psychology of aging broadly aim at discovering the conditions that make it possible for people to age well (Garrido & Menezes, 2002; De Beni *et al.*, 2009; Marigo *et al.*, 2009). There is a variety of different positions in literature that are somewhat complementary in the propositions and theoretical conceptions of what it is a more or less successful aging process and what it takes to achieve it.

A life-span-based perspective suggests that successful aging is a composite of satisfactory physical health, individual flexibility and continued education (Neri, 1993). It is possible if new resources from the organism make up for the losses associated with aging, enabling a reorganization of daily activities and adapting to a changed reality. This takes place through a selection of new goals in order to keep high functioning levels in activities, optimization of the activities and processes related to those new goals, and use of new cognitive and affective strategies in order to compensate for losses and maintain or improve performance related to the selected domains. In other words, successful aging, according to the life-span perspective, is a new balance achieved through a reorganization of organism resources to face new limitations (Baltes & Baltes, 1990).

The World Health Organization established good aging as a goal to be made possible through a series of policies. Good aging then takes place if a condition of active aging is satisfied.

According to this perspective, active elderly people optimize health, social participation and security. Active aging is associated with a set of behavioral and personality factors. Behavioral determinants are related to lifestyle, such as the undertaking of physical exercise, proper dieting, avoiding smoking and drinking, whereas personality variables involve coping, self-efficacy, internal control, pro-social behavior and positive thinking (World Health Organization, 2002; Marigo *et al.*, 2009).

Finally, the positive aging movement focuses on the gains associated with aging, rather than on the shared negative views that conceive the old age as a period marked by decline. Such perspective is grounded on the idea that the beliefs, conceptions and stereotypes on aging and old age are social constructions that can be changed to more adequate and positive ones, and that if the positive dimensions of the process are emphasized, it is possible to bring about a radical change in the way that old age is understood by people (Gergen & Gergen, 2000). The positive aging movement is then a stream situated within a sociocultural perspective, among the ones identified by Siqueira and collaborators (2002).

In the past decades, the theme of aging has stimulated growing scientific interest also because of a macro social change that affects societies worldwide, indicating the increasing importance of related topics: the world population aging phenomenon.

World population aging

The world is aging. Global population aging is the process in which both population mortality and fertility decrease, so that elderly people gradually gain a higher proportion within overall population, and life expectancy at birth increases worldwide (Kinsella & Velkoff, 2001; United Nations, 2001).

In 2007, there were around 704 million people in the world who were aged 60 or over, which corresponded to 10.7% of overall population. There were 495 million people aged 65 or more years (7.5%). In 2050, the number of people over 60 will rise to 1.968 billion, adding up to 22% of overall population and overcoming the proportion of children (people aged 0-14 years) for the first time in history (United Nations, 2006, 2007).

From 1980 to 2000, life expectancy at birth around the world increased 20 years (from around 46 years old to 66). Yet, such increase has been unequal: for the most developed countries (Western Europe, United States, Canada, Japan, Australia) it was of 9 years old, whereas life expectancy for the less developed regions (remaining countries) increased 23 years, pointing out to

a very fast change in population structure; currently, developing countries are aging faster than the developed world (United Nations, 2001).

Europe is the continent in the world with the highest proportion of people over 60 years old: as of 2007, there were 153 million people over 60 years of age (21.1%) and 116 million over 65 (16.1%). Africa is the "youngest" continent, with only 5.3% of its population at age 60 or older (50 million) in 2007, and 3.4% (32 million) over 65 years. In 2050, it is projected that Europe will have 34% of its population over 60 (225 million people). In Africa, the elderly will be 10% of the population then (192 million), Of the remaining regions, Northern America (United States and Canada) and Oceania have numbers that are closer to the European standards, with respectively 17.3% and 14.4% of people over 60 years old in 2007, attaining the proportions of 27% and 25% in 2050 (United Nations, 2006, 2007).

Italy holds one of the top positions among the countries with the oldest populations. Currently 26% (over 15 million Italians) of its population is 60 years old or older, which makes of Italy the 2nd country with the highest proportion of elderly people in the world, just behind Japan (at 27.9%). In developed countries, usually the mark of 65 years old is taken as the cut-off point for old age, and if it is taken into account, then 20% of the Italians (about 12 million) are that age or above. In addition, since most of the research that composed the present work was conducted in Padua, a city in the North-east region of Italy, it is important to present the proportion of people over 65 years of age at a state and regional level. At respectively 21.1% (North-east Italy) and 19.7% (Veneto region), they are close to the national numbers (Istat, 2009; United Nations, 2007).

On the other hand, Latin America and Asia have a distinguished position. Currently they are young regions, with correspondingly 9.1% (52 million) and 9.6% (385 million) of their population at age 60 or more, but the pace of population aging will be much faster than what has taken place so far for the most developed regions of the world: in 2050 the Latin Americans over 60 will be 25% (188 million), while 24% of the Asians (1 billion 231 million) will be in that condition (United Nations, 2006, 2007). That faster demographic transition is mainly due to the fall of fertility rates, that is, the amount of children that a woman is expected to have in her reproductive years. In developing countries, such as Brazil, fertility curves dropped in a much steeper curve throughout the middle of the 20th Century, in comparison to European countries such as England (Carvalho & Garcia, 2003; IBGE, 2006). As a consequence, Latin American and Asian countries are facing deep demographic changes, and are bound to switch from being "young" regions to being "mature" ones in record time. In 2010 it is estimated that 9% of Brazil's population is over 60 years of age (17

million Brazilians). By 2050, that proportion would increase to 25% (63 million) (United Nations, 2006).

The longer life made possible by advances in medicine and the phenomenon of world population aging have given higher social relevance to the topic of aging, making of it a more pervasive social communication theme. The characterization of aging as a social object, and therefore as a likely object of social representations, is presented in the next section.

Aging as a social object

There are two immediate consequences of population aging for society. First, the economic burden of the elderly increases; as a large proportion of elderly people no longer work, due to various reasons, it depends on the economically active younger people. With the rise of proportion in the population, the economic weight of the elderly is then bound to increase. A second consequence is related to the fact that with the rise in life expectancy, more young elderly people (from 60/65 to 80 years old) will have to take care of their parents and relatives aged more than 80, which is likely to bring about changes in family structure (United Nations, 2001). Those are evidently not the only consequences of that global process, but they represent good examples of social changes to affect people at intergroup and interpersonal levels, in correspondence with the increasing importance of aging and old age as social issues.

But is it possible to think of aging as a social representation object? As mentioned in Chapter 1, some authors have suggested a few criteria guidelines in order to evaluate the possibility that a given object is a social object, i.e. a theme that is pertinent to the lives of people from various social segments, and about which they talk and express different opinions (Flament & Rouquette, 2003).

The three conditions proposed by Moscovici (1961/1976) to define a social representation object seem to be valid for the [aging] object: dispersion, focalization and pressure to inference. Information about the theme of aging is disperse in various sources and channels of social life (mass media, scientific diffusion material, folklore, and others), which makes its definitions ambiguous. Additionally, focalization is ensured as people from different groups have different perspectives and interests on [aging]. A brief literature on the studies about social representations on [aging], to be presented in the next section, indicates that the main social segmentation in terms of differences of group knowledge regarding [aging] consists of age groups. For instance, elderly people at 70 years of age might think that old age is a period in which one takes the time to reflect

on life and balance past experiences, while teenagers possibly see it as a negative period in the future in which one is weak and cannot practice sports properly anymore. Finally, a pressure to inference is also there; due to population aging, people come across elderly people and practical situations concerning [aging] more often, and probably feel the need to have knowledge on the topic. A few possible examples include deciding how to face the old age of relatives, parents or one's own aging process or a situation of coexistence of elderly and young work colleagues in a same company. In those cases, one must act, and therefore must resort to available knowledge on the topic to base practices.

As already pointed out elsewhere (Wachelke, 2008), the analysis of some of the complementary criteria proposed by Moliner (1993a) also indicates that [aging] is likely to be a social representation object. A first criterion is that an object must be polymorph, that is, refer to a general class that may be expressed in various instances in society. [Aging] is a "grand" theme that has been an important topic for humanity throughout history. It is a topic that is expressed in different particular contexts: old age, the quest to remain young, how to take care of one's mind and body, its relationships with death and time, and so on. A second criterion requires the identification of a relevant intergroup context. As mentioned previously and evidenced by scientific literature, differentiation at the level of intergroup knowledge on [aging] involves age groups. Finally, a third criterion involves the identification of a stake value for the object, in relationships with pertinent groups. If we are to consider two contrasting age groups – young and elderly people –, the understanding that [aging] has different stake values for both of them can be advanced. For young people, [aging] is most likely an abstract threat that eventually comes into play in their everyday lives when they face situations involving elderly people or cues that refer to aging processes. Thus, for the young, [aging] might come into play in the form of eventual problems, and has a conjunctural stake configuration. In contrast, the identity of elderly people is somewhat defined by [aging], as one recognizes him or herself as being old if a certain length of time has passed, if related aging processes are already at an advanced level, or if others perceive him or her as belonging to the elderly people category. That corresponds then to a structural stake.

Also, it is likely that cultural contexts provide relevant social segmentation to differentiate group knowledge about [aging]. Societies differ in the pertinence given to the topic of aging at a given moment; the proportion of elderly people in the population, the rate of population aging and differences in values and representations that might affect the beliefs and evaluations about elderly people, old age and aging are some of the factors that justify the understanding that people from different cultural contexts might constitute groups with different social representations. Cultural

contexts are understood here as "block" variables comprising the experiences that are similar to people from a same country and socioeconomic and educational background. Lehr (2002) pointed out the importance of conducting transcultural research about aging, and that can certainly be extended to the study of social representations related to it.

What has just been said seems to extend to Flament and Rouquette's (2003) conditions: [aging] and [old age] are concepts that refer to an explaining class and are employed to occurrences of sets of related phenomena; people from different age groups share experiences and communicate about those themes with different views about them; and actions, behavior and discourse about [aging] and [old age] are associated with beliefs and opinions about those topics. All in all, it does seem legitimate to classify [aging] as a social object associated with a social representation, which justifies the research efforts that have been carried out in the direction of characterizing group knowledge about [aging] and [old age].

Social representations on aging

The international literature on attitudes, stereotypes and social representations related to [elderly people], [old age] and [aging] in general points out to a mixed representation formed by positive and negative elements. In terms of content, very often the social representations on [aging] or the elderly person are practically interchangeable, and they are constituted by two dimensions that correspond to biological and psychological gains or losses derived from the aging process. Such pattern has been identified in studies conducted in countries from Europe, such as France (Coudin & Beaufils, 1997; Moliner & Vidal, 2003; Gaymard, 2006) and Italy (Gastaldi & Contarello, 2006; Hubbard, 2007; Macedo Nagel, 2008), but also in Argentinian (Monchietti, Cabaleiro, Sánchez & Lombardo, 2000) and Brazilian samples (Veloz, Nascimento-Schulze & Camargo, 1999; Novaes, 2001; Novaes & Derntl, 2002; Mithidieri & Tura, 2003; Santos & Meneghin, 2006; Wachelke, 2007; Wachelke *et al.*, 2008; Magnabosco-Martins *et al.*, 2009). It is important to point out that in spite of the existence of different national cultures and population age structures in those countries, results related to representation content were remarkably similar. Differentiations in representations were identified in terms of age, gender and occupational groups.

Considering differences between age groups, the elderly tend to mention more concrete and positive elements on their representations, in comparison to the young, at least in some Italian (Gastaldi & Contarello, 2006; Hubbard, 2007) and Brazilian contexts (Magnabosco-Martins *et al.*, 2009). In others, such as homes for elderly people, their views on [aging] tend to be very negative,

related to illness and physical and health decline (Araújo, Carvalho & Moreira, 2003; Araújo, Coutinho, Barros & Moreira, 2005; Costa & Campos, 2003; Araújo, Coutinho, Santos & Barros, 2005; Campos & Domingos, 2007). In urban settings, elderly people have a representation based on decline due to the understanding that [aging] is associated with the loss of productivity (Veloz, Nascimento-Schulze, & Camargo, 1999; Santos & Belo, 2000; Oliveira & Santos, 2002). Young people usually share a clearly two-dimensional representation in which <wisdom> is one of the most salient elements, but is followed by a majority of negative elements like <death>, <decline> and <illness> (Mithidieri & Tura, 2003; Moliner & Vidal, 2003; Gastaldi & Contarello, 2006; Gaymard, 2006; Campos & Domingos, 2007; Hubbard, 2007; Wachelke, 2007, 2009; Macedo Nagel, 2008). Middle-aged adults tend to share the representation contents with younger ones to a large extent (Magnabosco-Martins *et al.*, 2009), but as people get older and closer to old age, their representations seem to shift from abstract to more concrete contents (Wachelke *et al.*, 2008) and changes in the work context of retirement seem to also affect their beliefs on old age (Oliveira & Santos, 2002).

Regarding differences on representations that are modulated by gender, some results point out that women stress more the loss of physical beauty and family ties associated with getting older (Veloz *et al.*, 1999), or the decline of functions (Costa & Fávero, 2007), while others refer to young women viewing [aging] more positively than men at their age group (Gastaldi & Contarello, 2006) or do not provide clear difference patterns (Nagel, 2008). There are also results that indicate that even if the representations on grandparents' roles are usually characterized by family and affective support, there are cultural differences concerning the perceptions of elderly men and women in the role of friends (Duque, 2002). Overall, social representations on [aging] and gender are apparently to be considered in specific contexts and no clear trend can be outlined from past research.

It is pertinent to note that social representations of professionals dedicated to the medical and nursing care of elderly people are also marked by the same types of contents of those found in studies with samples from the general population, with few differences in content emphases (Novaes, 2001; Novaes & Derntl, 2002; Mithidieri & Tura, 2003; Gaymard, 2006; Santos & Meneghin, 2006; Costa & Fávero, 2007; Wachelke, 2007). Additionally, research that analyzed media production indicates that either [aging] is represented very negatively in terms of physical loss (Nascimento & Barra, 2007), or is portrayed in a way that privileges denial or clear distortions of related events (Kessler, Rakoczy & Staudinger, 2004; Hubbard, 2007). Moreover, [aging] is a subject that is featured in few advertisements (Hubbard, 2007; Mastrovito & Leone, 2008; Leone, Mastrovito, Polo & Contarello, in press). Parales and Dulcey-Ruiz (2002) have conducted a

discourse analysis of Colombian press articles and have identified four frames that organize the communication about the topic of [aging]: experiences and relations, social security, socioeconomic problems and challenges, and health and illness.

Studies aligned with the social cognition tradition, dealing mostly with attitudes and stereotypes related to aging and the elderly, also provide useful results to understand the contents of representations. In terms of stereotypes, studies show mostly a negative bias against the elderly, although other variables such as the quality of contact with elderly people, target gender, differences in target age and study design can moderate the results (Hale, 1998; Kite, Stockdale, Whitley & Johnson, 2005). Similarly to what could be concluded from social representations research data, those from the stereotypes field also indicate that evaluations of the elderly are multidimensional and affectively mixed; that is, formed by both positive and negative traits. There are good and bad stereotypes related to the elderly (Brewer, Dull & Lui, 1981; Hummert, 1990; Fiske, Cuddy, Glick & Xu, 2002; Kite, Stockdale, Whitley & Johnson, 2005), what seems to reflect the gains and losses dimensions found on the related social representations. Among younger and older people, the stereotypes are similar in content, but they grow in complexity as people get older (Hale, 1998; Hummert, Garstka, Shaner & Strahm, 1994). In terms of differences among cultures and countries, while there seem to be cultural variations in the use of stereotypes in Western and Eastern micro cultures (Seefeldt & Ahn, 1990; Liu, Ng, Loong, Geel & Weatherall, 2003), in general terms, in more recent studies, results from countries from different parts of the world were considerably similar (Cuddy, Norton & Fiske, 2005).

Studies also point out that, for elderly people, stereotypes on the elderly are specially important because they deal with them directly; those are stereotypes learned and internalized in childhood and adolescence that later become self-stereotypes (Levy, 2003). Elderly people do not relate to the negative elements of stereotypes as much as to the positive ones (Robinson & Umphery, 2006). They can also often try to adopt strategies to repel the label of elderly or old age, such as identifying with younger ages or referring to themselves as special cases of elderly people (Montepare & Lachman, 1989; Jones, 2006). In social representations research, there are also data that show a similar phenomenon. Frequently, negative contents of the social representation on [aging], with elements such as <death>, <illness>, <decline> and others are associated with denial on the part of elderly people of such a scenario to their lives, by believing that being old is something that depends on one's "spirit" or will, as opposed to the mere passing of time or physical decline (Veloz *et al.*, 1999; Araújo *et al.*, 2003; Teixeira, Settembre & Leal, 2007; Magnabosco-Martins *et al.*, 2009). Other results serve as evidence that representations and stereotypes can have a

real effect on the well-being and psychological processes of elderly people, on their self-concepts (Korzenny & Neuendorf, 1980), and that priming of negative stereotypical traits interferes in physiological and cognitive activity (Levy, 2003).

Concerning attitudes, results are mixed and context-dependent. In Colombia, Dulcey and Ardila (1976) observed very negative attitudes about the elderly people, both on the part of young and the elderly themselves, especially among lower class workers. In Argentina, Mikusinski and De Urteaga (1982) measured through semantic differential scales the attitudes maintained by Army officers about old age and concluded that they were neutral. In Brazil, there were results that pointed out to favorable attitudes towards old age, by means of the use of Likert and semantic differential scales in a Brazilian context (Neri, 1991). Finally, a German study that made use of implicit attitude measures presented opposed results, in comparison to somewhat neutral ones through regular Likert scales (Jelenec & Steffens, 2002), which indicates the possibility of social desirability interfering on results related to the positioning toward [aging] and elderly people.

As a general note, the structure of the social representations on [aging] or the [elderly person] seems to be formed mostly by elements with clear negative or positive connotations, in various population and international contexts. The reviewed studies show a tendency of a few positive elements being frequently mentioned, such as <wisdom>, <experience>, or <wisdom/experience>, depending on operationalization choices. Those elements are also accompanied by a much larger number of elements that are negative, linked mainly to an approximation of death. Such basic representational themes include the idea of <death> itself, the progressive <decline> of physical body, with a loss in performance and emergence of wrinkles and grey hair. Also, [aging] is associated with <illnesses> that come more often and at a more severe degree, and <dependency> on others and <isolation>. Other elements are not clearly positive or negative, indicating changes in the way of living, with an emphasis on <family life>, and the need to care about one's own <health>.

However, as exposed in Chapter 1, studies focusing purely on contents cannot allow for a description of social representation structure, that is, of the relationships among elements and their hierarchy. Moreover, spontaneous discourse usually does not give direct access to the functioning of social representations (Flament, 1994b). Often there are important elements that are not mentioned in discourse but are an essential part of practice justification (Abric, 1994c), or normative pressures that interfere in discourse or even in the answering of research questionnaires (Flament, 1999; Guimelli & Deschamps, 2000; Flament, Guimelli & Abric, 2006), and as a consequence it is unlikely that research relying solely on representation content can provide an

understanding of the operation of a social representation as an interpreting system of social reality, even if thorough investigations can achieve similar results (Jodelet, 1989a).

There have been few structural studies focusing the social representations on [aging] and the [elderly person]. They were conducted in Colombia, France and Brazil. In Colombia, the research of Rubiano, cited by Duque (2002), investigated the structure of social representations in a specific neighborhood of Bogotá, and identified the elements <loss of capacities> and <decrease in health> as central.

In Brazil, Mithidieri and Tura (2003) identified <wisdom> as a central element of the representation, but also observed that the peripheral system was composed by negative elements. Wachelke (2007, 2009) obtained results that pointed out to the centrality mainly of <wisdom>, but also <health>, <family life> and <physical signs>.

In France, Moliner and Vidal (2003) characterized the central core of the social representation on the [elderly person]. It contained the following elements: <experience>, <illness>, <bad driving skills>, <free time> and <traditions>. Gaymard (2006) verified that nurses and nursing students had a representation on the same object with a core involving the idea of <dependency>, <wisdom>, <experience> and <old age>.

Throughout those structural studies, the most recurrent result involves the identification of <wisdom> or a semantically close element (such as <experience>) as a component of the central core of the related representations. However, the negativity of the majority of social cognition studies related to stereotypes and attitudes related to [aging], as well as the identification of a vast amount of decline-related elements in representational peripheral systems suggest that the understanding of the knowledge and normative bases of the representation is currently unsatisfactory.

Possibilities to explain it might include either the existence of other elements on the central core, or the action of a social desirability effect that might overrate the role of <wisdom> in the representation (Wachelke & Lins, 2008). Moreover, most structural studies were somewhat superficial in the description of structure, limiting themselves to the mere identification or confirmation of centrality related to specific elements (Moliner, 1994).

Also two remarkable absences are noticed. The first one is that no study has evaluated the types of relationships that are associated with [aging] in terms of basic cognitive schemes. The second one is related to the affective component of social representations (Moliner, 1995; Campos & Rouquette, 2000): researchers usually interpret the affective loading of social representations elements related to [aging] either on their own or through qualitative responses. Still no study on

that topic has provided a more precise measurement on the affective values assigned to representation elements. While representations on certain objects can be satisfyingly "grasped" through a confirmation of the central core, [aging] seems to call for more steps of structural investigation, with a simultaneous study of the structural and affective charge dimensions and basic cognitive schemes.

The present study aims at characterizing the structure of the social representation on [aging] and assessing the associated effects of two variables on it. The first variable involves two different age groups: young and elderly people, mainly at the level of structural status of social representation elements and basic cognitive schemes activation profile, but also in terms of the affective loadings of elements. To fulfill that objective, research was conducted with an Italian sample. A second variable that was assessed was national cultural context, and to evaluate it, research was also conducted in two different contexts: Italy and Brazil.

Past research makes it possible to outline a few hypotheses that could guide integrative efforts regarding the functioning of the social representation on [aging]. Advances on research involving the relationships between social representations and social images (Moliner, 1996) allow for an interpretation according to which evaluations of particular occurrences (specimens) of [aging] or elderly people would be based on the interpretive systems of a social representation. The ambivalent nature of the traits associated with the stereotypes of elderly people suggest either that the social representation elements related to them are peripheral, due to their conditionality (Flament, 1994a), or that some of them could be both central and affectively charged, which would constitute representations norms, the criteria to judge if aging processes are 'good' or 'bad' (Moliner, 1995; Lheureux *et al.*, 2008).

Additionally, at a higher level of structural inquiry, no systematic studies linked to social objects related to [aging] have been carried out to understand the modulation of other group belongings such as gender, national and age groups on representation structure. Regarding gender, results of past research point out to peripheral differences, but one has no reason to expect to find a significant difference in representation structure. Differences in particular positioning could lead, though, to variations in evaluation intensity of some elements, such as <family> or <physical aspects>, often associated with women according to some of the reviewed studies.

Cultural or intergroup contexts more or less affected by generational conflicts or large differences in demographic pyramids could probably be associated with different views on [aging]. If people from different cultural contexts can be considered as people from different groups, it is expected that structural differences are identified. Past results from various contexts have not

created expectations of the directions of those differences, but they did not compare representation structures across cultures systematically.

Finally, another factor to take into account while dealing with age groups is the stake value associated with [aging]. Since the elderly are a structural group facing an identity stake, their representation on [aging] says much about themselves, and this would explain their defensive strategies identified in a few studies, either denying membership to the group of elderly people or reinterpreting aging positively. It remains to be seen whether those processes interfere with the elders' group's shared structure on [aging]. In addition, personal connection with [aging], which in structural terms would be called implication (Rouquette, 1988; Flament & Rouquette, 2003; Gurrieri, Wolter & Sorribas, 2007), would probably be related to representation structure and also age group; elderly people are thought to be more implied by aging than the young.

Three empirical studies were conducted. The first one was a preliminary qualitative study directed towards the identification of the social representation elements related to [aging]. The second and third ones were controlled surveys that departed from the preliminary results and aimed at characterizing representation structure of young and mature Italian participants on the representation on [aging] (Study 1-A) and characterizing the structures of the representations from young participants from the two investigated national cultural contexts (Study 1-B). They will be reported separately.

Preliminary exploratory study

Method

Participants

In the preliminary data collection, 12 participants from Padua, a city in North Italy, and 12 participants from Florianopolis, a city in the South of Brazil, were interviewed. They were balanced by gender and age group. Half of the sample was composed by men and half by women. An attempt was made to restrict data collection to a single context, linked to the city of residence and to the university setting, so as to avoid big disparities in terms of sociocultural background. Thus, the three age groups that were included involved young adults (defined as university students enrolled in university graduation courses aged less than 30 years old), middle-aged adults (adults from one generation above students who had a family link with one university student who had or had not participated in data collection. Those could be parents or uncles and aunts, for example.

Additionally, university staff workers were included in this group (independently of having family ties with university undergraduates), and elderly people (two generations above the students, usually grandparents). Therefore, the sample of each country was formed by 4 participants of each age group, equally divided by gender.

Instruments

Associative card

The preliminary study employed the interview technique in two different ways. First, participants helped the interviewer to complete a task called associative card (Abric, 1994d), an association technique that allows for a retrieval of the connections of free evocations, which clears their meaning for the researcher. It consists of an answer sheet with a stimulus word expression in the middle – in the present case: "*invecchiamento"* or *"envelhecimento*" (aging). That expression is contained in a small rectangle linked by straight lines to other four "empty" rectangles, which compose a first-order "crown". Each of the four rectangles from the first crown is linked to other three rectangles, which form a second crown. Finally, second crown rectangles are connected to three third crown ones. This task makes it possible to clarify the meanings of word associations, as the participant first provides the four responses of the first crown, which are supposed to be linked to "aging", the stimulus expression. Then, at a second step, association responses are provided for the first and second crown responses, each response serving as a stimulus expression. Therefore, as the associative card provides the semantic context of participant responses, the researcher can interpret pertinent results with less ambiguity. The answer sheet for the associative card is reproduced in Appendix 1.

Semi-structured interview

Following the associative card, a semi-structured interview was carried out in order to obtain free discourse concerning aging, participants' understanding, experiences and beliefs about it, related social practices, and the actualization of the knowledge elements that had emerged on the card task in natural discourse. The interview was a conversation on two main topics: beliefs about aging and experiential and narrative aspects related to aging.

The broad guiding prompts related to the belief/experiential dimension were (in interview sequence): 1. What do you associate with the word "aging"?; 2. What is your way of viewing aging,

and what do you think about it?; 3. What does it mean to you: "to age"? Do you do anything about it?; 4. How old must a person be to be considered as an elderly person?; 5. According to you, what do other people at your age think about aging?; 5. In your opinion, what are the positive aspects of their thoughts about aging? And the negative ones?; and 6. What do people in general do about aging? Why do they do it?

Concerning the narrative aspects, the prompts were: 1. When did you feel old for the first time (for elderly people)? / When do you think you will feel old (for non-elders)?; 2. Was it / will it be a positive or negative change?; 3. Could you tell me what happened in that occasion? / Could you tell me what do you think will happen in that occasion?; and 4. Could you tell me what you thought and how you felt ib that occasion? / Could you tell me what you think you will think and how you think you will feel in that occasion? The original interview scripts in Italian and Portuguese are reproduced in the Appendix 2.

The interview script then continued with topics related to positive aging and interculture, in the context of a quali-quantitative study on aging and interculture (Contarello, Bonetto, Romaioli & Wachelke, 2008). Those parts of the interview will not be addressed here, as they were only introduced in the end of the data collection situation and are not directly related to the present investigation.

Procedure

The interviews were conducted individually. In Italy and Brazil, two specially trained native women undergraduates performed the interviewer roles[7]. Participants were informed that the research aimed at studying what people thought about aging.

In the beginning of the interview, participants provided the responses for the associative card, which were registered in the answering sheet by the researcher. After each response, participants were also asked if it had a positive, negative or neutral connotation. When either the associative card was fully completed or the participants said that they could not think of additional responses, the researcher asked them to point out the five responses that had the most important connections with aging, in their opinions.

Then the semi-structured interview took place. The interviewer followed the reported sequence of questions, but proceeded so as to stimulate the participant to explain the comments and develop the exposed points of view before moving on the script.

[7] The interviewers were Marinella Sansonetti (Italy) and Piera Hoffmann (Brazil).

Data analysis

The analysis of associative card data involved the count of evoked words and expressions, in order to identify those that had been more frequently mentioned. Also, frequencies were calculated for the words that had been pointed out as being more important, in order to have a first indication of cognem symbolic value. Finally, a qualitative analysis of the associated networks was made with the purpose of identifying basic common sense ideas related to aging on the part of participants and provide a list and definition of cognems to guide the following steps of research. Data from the interviews provided the examples of the use and employment of element content into discourse.

Results

Data analysis was directed to the identification of overall results, without intergroup (gender or age group) comparisons, as the heterogeneity of collected material and the small number of participants would make such comparisons troublesome. The sample included different age groups in order to cover the broader range possible of populations in this first research step, so as not to neglect any eventual segment.

Moreover, analyses were executed separately for the Italian and Brazilian contexts. Such a choice was made to respect the differences and possible interferences of each context, including the interviewer effect and different sociocultural settings. The investigation was conducted in two international settings as a means for monitoring the research processes in different contexts, so as to understand how far the processes can be identified, without a special regard of their content specificity. It is not among the purposes of this research effort to make comparisons between cultures, also because only two very limited settings within each cultural context were studied.

Most cited words and expressions regarding the associative task

Table 1 presents for each sample the words and expressions with frequencies 3 or higher. In the Italian sample, there were 375 word occurrences, with a total of 287 different word forms, which accounts for a diversity index of .76 (N/T, or number of word forms divided by the total of word occurrences, as described in Flament & Rouquette, 2003). Summed, their frequencies constitute 21.6% of corpus evocations. It can be seen from those results that key notions conveyed by those words are those of experience, death (death, end), a general decadence or decline (decay,

difficulties), or social exclusion (uselessness, loneliness, garbage) illness (illness, pain) and family life (family, kids).

Table 1. Words and expressions associated with the [aging] network with frequencies 3 or higher in the Italian and Brazilian samples (original Italian and Portuguese words in parentheses)

Words and expressions- Italy	Freq.	Words and expressions - Brazil	Freq.
Experience (*Esperienza*)	7	Family (*Família*)	7
Death (*Morte*)	6	Experience (*Experiência*)	6
End (*Fine*)	6	Health (*Saúde*)	6
Loneliness (*Solitudine*)	6	Wisdom (*Sabedoria*)	6
Decay (*Decadenza*)	4	Friends (*Amigos*)	5
Difficulties (*Difficoltà*)	4	Opportunity (*Oportunidade*)	5
Family (*Famiglia*)	4	Sadness (*Tristeza*)	5
Illness (*Malattia*)	4	Worry (*Preocupação*)	5
Non-acceptance (*Non-accettazione*)	4	Calmness (*Tranquilidade*)	4
Wrinkles (*Rughe*)	4	Happiness (*Felicidade*)	4
Fun (*Divertimento*)	3	Knowledge (*Conhecimento*)	4
Garbage (*Rifiuti*)	3	Losses (*Perdas*)	4
Kids (*Bambini*)	3	Peace (*Paz*)	4
Pain (*Dolore*)	3	Children (*Filhos*)	3
Thoughts (*Pensieri*)	3	Death (*Morte*)	3
Time (*Tempo*)	3	Harmony (*Harmonia*)	3
Uselessness (*Inutilità*)	3	Illness (*Doenças*)	3
Work (*Lavoro*)	3	Joy (*Alegria*)	3
		Loneliness (*Solidão*)	3
		Love (*Amor*)	3
		Memories (*Lembranças*)	3
		Outings (*Passeios*)	3
		Responsibility (*Responsabilidade*)	3
		Stability (*Estabilidade*)	3
		Studies (*Estudos*)	3
		Will strength (*Força de vontade*)	3
Total	73	Total	123

For the Brazilian sample there was a total of 393 occurrences and 253 words forms, which results in a diversity index of .64. Most of the basic concepts alluded to in the Italian sample are

also present here, such as wisdom and experience (wisdom, experience, knowledge), health and illness, social exclusion (loneliness), general decline (losses), family (family, children), as well as further aspects such as peace, calm and harmony, and activities such as going on outings and meeting friends.

Words and expressions indicated as very important regarding aging

As a further illustration of the symbolic value of basic ideas about aging, which can be considered as one of the indicators of social representation element centrality (Moliner, 1994a), counts for words equal or higher than 3 (accounting for 25% of the sample) were identified. In Italy, words mentioned 3 times as very important were death, experience and illness. Moreover, it is possible to aggregate words such as family (2 occurrences) and children (2), which are linked to family life; or even mind degeneration (2), physical degeneration (1) and loss of autonomy (1), which form a set related to general decline. In addition, words such as garbage (1), abandonment (1) and loneliness (1) indicate social exclusion, and the words wisdom (1) and knowledge (1) can also be aggregated to experience.

In Brazil, family, love and health had 4 occurrences each, while wisdom occurred 3 times as an important word. Words such as maturity (2 occurrences), knowledge (1) and patience (1) can be aggregated to wisdom, while illness (1) is also related to health issues.

Cognems (elements) related to the social representation on [aging]

Quantitative analysis with data from Italy and Brazil suggest that some notions seem to be reasonably shared by participants regularly, such as decline, wisdom, family, death, health problems, and social exclusion. A qualitative analysis of the built associative networks, as well as the analysis of the actualization of those ideas in discourse, allowed for a final list of seven social representation elements to guide further research. They were retained for the survey studies. Those cognems are presented with a short statement conveying their general meaning and illustrative examples of their use in interviews. All statements are presented as translated to English. The example excerpts can be found in their original languages in Appendix 3, in the order that they are presented in the text.

Wisdom: to age is to gain wisdom.

Examples (from the semi-structured interviews):

"There is that uncle of mine who is slowly aging a lot, he has worked so much, he has his imperfections, the imperfections are linked at the level of images to the wrinkles on his face, to the fact of being old, of being a little at a time fading with his illness, etc. He is getting closer to death but still anyhow he feels this motivation in transporting his experience, to the sons that are however not following his path, but also to whomever that now in this moment is willing to listen to him, to understand what he has done in his years" (Italian man, 24 years old)".

"The positive aspects are in the fact that if one got old or less it means that he or she has lived. It means that he or she has lived the time that has been given to him, and then what he has collected or not are his own affairs. He has had available time, the positive aspects are also the experience and the fact of being able to help other people, if he wishes, it depends. And that is all" (Italian man, 24 years old).

"We practically know from where we come and we know where we go. That is what gives you anxiety, the anxiety of death, the fear of death" (Italian woman, 67 years old).

"I don't like to age because if I were young I would be better, but I don't suffer either, because the experience that life has given me has also made me more mature, more calm and serene, that is what" (Italian woman, 83 years old).

"Because knowledge, according to me, is a strong point of age, overall beyond adult age, that is I link old age with, let's say, the end of a track, in which anyhow you have gained experiences and knowledge, and I experience knowledge, the experiences and knowing as the force, a force that helps to move forward, because it might stimulate further interests, it could be a force for the others" (Italian woman, 21 years old).

"I think that aging is well related with what I have said about gains and losses, you lose something that in youth was essential, related to beauty, to the body... Those things you lose, but at the same time you gain an experience so rich that… I am twenty-one years old, but, with the passing of time, this experience… It's not as if with the passing of years this experience takes the place of the things that you lost. What you had you won't have anymore, but you start getting more important things. Those are experience, knowledge, patience…" (Brazilian woman, 21 years old).

"I think that life experience makes of aging a noble thing. That is the first thing I see, I don't see that thing of you becoming weak, in the sense of health, etc. That, for me, is secondary" (Brazilian man, 21 years old).

Health problems: to age is to have to deal with health problems and illness

Examples:

"And now that I think about it, maybe I have a negative image because I have seen my grandmother at a certain age in which illness has come and has killed her personality, that is, it faded. Currently my grandmother is alive but for me she is dead, because she isn't there anymore, there is no more the grandmother that I had before, not because she's gotten old, but because she really does not reason anymore, she is sick, she does not reason anymore" (Italian man, 24 years old).

"Thoughts, I refer to all: illnesses, that which can be caused by that, it can lead to running from one place to the other, to hospitals, doctors, medicine, all those things" (Italian man, 51 years old).

"As you age, your body cannot take it, you are always sick of something, and then during that time that you stay in the hospital, those are the three things that you see more there. The doctors, the exams, the nurses" (Brazilian man, 22 years old).

"There are those who age with health, while others do not have it. So who ages with health, ages well. But who ages with illness, then it is sad, isn't it…" (Brazilian man, 67 years old).

"We lose health, with the passing of time we lose it. I mean, the machine gets tired" (Brazilian woman, 59 years old).

"Health because when the person gets old and does not have health, it is sad, isn't it? Then I think that aging with health is good. Getting old, sick and not having anything else to do is not worth it, is it? (...) What is more negative of all is illness. Sick person... Sick old person... "(Brazilian woman, 69 years old).

Death: to age is to get closer to death

"Because it is the anti chamber of death, the old man with apathy, that has become stupid, that gradually loses the perception of being, of existing. (…) Regarding death, emptiness, and end, you don't have the perception anymore, you don't have self-consciousness anymore. (…) You won't be able to look at your hands, you won't even have the consciousness of not being able of looking at your hands because you are not anymore. (…) It is not though much about aging as the terminal stage of one's own life. (…) Don't think that tomorrow at a certain point you age and you die because at that point, well, it'd be as good if you just stayed still" (Italian man, 24 years old).

"I would not like to age. Aging is the end. It means that from here there is no return. I think that it is the end of everything. There is another life, they say. But still no one has come back to tell us how it is. Then it is a doubt, right. It is a doubt" (Brazilian woman, 59 years old).

Family life: to age is to give more attention to the family

"Christmas lunches come to my mind, the organized parties in which the family gets together and realizes that it is part of a certain core, according to my experience those moments are not lived as formal ones, but in fact they are much felt, much experienced, authentically, then it is really a moment of warmth" (Italian woman, 24 years old).

"And what I said about union, about family, is because I find it essential, you get old, more and more you value people and you want, you get used to them being close by, you know, that is why I talked about friendship, family, love, those things, affect" (Brazilian woman, 21 years old).

"I am happy, because I have my children that respect me a lot, my grandchildren, and everything..." (Brazilian woman, 66 years old).

"I think that when a person ages, there is one thing that is very important for achieving happiness. Alone, that person is not happy. He or she can only be happy if the children are happy. Then I cannot say that I am happy if I see a son with a problem. For me that happiness is not complete. I will only have complete happiness if my family is all well" (Brazilian man, 57 years old).

"Free time to give attention to the children, to my life. To focus on my family. I want to keep my activities in family. To attend new courses. To study, because I study, I take Italian lessons. Traveling… And also to give more attention to the whole family. To my father, to my children…" (Brazilian woman, 47 years old).

New activities: to age is to take part in new activities

"I will start painting, one can discover things that he or she likes, that he or she could not do before, I hope it is not an image that I have in mind, too unrealistic. But I will work so that it is not unreal but real. Also with people from other age ranges or with grandchildren, young kids, or children. An elderly person can take part in activities such as volunteer work or can be inserted in mixed age groups, without necessarily being cast aside, I think it is possible and it would be an advantage both for him and for the others, yes because the elderly person that is alone among the elderly ages first, that is" (Italian woman, 24 years old).

"You stop working, and anyway you have an economic independence and you use it for what you can, you have more free time and you can use it in this way" (Italian woman, 44 years old).

"I am only thinking at all the things that I would like to do, once I won't have the commitments of work anymore. Certainly, then. For example I have already decided that I will want to travel, a lot, the fact of

retiring will not be like being relegated or being cast aside, but according to me it means much more time and I will be able to dedicate it to one of the things I like the most, that is, traveling" (Italian woman, 48 years old).

"I associate free time with the situation of retirement and I already have plans, concerning that free time, what I can do, when I no longer have my life focused on the professional part. My plans include rescuing something that I quit doing at youth. I used to play musical instruments, I stopped... I used to paint, I stopped… So those things I think about doing again" (Brazilian woman, 47 years old).

Social exclusion: to age is to be isolated and not considered by the others

"People feel useless in the context of work, productivity, socio economic, affects and passions can live well; one person who lives in contemporary society self-actualizes. Or society provides it that the person self-actualizes it in work, which means being productive, fulfilling tasks and when the person does not do it anymore it is not known not even where the person has to be put, the asylums and those forms of closing are linked to where to put a person that does not do anymore that which society had decided the person should live. But an elderly person also feels useless, according to me, because he or she realizes it, or because it comes given by the external context, yes, maybe it is more of an imposition of society. (…) Concerning all the discourse before, that old people are often alone, there are often uncomfortable news in the broadcasts about elderly people, dead for days and found alone and no one had realized it, because either they have no one anymore or no one who follows them goes and sees them, and the negative aspects are very strong, loneliness, abandonment, the lack of interests that the elderly person has, and on the other side the society that eliminates him or her because he does not work anymore, because it is tiring to be with an elderly person because that person bears problems, illness, suffering. Yes perhaps really because society does not want to see the suffering and illness that the old person is cast aside, but it is the natural process. (…) Then to behave well and have good relationships, I hope that when I will be elderly society does not consider me some kind of garbage to discard" (Italian woman, 24 years old).

"There are people who do not respect the old person. You know, who think that the person is old, that he or she must be cast aside" (Brazilian man, 67 years old).

"I think that for many people, the old person is useless, a burden. And I have the feeling that only when the elderly person is sick, many times they are put in asylums and shelters later, and sometimes they are forgotten there" (Brazilian man, 69 years old).

General decline: to age is to lose mental and physical capacities

"According to me, given that it is a process that you cannot avoid, the only way to age decently would be to do what you are doing now, gradually reducing it, because you cannot do it forever anyway, so at least in the end you will say: I went out to drink with my friends until the day before yesterday. Doing what you do everyday, realizing that now there are limits, gradually the limits increase, and then slowly (Italian man, 24 years old)".

"What does it mean to age? To lose enthusiasm, the happiness of living, to lose a little of everything, physical decay, autonomy, all those things put together, that is aging" (Italian woman, 67 years old).

"And that yes, I don't like it, I don't like it because aging makes me weaker to do certain things that once I was more energetic, I moved with ease, now it is hard, I feel pain sometimes in the morning" (Italian woman, 83 years old).

"I think there are many beautiful things that they say, like, ok you have expression wrinkles, you value other things, that is, it is true that thing. But partially, because, you go to a decrease anyway, you are not going up, you are going down" (Italian woman, 44 years old).

"And the disadvantages, I think that the loss of memories, the physique is no longer the same, your disposition is no longer the same. Let me see… The disadvantages are that you don't have the same thinking anymore, but, a force like this, the warmth of youth, I think" (Brazilian woman, 21 years old).

"And the issue of body limitations, when you grow up you no longer have the same, the same disposition to do certain things, to do sports, or you will be, you will be a more tired person…" (Brazilian man, 22 years old).

"Sometimes I think when I am laying down, I think about the time when I was a kid, I would run, and I would play, and today I cannot do it anymore... I get sad… So sad" (Brazilian man, 67 years old).

Time: aging is the passing of time

"As I said before, it seems to be, I did not realize that time had passed that fast, I found myself at my age… I do not accept that it is said that I am a part of the elderly people category, no" (Italian woman, 67 years old)

"And here, for the good or for the bad, there is, it is inevitable, time advances leaving signs in the physique, and then you must erase them, you must" (Italian woman, 48 years old).

"Age we know that it inhibits us with time..." (Brazilian man, 57 years old).

"To age is to live, in a certain way. Time… The passing of time, long-term life" (Brazilian woman, 23 years old)".

"Whether you like it or not, the passing of time goes, you must get old. Then that is it, one who does not get old, dies" (Brazilian man, 67 years old).

"Because it is like the fruit. You have the seed, the fruit gets mature, rots and falls. Then I see old age like that. That is how I see it. It is like a fruit, a tree that gives a wonderful and beautiful fruit, but that fruit shall have a time, it matures, if no one reaps it and eats it, it'll rot and fall" (Brazilian woman, 59 years old").

Having described the content of some cognems from the social representation on [aging], we shall proceed with empirical studies to characterize its structure for different groups.

Study 1-A

Method

Design

The study was a controlled survey with two explaining variables: age group (young and elderly people) and gender. There were a series of dependent variables sets: social implication by [aging], structural status of the elements of the social representation on [aging], affective loading associated with social representation elements and basic cognitive schemes valences.

Participants

The survey had 80 participants: 40 of them were young adults with ages ranging from 19 to 29 years old (M = 22.20 years, SD = 2.10 years), half of each gender; and the other 40 were mature

adults with ages between 60 to 75 years[8] (M = 64 years, SD = 4.03 years), reasonably balanced by gender (21 were women). Young adults were undergraduates enrolled in the University of Padua. Mature participants were a more diverse group formed by grandparents, relatives and acquaintances of students who lived in the Veneto region of Italy. While all young people came from a variety of undergraduate courses - 11 courses from law, social, biological and exact fields -, older participants differed in terms of their education: 6 of them had attended elementary school, 8 had reached up to basic education, 15 had completed high school and 11 had a university degree.

Instrument

A questionnaire in Italian was employed in data collection. On the opening page, participants were informed that they would provide their opinions about themes of social life. After that, they had to complete a standard basic cognitive schemes task (cf. Guimelli & Rouquette, 1992; Guimelli, 2003). Participants were asked to write down the first three words that came to their minds when thinking about "aging", justifying each one. Then they indicated, for each response, if a series of 28 logical operators connecting aging with the response were activated or not. These connectors are grouped according to the type of relationship that they express, forming three meta-schemes: Description (9 connectors), Praxis (12 connectors) and Attribution or Evaluation (7 connectors) (Rateau, 1995a; Rouquette & Rateau, 1998). The list of all connectors and schemes is given in Figure 1.

Further, participants completed a centrality questionnaire task (Moliner, 2001a) based on the questioning - '*mise-en-cause*' (MEC) - principle (Moliner, 1994a), about [aging]. Instructions were introduced by the following sentence: "According to you, can you say that one person is aging if…" and then there were a series of items contradicting, one by one, the cognems that had been identified and selected in the preliminary study As an example, for the <death> element, it was: "…he/she is not getting close to death?". The items on [aging] were short sentences related to the seven elements identified in the preliminary study: <death>, <wisdom> (he/she is not gaining

[8] The age range of 60 to 75 years might be considered as including different age groups of people; for instance, one might argue that someone who is 60 years old is not already an elder, as in countries like Italy, it is usually considered that the age of 65 marks the beginning of third age, and at the same time that a 65-year-old person is a 'young old', while someone at the age of 75 would be rather grouped with older participants. Yet, the study did not have the goal of providing results that can be generalized for a vast array of elderly people, or to focus on a limited range of elders. It aimed actually at investigating contrasting relationships with the representations on [aging] between young people and older ones. To avoid polemics on the attribution of the label elderly to the group of older participants or on the inclusion of elements from different demographic sets on the same sample, the group of participants with ages from 60 to 75 was named simple as 'mature' participants group, or 'older' participants group, which are employed in an interchangeable way.

wisdom), <new activities> (he/she is not taking part in new activities), <social exclusion> (he/she is not cast aside by other people), <general decline> (he/she is not losing physical and mental capacities), <family life> (he/she is not with his/her family) and <health problems> (he/she is not facing health problems or illnesses). All items were framed in negative form. For each item, participants had to select one of four options: "certainly yes" (absolute acceptance), "probably yes" (conditional acceptance), "probably no" (conditional rejection) and "certainly no" (absolute rejection).

Following the MEC items, there were a series of items evaluating the affective loading of each element. For each of the seven statements related to [aging] – now in their affirmative form and not being challenged through the questioning principle – participants had to indicate whether they were positive, negative, or neutral.

After the affective loading items, there were four items destined to assess social implication (Rouquette, 1988; Flament & Rouquette, 2003; Gurrieri, Wolter & Sorribas, 2007) with the [aging] object. Three dimensions were considered for analysis, as four-point scale items: personal identification (ranging from "it does not concern me more than it does another person" to "it concerns me personally"), perceived possibility of action (from "there is nothing I can do about it" to "it depends much on me") and social valuation. Two different types of items for social valuation were employed: a classical measure (from "it is not a particularly important theme" to "it is one of the most important themes"), and a measure on frequency of communication with others about the topic (from "I almost never talk about it" to "I often talk about it with others"). The classical measure is a direct assessment, and it might either favor a bias due to social desirability or be less useful due to a possible difficulty of participants relating it to other themes, which might lead them to consider "everything" as important. As a precaution, the second measure aims at identifying the stake value of the object, based on the assumption that people talk to others about relevant matters, and as such, the frequency or intensity of communication about a topic is a good indication of its social value.

Procedure

Participants were contacted individually. Undergraduates who were at the university library or study rooms were briefly informed about the questionnaire and invited to participate. In case of agreement, they completed the questionnaire on the spot, individually. The recruitment of mature participants occurred through the help of other undergraduates who declared that they had

grandparents, relatives or acquaintances at ages between 60 and 75. Those students were given clarifying instructions on the instrument, in order to be able to solve common doubts related to it. Further, they took the questionnaires to the mature people that they knew, who completed the questionnaires at home. Afterwards, questionnaires were returned to the researcher. The distribution of questionnaires was controlled by gender and age group in order to distribute a number of questionnaires as balanced as possible according to the planned research design.

Data analysis

The social implication items were dichotomized – the two options closer to each pole were merged into 'low' or 'high' for each implication dimension. Chi square tests were carried out to verify the existence of associations between age group and implication. In terms of representation structure, acceptance and rejection choices were also merged, so as to dichotomize response options. The proportion of reading grid rejection responses was calculated to assess the structural status of elements.

Log linear analyses - calculation of the effects and parameters of the saturated model - were conducted with a a Microsoft Excel-based program for the analysis of three-way tables (Sanchez-Peregrino, 2008) to verify the effects of design variables in rejection rates.

For the affective loading evaluations, negative, neutral and positive responses were converted into values -1, 0 and 1, and two-way ANOVAs were run to assess the effects of explaining variables on that set of dependent variables.

Finally, saturated log linear models were calculated for basic cognitive scheme activation in order to verify the effect of explaining variables. Scheme activation was the dichotomous dependent variable for all analyses, taking values "No" ("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). As before, only the saturated model was taken into account.

Hypotheses and expectations

The most important explaining variable role was expected to be performed by age group, due to the different stakes that young and elderly people face when it comes to old age and aging, as reported in the literature review. As for gender, Flament and Rouquette (2003)'s theoretical position interprets gender effects in social representation structures as field effects, as gender is a highly

relevant social identity marker that is cross-sectional to many topics, but is usually restricted to peripheral differences. If data supports that position, results related to gender should refer only to minor or peripheral differences in terms of representations structure, and there are not any reasons to expect significant effects for SCB valences whatsoever. This is valid for both the age group and cultural contexts investigations.

It was expected that people from the mature adults group would be globally more implied by [aging] than young participants. The most likely dimensions to reveal that effect would be personal identification and social valuation. The first one is linked to the fact that for older people aging is a process that affects their lives directly, and therefore they would feel closely linked to the topic. Due to that proximity, it seems plausible that they also increase the level of importance given to that issue and talk to others more often about it. If social valuation is considered as a frequency of intensity of communication with other people about the topic of interest, then it is also plausible that older people talk about aging more often than younger ones, as becoming old is a topic of their everyday lives. Yet, predictions regarding a perceived possibility of action could go both ways: either more aged people might change their way of thinking about aging due to new insight provided from their personal experience, or young and older people might share the perception of aging as a process within or outside their personal reach. Theoretically there is not a reason to choose preferably one alternative or the other, so there is no specific hypothesis on perceived possibility of action.

Centrality tests and affective loading assessments had an exploratory purpose, so no strong hypotheses were formulated for them. In terms of structure, according to the literature elements <death> and <wisdom> would be expected to have a central status. Still, the differences in terms of the stakes faced by both age groups leads us to formulate a very broad hypothesis stating that their knowledge about [aging] is different.

Hypothesis C-1: the central cores of the social representations of young and mature participants on [aging] will differ, i.e., there will not be an exact coincidence in terms of the central elements of both representations.

A few hypotheses guided the analysis of results on basic cognitive schemes activation.

Hypothesis SCB-1: mature participants will activate more schemes overall than younger adults, as aging is a theme that is more present in their everyday lives.

Hypothesis SCB-2: mature participants will have higher Praxis partial valences than young ones. Literature about the effect of practices on basic cognitive schemes activation has shown that people with more practical experience regarding an object activate more practical relations than

people without that kind of experience (Guimelli, 1994). Since elders have more practical experience linked to aging, practical connectors should be more activated for that group than for young people, as the latter supposedly have less access to functional aspects of the aging process.

A hypothesis on the activation of Evaluation connectors can be formulated, under the condition that Hypothesis 1 – global activation trend – is true. Literature shows that people without practical experience on a topic preferably activate normative elements, to the detriment of functional ones (Abric & Tafani, 1995). A result that is compatible with this tendency would be that of young people activating more attribution connectors than mature people, which leads to:

Hypothesis SCB-3: young participants will have higher Attribution partial valences than matures ones.

On the other hand, if mature participants have a globally higher activation rate for all schemes, then that tendency might not hold true. If the first hypothesis of global activation is confirmed, then there are no expectations that young people would activate more attribution connectors than older participants, but rather that:

Hypothesis SCB-4. Attribution connectors will consist of a larger proportion within the activation proportion of young participants, in comparison to Description and Praxis connectors, than for mature participants.

Results

Social implication

For the personal identification regarding [aging], only 14 (35%) of young participants reported high implication, whereas for older participants 27 did (67.5%) [Yates χ^2 (1, N = 80) = 7.205, p = .007, V = .33]. As expected, more mature participants found themselves identified with the aging topic than young ones were.

Concerning perceived possibility of action, 19 (47.5%) participants from each group were highly implied, and therefore no association was observed. The number of participants who were highly implied by the direct social valuation dimension was also exactly the same in each group: 16 (40%). The proportion of older participants who declared talking often to others about aging was higher than that of younger ones (50% vs. 32.5%, respectively), but the difference was non-significant [Yates χ^2 (1, N = 80) = 1.857, p = .173]. It is pertinent to point out that the association between the social valuation and frequency of communication measures was non significant: 32

(66.7%) of participants who did not value the topic of aging reported not talking about it with others often, while 17 (53.1%) of those who valued aging also communicated frequently about it [Yates χ^2 (1, N = 80) = 2.340, p = .126].

Structural status of representation elements

Saturated model log linear analyses were calculated to test the existence of any effect – main or interaction – on rejection proportions for each element, based on a three way table (age group x gender x acceptance or rejection responses). There were no significant global effects for most cognems: <death> [Y^2 (7, N = 80) = 10.352, p = .170], <wisdom> [Y^2 (7, N = 80) = 4.662, p = .701], <new activities> [Y^2 (7, N = 80) = 5.617, p = .585], <social exclusion> [Y^2 (7, N = 80) = 8.049, p = .328], and <health problems> [Y^2 (7, N = 80) = 10.422, p = .166]. There were significant global effects for <general decline> [Y^2 (7, N = 80) = 21.689, p = .003] and <family life> [Y^2 (7, N = 80) = 18.061, p = .012], and in both cases the only significant effect referred to a higher proportion of rejection responses than acceptance ones [<general decline >: Y^2 (1, N = 80) = 18.799, p = .001, z_{rej} = 4.05, p < .001; <family life>: Y^2 (1, N = 80) = 16.797, p = .001, z_{rej} = 3.88, p < .001]. These results indicate that there was no interference of gender or of an interaction involving gender on rejection rates. Therefore, analyses proceeded with the characterization of rejection rates for each age group, as that was the main variable of interest.

Following a possibility indicated by Moliner (1996), one-way chi-square tests were conducted to assess the rejection rates of questioning technique items. Items with rejection rates significantly higher than a 50% proportion were classified as being related to central elements. With N = 40, a frequency of 27 (67.5%) is the minimum value that yields a significant departure from equiprobability [Yates χ^2 (1) = 4.220, p = .040, w = .35]. It was then defined as the cut-off point to indicate the central status of a representational element. Separate results were obtained for each age group, so as to provide indications of young and mature participants' representation structures on [aging]. The results are presented in Table 2.

Table 2. Rejection rates, statistical test results and structural status of elements linked to the social representation on aging, per age group

	Young			Mature		
Element	Rej. / %	χ^2 (1)	Status	Rej. rate	χ^2 (1)	Status
General decline	28 / 70	6.40*	Central	31 / 77.5	12.10***	Central
Family	31 / 77.5	12.10***	Central	27 / 67.5	4.90*	Central
Social exclusion	25 / 62.5	2.50	Per.	27 / 67.5	4.90*	Central
Death	15 / 37.5	---	Per.	27 / 67.5	4.90*	Central
Wisdom	24 / 60	1.60	Per.	25 / 62.5	2.50	Per.
Health problems	23 / 57.5	.90	Per.	26 / 65	3.60	Per.
New activities	21 / 52.5	.10	Per.	13 / 32.5	---	Per.

* $p < .05$ ** $p < .01$ *** $p < .001$

For both groups, <general decline> and <family life> are central elements. <Social exclusion>, in the current study, only had a central status for the mature participants, yet the results suggest that the peripheral status of it for the young might be linked to the relatively small sample size of the analysis, and is likely to be subject to fluctuations in other data collections, as the difference in proportion when compared to the one of older participants is minimal. <Death>, on the other hand, presents a clear peripheral profile for the young, while for the older participants' sample it was also a central element; that is the most remarkable difference in the representation structures of the two groups. The remaining elements have a peripheral status in both groups. Results indicate that the central cores of the social representations of young and elderly participants on [aging] are different, thus confirming hypothesis C1.

Table 3 presents the results of the ANOVA main effect for the age group variable on affective evaluations of elements. There were no significant differences for any of the investigated cognems. <Social exclusion>, <general decline>, <death> and <health problems> are perceived negatively by both mature and young participants, while <family life>, <new activities and especially <wisdom> are positively evaluated.

Table 3. Means and standard deviations on affective evaluations of elements related to the social representation on aging, per age group.

	Young		Mature			
Element	Mean	*SD*	Mean	*SD*	*F*(1, 76)	*p*
General decline	-.78	.58	-.83	.45	.171	= .680
Family	.65	.62	.80	.30	1.272	= .263
Social exclusion	-.93	.27	-.75	.54	3.287	= .074
Death	-.60	.55	-.55	.64	.189	= .665
Wisdom	.90	.38	.88	.40	.074	= .786
Health problems	-.58	.75	-.55	.68	.056	= .814
New activities	.68	.62	.78	.53	.598	= .442

There were two other significant effects. There was a small main effect of Gender on the evaluation of <death>: female participants judged it more negatively than the male (*M* =-.73 and *SD* = .64 vs. *M* = -.41 and *SD* = .50, respectively) [$F(1, 76) = 6.253$, $p = .015$, $\eta^2_p = .08$)]. Additionally, there was a medium interaction effect on the evaluation of <health problems> [$F(1, 76) = 8.545$, $p = .005$, $\eta^2_p = .10$)]. While young men evaluated that cognem more negatively than the women (*M* =-.80 and *SD* = .52 vs. *M* = -.35 and *SD* = .88), the opposite pattern was observed for older participants (Men: *M* =-.32 and *SD* = .75 vs. Women: *M* = -.76 and *SD* = .54). Such effects were not expected, and no satisfactory theoretical explanation can be provided at this point. The remaining main and interaction effects were not significant[9].

Basic cognitive schemes

The analysis on overall SCB proportion activations had significant Gender, Activation, Gender x Age group and Activation x Age group effects (see Tables 4 and 5). The main effect related to Activation simply indicates that activation responses were less than non-activations ("No" and "?" responses). The main effect on Gender and the two-way interaction involving Gender and Age group are not particularly interesting, as they derive directly from research design, indicating that there was a slight difference in gender of older participants. Such effects will not be commented for the remaining analyses.

[9] <Death> – Interaction: $F(1, 76) = .358$, $p = .552$; <wisdom> – Gender: $F(1, 76) = .606$, $p = .439$, Interaction: $F(1, 76) = .125$, $p = .725$; <Social exclusion> – Gender: $F(1, 76) = .017$, $p = .898$, Interaction: $F(1, 76) = .150$, $p = .699$; <general decrease> – Gender: $F(1, 76) = .006$, $p = .940$, Interaction: $F(1, 76) = .254$, $p = .616$; <new activities> – Gender: $F(1, 76) = .007$, $p = .932$, Interaction: $F(1, 76) = .089$, $p = .767$; <family life> – Gender: $F(1, 76) = 1.565$, $p = .215$, Interaction: $F(1, 76) = .221$, $p = .639$; <health problems> – Gender: $F(1, 76) = 0$, $p = 1$.

Table 4. Response distributions for the global set of SCB items (Gender x Age group x Activation)

	Age group				
	Young		Mature		
Gender	No	Yes	No	Yes	Total
Male	1033	647	793	803	3276
Female	1006	674	930	834	3444
Total	2039	1321	1723	1637	6720
	3360		3360		

The effect that is relevant is the one related to the Activation x Age group interaction. It demonstrates that mature participants activated proportionally more SCB connectors – 48.5% - than did the young ones: 39.3% ($z = 7.81$, $p < .001$). This effect confirms hypothesis SCB-1 on global SCB cognem activation.

Table 5. Saturated log-linear model for the global set of SCB items

Effect	Y^2	*df*	*p*
Gender	4.200	1	= .040
Activation	96.424	1	< .001
Age group	.000	1	= 1.000
Gender x Activation	.154	1	= .695
Gender x Age group	4.203	1	= .040
Activation x Age group	60.397	1	< .001
Gen. x Act. x Age group	3.651	1	= .056
Global	169.222	7	< .001

Table 6 presents the contingency table for Description items only, while Table 7 shows the results relative to the saturated log-linear model. There are two important interaction effects. The Activation x Age group interaction indicates an association similar to the general trend, that is, older participants activating more Description connectors – 55.3% - than the young group – 30.1% ($z = 8.04$, $p < .001$) .

Table 6. Response distributions for the Description meta-scheme items (Gender x Age group x Activation).

	Age group				
	Young		Mature		
Gender	No	Yes	No	Yes	Total
Male	345	195	214	299	1053
Female	324	216	269	298	1107
Total	669	411	483	597	2160
	1080		1080		

The three-way interaction suggests that mature participants might activate proportionally more connectors – 58.3% - than mature women – 52.6%, but it was not a significant association. For the young, association was even weaker.

Table 7. Saturated log-linear model for the Description meta-scheme items

Effect	Y^2	*df*	*p*
Gender	1.350	1	= .245
Activation	9.607	1	= .002
Age group	.000	1	= 1.000
Gender x Activation	.050	1	= .823
Gender x Age group	1.351	1	= .245
Activation x Age group	64.682	1	< .001
Gen. x Act. x Age group	5.123	1	= .024
Global	82.300	7	< .001

The contingency table and log-linear model effects for the Praxis items are presented in Tables 8 and 9. Just as for Description connectors, there were an Activation x Age group and a three-way interaction effects. The two-way interaction indicates that again older participants activated proportionally more practical connectors than younger ones – 42.4% vs. 35.9%, respectively ($z = 3.64$), confirming hypothesis SCB-2.

Table 8. Response distributions for the Praxis meta-scheme items (Gender x Age group x Activation)

	Age group				
	Young		Mature		
Gender	No	Yes	No	Yes	Total
Male	472	248	374	310	1404
Female	451	269	455	301	1476
Total	923	517	829	611	2880
	1440		1440		

The interpretation of the three-way interaction is that for the young group, men and women participants did not differ in activation proportions, while for the mature ones, the activation proportion for men – 45.3% - was slightly higher than the one relative to women - 39.8% ($z = 2.30$; $p < .025$).

Table 9. Saturated log-linear model for the Praxis meta-scheme items

Effect	Y^2	*df*	*p*
Gender	1.80	1	= .179
Activation	136.278	1	< .001
Age group	.000	1	= 1.000
Gender x Activation	.383	1	= .536
Gender x Age group	1.801	1	= .179
Activation x Age group	12.888	1	< .001
Gen. x Act. x Age group	5.284	1	= .022
Global	158.557	7	< .001

Finally, for the Attribution meta-scheme items, there was no significant global effect, as shown in Tables 10 and 11. The global activation proportion was 48.9%.

Table 10. Response distributions for the Attribution meta-scheme items (Gender x Age group x Activation)

	Age group				
	Young		Mature		
Gender	No	Yes	No	Yes	Total
Male	216	204	205	194	819
Female	231	189	206	235	861
Total	447	393	411	429	1680
	840		840		

Hypothesis SCB-3 was not adequate to explain the obtained results. The analysis then proceeded to verify the internal importance of meta-scheme activations for each age-group.

Table 11. Saturated log-linear model for the Attribution meta-scheme items

Effect	Y^2	*df*	*p*
Gender	1.050	1	= .306
Activation	.772	1	= .379
Age group	.000	1	= 1.000
Gender x Activation	.071	1	= .790
Gender x Age group	1.051	1	= .305
Activation x Age group	3.088	1	= .079
Gen. x Act. x Age group	2.853	1	= .091
Global	8.863	7	= .263

The activation profiles in terms of meta-schemes for young and mature participants were then assessed through the calculation of a saturated log-linear analysis on a three way table with variables Age groups, Meta-scheme and Activation (see Table 12).

Table 12. Meta-scheme activation profiles of young and mature participants

Meta-scheme	Age group				Total
	Young		Mature		
	No	Yes	No	Yes	
Desc.	669	411	483	597	2160
Praxis	923	517	829	611	2880
Attrib.	447	393	411	429	1680
Total	2039	1321	1723	1637	6720
	3360		3360		

The important effect in this case is the second-order interaction (Table 13): young participants' Attribution activation rate had a higher importance in the overall profile (29.8%) in comparison to the importance it had in the profile of mature participants (26.2%) ($z = 2.77$, $p < .01$). In contrast, mature participants had a more important participation of descriptive connectors (34.5%) when compared to the profile of the young (31.1%) ($z = 4.43$, $p < .001$). The pattern that was predicted in hypothesis SCB-4 was supported: the higher activation trend of older participants was equaled by a more evaluative nature of the logical connectors activated by young people, a group that has a lower level of direct contact and identification with aging-related events.

Table 13. Saturated log-linear model for the Attribution meta-scheme items

Effect	Y^2	*df*	*p*
Meta-scheme	323.851	2	< .001
Activation	96.424	1	< .001
Age group	.000	1	1.000
Meta-sch. x Activation	50.233	2	< .001
Meta-sch. x Age group	.000	2	= 1.000
Activation x Age group	60.397	1	< .001
M.Sc. x Act. x Age gr.	20.261	2	< .001
Global	551.17	11	< .001

Study 1-B

Method

Design

The study was a controlled survey with two explaining variables: national cultural context (Italy-Padua and Brazil-Florianopolis) and gender. The dependent variables were the same from Study 1-A: social implication by [aging], structural status of the elements of the social representation on [aging], affective loading associated with social representation elements and basic cognitive schemes valences.

Cultural context is here understood as a restricted context in which participants have in common a block of characteristics that is due to being and living in Italy or Brazil. Those national cultures are considered as relatively separated realities and that is why those broad cultural blocks are operationalized as explaining variables. It must be noted that it is close to a cross-cultural perspective, in which it is assumed that participants from different cultural backgrounds offer comparable settings for the observation of variation in sociocognitive configurations.

Participants

The study had 80 participants, divided in two groups. The Italian sample was the young participant sample from Study 1-A, which has been included in the analyses of Study 1-B. The Brazilian sample had 40 participants, all of them young adults with ages ranging from 18 to 29 years old (M = 21.76 years, SD = 2.26 years), half of each gender. All participants from the

Brazilian sample were undergraduates enrolled in 19 courses from various fields of the Federal University of Santa Catarina comparable to the Italian ones.

Instrument

The same instrument employed in Study 1-A was used for Study 1-B, the only difference being its language: Portuguese instead of Italian.

Procedure

The same recruitment steps employed for the young sample of Study 1-A were adopted for Study 1-B. Participants were contacted individually in university environments and completed the questionnaire at that moment.

Data analysis

The same data analysis procedures from Study 1-A were followed in Study 1-B.

Hypotheses and expectations

The analyses on social implication have an exploratory nature, but it is likely that some differences are found, if cultural context differences are considerable. And eventually those differences might help explain the distinctions of the two settings.

Similarly to Study 1-A, it is expected that the major differences in terms of cultural contexts (in terms of world population aging, contact level of young and elderly people, the role of the elderly people in societies) are reflected in different social representation structures. The results on affective loadings also have an exploratory nature and there is no predicted direction for them.

Hypothesis C-2: the central cores of the social representations of Italian and Brazilian participants on [aging] will be different from each other.

In terms of SCB activation, two hypotheses can be advanced, on the understanding that Italian participants would have more experiences with elderly people, old age and the aging phenomenon in their countries, due to the configuration of the population pyramid of Italy, which makes the topic more salient. Then, it is likely that their social representations activate more relationships than the Brazilians'. Additionally, Italian participants should have a more practical

representation than Brazilians (although, as shown on the results of Study 1-A, their representations are more normative than practical). The activation of profile of Brazilians should also privilege attribution activations.

In a way that is also similar to Study 1-A, three hypotheses can be formulated:

Hypothesis SCB-5: Italian participants will activate more schemes overall than the Brazilian, as aging is a theme that is more present in their everyday lives.

Hypothesis SCB-6: Italian participants will have higher Praxis partial valences than Brazilian ones.

On the condition that hypothesis SCB-5 is true, we can expect that Brazilians, due to less experience with [aging], will have a representation with a more important participation of Attribution connectors than Italian participants, in a way that was similar to the comparison between young and mature participants from Study 1-A:

Hypothesis SCB-7. Attribution connectors will consist of a larger proportion within the activation proportion of Brazilian participants, in comparison to Description and Praxis connectors, than for Italian participants.

Results

Social implication

Most Brazilian participants reported a high perceived possibility of action regarding aging (75%), whereas less than half of Italian participants thought they had some influence on the matter (47.5%) [Yates χ^2 (1, N = 80) = 5.267, p = .022, V = .28]. The overall proportion of participants who were highly identified with aging was a minority of 38%. In addition, 35% of participants talked to other people about aging often and 47.5% considered it a very important issue. There were no significant differences in the Italian and Brazilian samples concerning personal identification [Yates χ^2 (1, N = 80) = .211, p = .646], frequency of communication with others [Yates χ^2 (1, N = 80) = .055, p = .815] and social valuation [Yates χ^2 (1, N = 80) = 1.2, p = .263].

Structural status of representation elements

Saturated model log linear analyses were calculated to verify the existence of any effect – main or interaction – on rejection proportions for each element, based on a three way table (age group x gender x acceptance or rejection responses). As observed in Study 1-A, there were no

significant global effects for most cognems: <death> [Y^2 (7, N = 80) = 11.704, p = .127], <wisdom> [Y^2 (7, N = 80) = 8.066, p = .327], <new activities> [Y^2 (7, N = 80) = 6.783, p = .452], <social exclusion> [Y^2 (7, N = 80) = 12.171, p = .095], and <health problems> [Y^2 (7, N = 80) = 10.074, p = .184]. Also as in the first study, there were significant global effects for <general decline>. [Y^2 (7, N = 80) = 20.003, p = .006] and <family life> [Y^2 (7, N = 80) = 15.576, p = .029], which accounted simply to a higher proportion of rejection responses rather than acceptance ones [<general decline>: Y^2 (1, N = 80) = 18.799, p = .001, z_{rej} = 4.07, p < .001; <family life>: Y^2 (1, N = 80) = 13.165, p = .001, z_{rej} = 3.50, p < .001]. The analyses then proceeded with the assessment of rejection rates per cultural context group, to characterize representation structure in terms of structural status.

As in Study 1-A, one-way chi-square testes were carried out to evaluate the structural status of elements, according to the same criterion (cut-off frequency: 67.5%). The results of the Italian sample (the same from the young sample of Study 1-A, Table 2) are presented alongside the results relative to the Brazilians, in Table 13.

Table 13. Rejection rates, statistical test results and structural status of elements linked to the social representation on aging, per cultural context group

	Italian			Brazilian		
Element	Rej. / %	χ^2 (1)	Status	Rej. rate	χ^2 (1)	Status
General decline	28 / 70	6.40*	Central	31 / 77.5	12.10***	Central
Family life	31 / 77.5	12.10***	Central	25 / 62.5	2.50	Per.
Social exclusion	25 / 62.5	2.50	Per.	29 / 72.5	7.22**	Central
Death	15 / 37.5	---	Per.	23 / 57.5	.62	Per.
Wisdom	24 / 60	1.60	Per.	27 / 67.5	4.22*	Central
Health problems	23 / 57.5	.90	Per.	28 / 70	6.40*	Central
New activities	21 / 52.5	.10	Per.	12 / 30	---	Per.

* p < .05 ** p < .01 *** p < .001

Compared with the Italians, who had a central core formed only by <general decline> and <family life>, the Brazilians had a core constituted by four elements: <general decline>, social exclusion>, <health problems> and <wisdom>. Results confirm the expected difference in representational structure predicted by hypothesis C2.

Table 14 presents the results of the ANOVA main effect for the cultural context group variable on affective evaluations of elements. There were no significant differences for any of the investigated cognems. Exactly like the previous study, <social exclusion>, <death>, <general

decline> and <health problems> are perceived negatively by both Italian and Brazilian participants, while <family life>, <new activities and <wisdom> are positively evaluated.

Table 14. Means and standard deviations on affective evaluations of elements related to the social representation on aging, per age group

	Italian		Brazilian			
Element	Mean	*SD*	Mean	*SD*	$F(1, 76)$	p
General decline	-.78	.58	-.88	.46	.734	= .394
Family life	.65	.62	.70	.56	.139	= .710
Social exclusion	-.93	.27	-.75	.59	2.937	= .091
Death	-.60	.55	-.35	.74	3.220	= .077
Wisdom	.90	.38	.95	.22	.521	= .473
Health problems	-.58	.75	-.75	.59	1.404	= .240
New activities	.68	.62	.70	.52	.040	= .841

There was only one significant effect on the ANOVAs, a medium main effect of Gender on the evaluation of <death>: as in Study 1-A, women view it as a more negative element than male ones (M =-.68 and SD = .52 vs. M = -.27 and SD = .72, respectively) [$F(1, 76) = 8.244$, $p = .005$, $\eta^2_p = .10$)]. All the other main and interaction effects were not statistically significant[10].

Basic cognitive schemes

The analysis on SCB total valences had a significant Activation main effect as well as an interaction involving Cultural context and Activation (see Tables 15 and 16). The Activation effect indicates that non-activations are more frequent than activation of relationships between [aging] and the responses.

[10] <Death> – Interaction: $F(1, 76) = 0$, $p = 1$; <wisdom> – Gender: $F(1, 76) = 0$, $p = 1$, Interaction: $F(1, 76) = 2.082$, $p = .153$; <Social exclusion> – Gender: $F(1, 76) = .539$, $p = .465$, Interaction: $F(1, 76) = 1.498$, $p = .225$; <general decline> – Gender: $F(1, 76) = .734$, $p = .394$, Interaction: $F(1, 76) = 1.652$, $p = .203$; <new activities> – Gender: $F(1, 76) = 3.268$, $p = .075$, Interaction: $F(1, 76) = 1.977$, $p = .164$; <family life> – Gender: $F(1, 76) = .557$, $p = .458$, Interaction: $F(1, 76) = 0$, $p = 1$; <health problems> – Gender: $F(1, 76) = 1.404$, $p = .240$, Interaction: $F(1, 76) = 3.468$, $p = .066$

Table 15. Response distributions for the global set of SCB items (Gender x Cultural context x Activation)

	Cultural context				
	Italian		Brazilian		
Gender	No	Yes	No	Yes	Total
Male	1033	647	1151	529	3360
Female	1006	674	1128	552	3360
Total	2039	1321	2279	1081	6720
	3360		3360		

The main interest in the analysis is the first-order interaction: it indicates that Italian participants do activate more connectors (39.3%) than Brazilians (32.2%), which is compatible with SCB-5: [aging] is a topic that is associated with a more complex network of relationships for the participants from the Italian context ($z = 6.10$; $p < .001$).

Table 16. Saturated log-linear model for the global set of SCB items

Effect	Y^2	*df*	*p*
Gender	.000	1	= 1.000
Activation	553.941	1	< .001
Cultural context	.000	1	= 1.000
Gender x Activation	1.612	1	= .203
Gender x Cult. cont.	.000	1	= 1.000
Activation x Cult. cont.	37.367	1	< .001
Gen. x Act. x Cult. cont.	.011	1	= .916
Global	592.939	7	< .001

Table 17 contains the results for Description connectors and Table 18 presents the calculated effect from log-linear analysis.

Table 17. Response distributions for the Description meta-scheme items (Gender x Cultural context x Activation)

	Cultural context				
	Italian		Brazilian		
Gender	No	Yes	No	Yes	Total
Male	345	195	384	156	1080
Female	324	216	363	177	1080
Total	669	411	747	333	2160
	1080		1080		

There is only one relevant significant effect: the first order interaction involving Cultural context and Activation. Italian participants activate more Description connectors (38.1%) than do the Brazilians (30.8%) ($z = 3.53$; $p < .001$).

Table 18. Saturated log-linear model for the Description meta-scheme items

Effect	Y^2	*df*	*p*
Gender	.000	1	= 1.000
Activation	212.577	1	< .001
Cultural context	.000	1	= 1.000
Gender x Activation	3.618	1	= .057
Gender x Cult. cont.	.000	1	= 1.000
Activation x Cult. cont.	12.491	1	< .001
Gen. x Act. x Cult. cont.	.030	1	= .862
Global	228.717	7	< .001

The contingency table and log-linear model effects for Praxis connectors are contained in Tables 19 and 20.

Table 19. Response distributions for the Praxis meta-scheme items (Gender x Cultural context x Activation)

	Cultural context				
	Italian		Brazilian		
Gender	No	Yes	No	Yes	Total
Male	472	248	527	193	1440
Female	451	269	516	204	1440
Total	923	517	1043	397	2880
	1440		1440		

The same pattern observed for the general and Description valences is observed there: the only pertinent effect is the first order interaction between Cultural context and activation. Results are compatible with hypothesis SCB-6: the Italians indicate more Praxis relationships involving aging – 35.9% - than the Brazilians –27.6% ($z = 4.79$; $p < .001$).

Table 20. Saturated log-linear model for the Praxis meta-scheme items

Effect	Y^2	*df*	*p*
Gender	.000	1	= 1.000
Activation	393.309	1	> .001
Cultural context	.000	1	= 1.000
Gender x Activation	1.642	1	= .200
Gender x Cult. cont.	.000	1	= 1.000
Activation x Cult. cont.	23.130	1	< .001
Gen. x Act. x Cult. cont.	.110	1	= .740
Global	418.191	7	< .001

Finally, the connectors of the Attribution meta-scheme followed the same pattern found in this study, with a significant interaction of Cultural context and Activation. Results are presented in Tables 21 and 22.

Table 20. Response distributions for the Attribution meta-scheme items (Gender x Cultural context x Activation)

	Cultural context				
	Italian		Brazilian		
Gender	No	Yes	No	Yes	Total
Male	216	204	240	180	840
Female	231	189	249	171	840
Total	447	393	489	351	1680
	840		840		

Again, Italian participants had a higher partial valence related to Attribution – 46.8% - than did the Brazilian – 41.8%. However, that difference was smaller than the ones relative to the other valences ($z = 2.06$; $p < .025$).

Table 22. Saturated log-linear model for the Attribution meta-scheme items

Effect	Y^2	*df*	*p*
Gender	.000	1	= 1.000
Activation	21.990	1	< .001
Cultural context	.000	1	= 1.000
Gender x Activation	1.390	1	= .238
Gender x Cult. cont.	.000	1	= 1.000
Activation x Cult. cont.	4.258	1	= .039
Gen. x Act. x Cult. cont.	.083	1	= .774
Global	27.721	7	< .001

As in Study 1-A, a three way table with variables Meta-scheme, Cultural context and Activation was constructed to assess differences in the participation of different meta-schemes in the overall activation profiles of participants. The data are presented in Table 23.

Table 23. Meta-scheme activation profiles of Italian and Brazilian participants

Meta-scheme	Cultural context				Total
	Italian		Brazilian		
	No	Yes	No	Yes	
Desc.	669	411	747	333	2160
Praxis	923	517	1043	397	2880
Attrib.	447	393	489	351	1680
Total	2039	1321	2279	1081	6720
	3360		3360		

Hypothesis SCB-7 would be supported if a second order interaction was significant, and if results indicated a higher participation of Attribution connectors in the Brazilian profile than in the Italian one. That was not the case; as Table 24 indicates, the second order interaction was non-significant. Hypothesis SCB-7 was not supported by our results.

Table 24. Saturated log-linear model for the Attribution meta-scheme items

Effect	Y^2	*df*	*p*
Meta-scheme	323.851	2	< .001
Activation	553.941	1	< .001
Cult. cont.	.000	1	= 1.000
Meta-sch. x Activation	73.936	2	< .001
Meta-sch. x Cult. cont.	.000	2	= 1.000
Activation x Cult. cont.	37.367	1	< .001
M.Sc. x Act. x Cult. con.	2.512	2	= .285
Global	991.607	11	< .001

Discussion

The overall picture that emerges from results allows for a schematic understanding of the social representation on [aging] and how it is associated with age group, cultural context and gender influence. We will deal with results from the two studies separately and then comment on common aspects.

Concerning age group differences (Study 1-A), hypotheses predicting structural status differences, higher valences (total and praxis) for mature people and a higher participation of attribution connectors were confirmed. Results indicate that young Italian people represent [aging] as a process marked by general decline and a shift to strengthening family life. The proximity of death, the acquisition of wisdom, the emergence of illness and health problems, as well as taking part in new activities, are all conditional possibilities related to it, but do not define it. In contrast, other than <general decline> and <family life>, two elements play a central role for mature participants: <death> and <social exclusion>. A possible interpretation of that difference is based on the perceptions of common experiences of older people, such as being cast aside by others, experiencing the deaths of parents and relatives and realizing that their own death is getting closer, as the perspective of future gradually decreases. These new components of the representation are probably linked to a higher identification of older people with the aging process, as it does not refer to a far-away reality, but can rather be felt in everyday life; personal identification was the only implication dimension in which mature participants scored higher than young ones. The remaining elements still maintain their conditional status, indicating possible but not essential aspects that come around in the lives of people who are getting older. In terms of basic cognitive scheme activation, mature participants do activate more relationships for [aging] than young ones, and the latter tend to give a higher participation than the former to attribution relationships in their total valence. The pattern of more people who have higher practical experience regarding an object – as is the case with elderly people and [aging] – is supported by the literature (Guimelli, 1994), as are the results that indicate that people without practical experience – the young – emphasize attribution relationships (Abric & Tafani, 1995). Also, if the personal identification dimension of social implication is taken as evidence of structural differences between age groups, the study contributes to the understanding of the role of social implication in representation relationship activation, in the vein of studies such as Gruev-Vintila and Rouquette's (2007). Overall, concerning age group differences, the results point out to the understanding that the difference in stakes related to [aging] that young and elderly people face corresponds to representational differences in terms of structure.

The specificity of Study 1-B is the identification of the importance of cultural contexts to characterize social representation structures. Hypotheses on structural differences and higher valences by Italian participants were confirmed. Compared to the Italian young participants, the Brazilian ones had a central core formed by four elements: <general decline>, <social exclusion>, <wisdom> and <health problems>. The differences are in the absence of a strong family component - an element central for Italians -, and in the view that aging is strongly connected to gains in

wisdom and experience, but also to the elderly people being cast aside from social life. Interestingly, in a study on intercultural differences between Brazil and Italy which shared the same sample of our preliminary study (Contarello, Bonetto, Romaioli & Wachelke, 2008), Brazilian participants who were asked about what they thought aging in Italy was like mentioned that the Italians had a culture strongly marked by family life and that elderly people would be better integrated in that means. Accurate or not, the case with our results is that the Italian students do understand the aging process as closely linked to living in the family, whereas the Brazilian think it is just a possibility. In terms of other elements, the centrality of <social exclusion> and <health problems> in the Brazilian sample might be associated with the understanding that social conditions in Brazil are in general more precarious than in first-world countries – interpretation that is also supported by what the participants from the study of Contarello and collaborators (2008) express concerning Italy and Europe. As for <wisdom>, the sample of young Brazilians was the only of the three groups in our study that confirmed it in the core. While it does seem to be a relatively important element for all of them, its centrality is not a common pattern, and therefore it justifies the conduction of structural investigations such as this one, aiming at confirming the status of representation elements rather than just identifying salient ones.

In terms of basic cognitive schemes activation, the Italian participants had higher total and partial valences. It does seem then that the supposed higher salience of the aging process in Italy is a plausible way to explain those results. Yet, it is also pertinent to point out that in both groups the distribution of connectors across meta-schemes was similar; the same activation pattern holds true for both cultural contexts, and then it seems that there is an overall common activation profile for young people for the [aging] object. The higher salience of that object is associated with more associations in the representations, proportionally distributed across relationship types.

It is pertinent to remember, though, that cultures are dynamic; as Lehr (2002) pointed out, the aging of populations is likely to affect the relationship that people have with that topic and associated phenomena. The results from Study 1-B can only reflect a specific time and geographic frame, and as the proportion of elderly people in developing and emerging countries increase – as is the case of Brazil – corresponding representations are also likely to change, as they reflect environmental conditions (Flament, 1994c; Flament & Rouquette, 2003). Still, some cultural specificity is likely to be stable; perhaps a hint on that direction is the higher perceived possibility of action regarding [aging] on the part of Brazilian students, compared to the Italian ones. Interpretation there would be tentative at best, as it is difficult to find clear factors to explain

cultural context differences, especially when they were not predicted, but it might be a cue for future research.

Another additional clarification is to be done concerning the nature of the research in Study 1-B. It has a clear multicultural perspective, based on the assumption that cultures are relatively isolated "blocks" and their comparison can be useful to understand the nature of cultural variables in sociopsychological processes. We are considering that Brazilian and Italian people, in general, have little contact with people from the other country at an intergroup level, and that those cultures maintain a reasonable social distance. In the case of contexts in which people from different cultures get into intense social exchange, an intercultural approach (Mantovani, 2004) might be preferred. Also, it is possible to undertake research efforts considering both age groups and the Brazilian and Italian contexts within an intercultural perspective (cf. Contarello et al., 2008).

As for the aspects that were common to both studies here reported, it is important to stress that gender played no role in defining the structure of the social representations on [aging]. This result is compatible with the understanding that gender differences usually reflect what Flament and Rouquette (2003) call field effects: the modulation of ideological oppositions (such as men – women) in representational structures is restricted to peripheral differences. In terms of affective loadings of elements, results were remarkably similar across all groups: the evaluations given to elements are almost consensual: cognems are either very negative or very positive, and no neutral elements were observed. Those results strengthen the trends identified in literature that [aging] is conceived in terms of gains and losses. A result for which we have no current interpretation, however, and that was consistent in both studies, was a more negative understanding of <death> on the part of women, when compared to men.

Finally, two methodological contributions from the studies are to be emphasized. The first one is the adoption of log-linear analysis in structural social representations research. The literature has usually employed bivariate chi-square tests to measure the associations of nominal-level variables, both to evaluate structural status and basic cognitive scheme activation. Log-linear analysis and modeling have the advantage of measuring the statistical association of three or more variables from contingency tables, which makes it possible to assess the interactions in factorial survey, experimental and quasi-experimental designs with more precision. To our knowledge, this is the first structural research on social thinking that makes use of that statistical technique.

A second point that is worth mentioning is the analysis of the participation of partial valences within the total valence activation profile. As we observed in our Study 1-A results, it disclosed a trend for attribution activation among young participants that would go unnoticed if we

had restricted the analysis to the comparison of partial valences across age groups. The participation of meta-scheme connectors within the whole activation profile is a potential carrier or pertinent information and might be relevant also for other research projects.

In conclusion, results are mostly internally coherent. The study provided a structural characterization of the representation on [aging] that contributed to the understanding of the effects of age group belonging and cultural contexts as salient social segmentation that is corresponded by considerable differences in representational structure. In addition, affective meanings given to the representation seem to be highly consensual, while gender plays a peripheral modulating role. The study sets the foundations for further basic and applied research in the investigated contexts, even if it is desirable to replicate results before proceeding, as the current investigation did not have large samples so as to authorize generalization of results.

As for the broader research from this thesis, this characterization makes it possible to go forward by passing to a more thorough exploration of a representation system in which [aging] is taken as a reference point. Part III is directed at exploring single structures of other representations that might be related to [aging] and at understanding their structural connections with that social representation.

Part III: Structural characterization of the representational system

Chapter 5: Structural characterization of the social representations from the system

In Chapter 4 we have justified our understanding that [aging] is a social representation object, and also characterized the structure of the representation associated with it. But is it a suitable object to study the topic of the present research program, i.e. structural relations among social representations?

Our answer to that question is also positive, based on the reviewed results on representation structure and the results from Studies 1-A and 1-B (see Chapter 4). Many of the elements commonly associated with [aging] are likely to be connected to broader notions that could as well be relevant social objects for samples of young or elderly people. <Illness> and <decline>, for example, are probably connected to social objects such as [health] or [body].<Family life> is linked to [family], while <retirement> or <loss of productivity> refer to the theme of [work]. The <death> element and the [death] object are obviously intimately related. Finally, the dimension that perhaps best presents the course of aging is that of [time], and since it is a broad polymorph notion, it might as well constitute a social representation object.

If it is hypothesized that [aging] maintains structural relationships with at least some of those likely social representations, then it does make sense to conceive it within a representational system, a set of representations that are interconnected and mutually dependent on each other, forming a higher-order structure. If that is the case, then the representational system of [aging] probably allows for the study of associations between representations, and from a structural perspective some of the association patterns are probably generalizable to other systems.

In order to have a first approximate characterization of the representational system constructed around the social representation on [aging], an exploratory survey has been conducted to characterize the shared knowledge about seven social objects that might constitute the representational system: [aging] itself – thus providing an opportunity for exploring different data and better evaluate the results from Studies 1-A and 1-B, - [health], [family], [body], [work], [time] and [death].

It is important to justify their condition as social objects, as we have done for [aging] in Chapter 4. We will be brief, though, and point out that most of them have already been productively studied as social representation objects, as evidenced by the existence of empirical studies in the literature. The social representation on [work] has been the topic of various studies aligned with a structural perspective (Flament, 1994d,; Milland, 2002; Márquez, 2005; Oliveira, Fischer, Amaral, Teixeira & Sá, 2005). The remaining social representations, i.e. [health] (Herzlick, 1969; Flick,

2000), [body] (Jodelet, 1984; Goetz, Camargo, Bertoldo & Justo, 2008), [time] (Ramos, 1992) and [family] (Costa e Silva & Cunha, 2005) have been the focus of other social representations approaches.

The meanings of elements from the social representation on [aging] provide hints of possible links with the other representations. The social representation on [health] might be related to health-related elements of [aging], such as <health problems – illness> or <general decline>. [Body] is also related to <general decline>, as the decrease of capacities and constitution is strongly physical. Since <family life> is an important cognem of [aging], it is closely connected with the understanding that people have of families, and therefore the social representation on [family] is key. The passing from a working situation to retirement or incapacity of conducting productive activities evidences the importance of taking into account the social representation on [work] in the system. [Time] is the main dimension that organizes the understanding and "diagnosis" of the aging process. [Death] is the event through which life ends, and since old age is often the phase that precedes it, probably both representations are intimately connected. Study 2, to be presented next, was conducted with a population of young Italian undergraduates – as most of the remaining ones in the thesis - for three reasons: the possibility of referring to the baseline characterization provided in Chapter 4, the relative ease of access to a fairly high number of participants for the various studies, and the familiarity that the population has with questionnaire tasks and abstract reasoning. In other populations, complications with some of the proposed tasks might invalidate the studies.

Study 2

Method

Design

The study was an exploratory survey that aimed at characterizing the representational system containing the social representation on aging at two levels: within and inter-representation. First, at the inter-representational level, the study aimed at assessing the overlapping of vocabulary employed to characterize the objects and the perceived similarities among objects, in order to select a few of those social representations for further research related to the thesis. A second aim involved the characterization of social representations at the within-representation level in terms of vocabulary distribution associated with the representations, structural status and affective loadings

of elements, so as to infer possible relations between those representations and the social representation on [aging].

Participants

In Studies 1-A and 1-B a more general sample of university students enrolled in different courses was employed because the goal was to characterize the representation on [aging] taking into account a group of young people while avoiding possible bias from specific courses. For the remaining studies of the thesis, the sample was composed by students from Psychology courses or similar, so as to keep the interference from university affiliations constant and have comparable populations in those studies.

A total of 151 Psychology undergraduates from the University of Padua, Italy composed the sample of Study 2. The majority of them - 110 (72.8%) - were women. Their age ranged from 19 to 28 years old, with a mean of 21.43 years (SD = 1.85) and a median of 21 years. A total of 73 participants (48.3%) were enrolled on the second year of the course, followed by 35 (23.2%) from the first year, 30 (19.9%) from the third one, 11 (7.3%) from the fourth year and 2 (1.4%) enrolled on the fifth and final year.

Instrument

A questionnaire in Italian language composed mainly by evocation tasks was employed in data collection. On the opening page, participants were informed that they would provide their opinions about themes of social life. After that, they had to fill in seven pages containing detailed evocation tasks, each with a stimulus word that supposedly labels one social representation related to [aging]: [aging] (itself), [time], [death], [health], [body], [work] and [family].There were 12 versions of the questionnaire, each with different presentation orders, randomly generated, so as to minimize any effect due to exposure to a label prior to answering questions regarding another one.

For each stimulus word, participants were asked to write down three words or expressions that came to their minds when thinking about the representation label. Each response was identified by a code (for example, Response B1 or Response B2), and below the association task there was one item destined to assess the affective load of the response. The participant was faced with three options, and it should be indicated whether the response was negative, neutral, or positive.

The final page of the instrument contained a task in which participants estimated the distances between all stimulus words presented before on a four-point scale from “far” to “close”. Social object labels were evaluated in pairs.

Finally, there were demographic items to describe the sample. Items included age, enrollment year and gender information.

Procedure

Questionnaires were administered in university classrooms by the researcher. The twelve versions that contained different presentation orders of stimulus terms were shuffled, so as to assign them randomly to participants. Participants who were 30 years or older were later excluded from the sample, as 29 years old was set as the limit for the young people category.

Data analysis

The analysis dealt with two structural levels of social representations: the structure of each representation in terms of cognems (within-representation level), and the structural relationships among representations (inter-representation level).

A first descriptive level was conducted at the within-representation level, but with the aim of evaluating each representation corpus in comparison with the others. It involved the calculation of lexical distributions for each stimulus word associated corpus. A series of five indexes were calculated. The diversity index is the division of word types by word occurrences; the lower it is, the more likely a corpus refers to shared knowledge, as few word forms (types) are responsible for many occurrences. Furthermore, there were calculations for rarity in the distribution, through a division of *hapax* (single occurrence) words by the total number of types. Finally, the polarity and neutrality indexes proposed by De Rosa (1995) were calculated in order to evaluate the affective profiles of the corpora associated with the stimulus words. For each social object, the polarity index was calculated through summing positive and negative occurrences and dividing the total by total word occurrences. The result could range from -1 (completely negative) to +1 (completely positive), with results close to 0 indicating a more neutral polarity, either by the prevalence of neutral words or by a balance of positive and negative words. The neutrality index is obtained by subtracting the sum of positive and negative occurrences from the total of neutral occurrences, and dividing the result by the total number of occurrences. It can also range from -1 (no neutral words)

to +1 (all words are neutral). A 0 result indicates that there is an equal number of affectively loaded and neutral words.

Concerning the inter-representation level of analysis, two procedures were carried out. The first one consisted of the calculation of the community index (Wolter, 2008), a measure of the proportion of common types in two corpora. The second one consisted in the construction of a similarity matrix from the rated distances of social object labels contained in the last page of the instrument. Each response linking two objects was recoded from 0 to 3 and the mean profiles for each item were calculated and divided by three, providing a result from 0 to 1. A similarity maximum tree was then drawn from that departure matrix. A similarity maximum tree is a graph with vertex and edges connecting all objects with a single path between any two vertexes on the graph (Degenne & Vergès, 1973).

Then prototypical analysis (Vergès, 1992) was conducted for some objects, at the within-representation level. Prototypical analysis consists on the calculation of word ranks and frequencies, and a segmentation of both dimensions based on high or low values. The same construction principles were respected for all prototypical analysis tables. Only words with frequencies 5 or higher were included on the tables. The median rank, 2, was employed as a cut-off point between low-rank words (those that were mentioned earlier in discourse, with a rank lower than 2) and high-rank ones (with average rank 2 or higher). As for the frequency cut-off point, it was equivalent to the frequency above which 30% of word occurrences was included, with a tolerance for higher proportions as long as a minimum of 30% of word occurrences was included on the upper zone.

The quadrants from prototypical analysis were organized according to the frequency and mean evocation rank criteria, but three supplementary indexes were presented in the tables. The first one was the proportion of rank 1 responses for each word. Having in mind that there is evidence that points out that considering the relationship with word rank and element centrality in social representations might not be always accurate (Wachelke, 2008), the proportion or rank 1 occurrences for each word was also calculated. The cut-off point to decide whether a word has a high or low proportion on this index was determined through a median split of the proportions of words with frequencies higher than 5.

The grouping of similar words for prototypical analysis was only done for words with the same root and grammar class. No aggregation was done based in meaning, so as to avoid possible biases from content procedures (cf. Flament & Rouquette, 2003).

For the evaluation of the affective loadings of each element, the polarity and neutrality indexes proposed by De Rosa (1995) were adapted. They were calculated for each element, rather than at the representational level, and included in prototypical analyses tables.

The similarity analysis was carried out through the software Similitude (Vergès, Junique, Barbry, Scano & Junique, 2002). The other analyses were processed on Evocation (Vergès, Scano & Junique, 2003), Microsoft Excel and SPSS software.

Results

Evocation distribution analysis

As a first approximation of representation structures, the diversity, rarity and polarity and neutrality indexes were calculated for each corpus. It can be observed in Table 25 that the objects with the lowest diversity indexes are [family], [death] and [health], which is a first sign of existence of a social representation for those stimulus words. Concerning rarity, [family] is the stimulus word which generates less hapax (single occurrence) words (.53), whereas the values from the other corpora range between .63 and .74.

In terms of affective loadings, [death] and [aging] appear to have an overall negative connotation, whereas [family] is the most positive corpus. [Time] and [body] are the corpora closest to a balanced evaluation, and the remaining objects have a positive evaluation. Finally, the neutrality index provides evidence that [time] and [body] are objects with similar proportions of affective and neutral evaluations, whereas the remaining objects tend to be affectively charged.

Table 25. Diversity, rarity, polarity and neutrality indexes per social objects corpora

Indexes	Aging	Family	Body	Work	Death	Health	Time
Diversity	.37	.29	.45	.41	.35	.35	.42
Rarity	.65	.53	.64	.70	.66	.63	.65
Polarity	-.21	.78	.13	.31	-.49	.41	.04
Neutrality	-.41	-.67	-.18	-.46	-.44	-.53	-.05

A first preliminary view of the representational space formed by the representations on the investigated objects indicates that [family], [health] and [death] have the most consensual vocabulary distributions, while [body], [work] and [time] have the most scattered ones. As for the affective profiles, [aging] and [death] are located on the negative pole, and [family] is the most

positively evaluated objects; still, most objects have positive evaluations. [Time] is the only object with a clear neutral connotation.

Inter-representational level

Table 26 presents the community indexes between corpora pairs, in order to characterize the degree with which the vocabulary is shared. Overall, the community indexes involving social objects corpora are small. Still, some slightly higher values indicate some pertinent vocabulary overlaps. [Body] and [health], [aging] and [death], and [aging] and [time] are the pairs with higher intersections in word forms. But still those values are relatively low and the emerging general pattern is that of fairly independent vocabularies employed in the characterization of the studied representations. The degree with which each vocabulary is shared (represented by the community index mean for each object) was also very similar, with only [body] having a slightly smaller shared proportion of corpus types.

Table 26. Lexical community matrix for social objects corpora

	Body	Family	Aging	Work	Death	Health	Time
Body	---						
Family	.05	---					
Aging	.04	.07	---				
Work	.04	.08	.06	---			
Death	.02	.06	.11	.04	---		
Health	.10	.06	.07	.07	.03	---	
Time	.04	.04	.09	.07	.06	.06	---
Mean	.04	.06	.08	.06	.06	.07	.06

Concerning the data involving direct paired distances, the similarity structure for the rated distances among social objects has [aging] as the most connected vertex on the graph, directly linked to three other social objects: [time], [death] and [body], as shown in Figure 3. As commented before, the value of each edge is a mean that might range from 0 to 1 (maximum perceived proximity) . This is coherent with the fact that the representation system comprising the seven social objects was conceived with [aging] as a reference point, and thus provides some evidence of the pertinence of chosen social objects for the effort. The pattern of data clearly shows that, according to participants, it is a central vertex in terms of connectivity. The graph also shows that the relationship between [body] and [aging] is strong, which brings [health] also reasonably closer

to [aging] as [body] intermediates their relationship. The full similarity matrix is given in Appendix 4.

Clique emergence results (see Appendix 5) indicate that [aging], [body] and [death] form a clique (subgraph in which all elements are connected through all possible edges) with similarity strength .84. At .81, [aging], [body] and [health] form another clique. Those two patterns indicate that these sets of notions are connected at reasonably high relationship rates. The relationship between [aging] and [work] is much weaker, as those two vertexes are only together at a clique at .40 strength. [Family] only joins a clique with [aging] at .39 level. The direct relationships between [aging] and [family] and [work] are the weakest, in comparison with the relationships between [aging] and other objects.

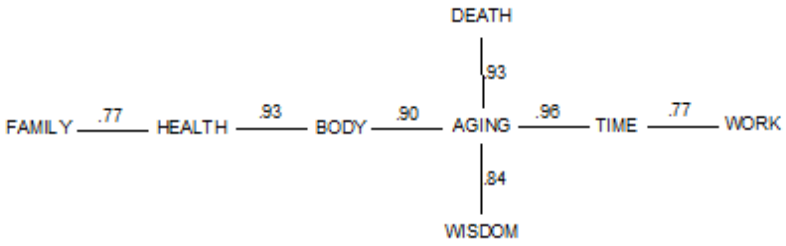

Figure 3. Maximum similarity tree from direct rated distances among the social objects

After the results of prototypical analysis, we decided to proceed with the prototypical analysis of four objects. We chose to work with [time], [death], [health] and [family]. [Time] and [death] were chosen due to their highest proximity with [aging]. We chose [health] rather than [body] due to the fact that it is a more abstract and general class and probably includes many of the relevant aspects of [body], as the edge that connects them is high. In addition, as shown in Appendix 4, the perceived distance between [aging] and [health] is fairly high, at .81. Moreover, [health] is probably more directly related than [body] to some of the elements of [aging] that are of our interest: <general decline>, <health problems> and <death>.

In contrast, [family] gives an interesting comparison reference, as it is a social object that is perceived as being less linked to [aging] than most of the others on the system. The similarity rate between them is .39, the lowest connection related to [aging] (see Appendix 4). Finally, the <family life> element in [aging] is central, and the social representation on [family] is probably the most closely linked to it.

Prototypical analysis

The prototypical analysis concerning [aging] had 17 as the frequency cut-off point, as words with that count or more accounted for around 35% of overall evocations. The median for proportions of rank 1 responses per word included on the table (minimum count 5) was 40. Results from Table 27 show that <wisdom> is the most mentioned word, indicated by almost one fifth of the sample – which is not little if the fact that only three evocations, instead of the more usual four or five, were allowed. <Grandparents>, a word likely related to the more general <family life> element, is very close in frequency, and its average rank is smaller. Also, the proportion of times mentioned in rank 1 is higher in comparison to <wisdom>. Other words in the first quadrant include the <elderly person> and <loneliness> – interpreted here as two particular examples of <social exclusion> - and <wrinkles>. Still, word the frequencies of <wisdom> and <grandparents> have a gap concerning those of the remaining elements.

As for the quadrant with high frequencies but also high ranks, <death> is the most remarkable element, as it is the most cited word overall. Its average rank (2.21) is not too far from the median cut-off point of 2, but the proportion of times in rank 1 is below the median value of .40, which certifies the exclusion of that word from the first quadrant according to prototypical criteria. The frequency of <illness> is lower, and barely above the cut-off point. The contrasting words quadrant (low frequencies and ranks) has words that are related in terms of meaning, such as <loss> and <decay> - both related to the <general decline> element -, or the <time> and <age> pair. <Maturity> and <experience> also bear similarities to <wisdom> in terms of overall meaning.

The fourth quadrant has <sadness> as a word with more than double the frequency of the rest. Most of the remaining words have their meanings connected to others that were more frequently mentioned, such as <old age> – related to <age> -, <white hair> which is also a physical sign of aging such as <wrinkles>, and <end> which can be related to <death>. So in both quadrants with low frequencies what can be found is mostly words that refer to particularities or side aspects of more global dimensions that are related to or represented by some of the most cited words. The observation of polarity and neutrality indexes confirms that [aging] has both strongly positive and negative elements, as suggested by the literature that identifies and opposition of gains and losses.

Table 27. Prototypical analysis for the stimulus word “aging”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 17	wisdom	28	1.82 (.42)	1.00	-1.00	death	34	2.12 (.24)	-.85	-.82
(34.9%)	grandparents	26	1.69 (.53)	.58	-.15	illness	17	2.11 (.24)	-1.00	-1.00
	elderly	18	1.67 (.50)	-.06	.67					
	loneliness	18	1.94 (.44)	-.83	-.67					
	wrinkles	17	1.53 (.58)	-.65	-.29					
F. < 17	age	10	1.50 (.60)	.00	.60	sadness	11	2.27 (.18)	-.91	-.82
	time	10	1.70 (.60)	-.10	.80	old age	5	2.00 (.20)	-.60	-.20
M1 = .40	loss	8	1.75 (.38)	-1.00	-1.00	change	5	2.40 (.20)	.00	1.00
	experience	8	1.88 (.25)	1.00	-1.00	white hair	5	2.60 (.20)	-.40	.20
	decay	7	1.71 (.43)	-1.00	-1.00	end	5	2.60 (.00)	-1.00	-1.00
	maturity	5	1.20 (.80)	.80	-.60					

F = frequency; M1 = median rank 1 proportion

Words with frequencies 20 or more accounted for around one third of the evocation total of the data regarding the stimulus word [family] (see Table 28). The median for rank 1 evocations was .40. Three elements are clearly salient on prototypical analysis results: <home>, <union> and <parents>. <Home> is the most mentioned word. However, <parents> refers to a general class which includes other words such as <mommy>, <mother> and <father>, which are also on the superior cut-off point half concerning average rank and rank 1 responses. <Union>, a word that refers to cohesion, introduces a general element class that could include <unity>, which is contained in the contrasting elements quadrant. <Affect> is in the first quadrant, but its rank 1 proportion is below the median cut-off point. However, taken together with words from other quadrants such as love and warmth it forms a set linked to <love>. <Love> itself is fairly cited but it is below the cut-off point on the rank criteria.

The first peripheral quadrants - high frequency and rank, and the contrasting elements one - present two interchangeable notions, <children> and <kids>. Finally, the most cited word on the far peripheral quadrant, <support>, provides the traces for a system that could guide the grouping of other disperse words which are related in meaning, such as security, protection and help. All in all, the representation field concerning family seems to be organized by the elements <home>, <union> and <parents>, while other elements that emerge from the grouping of words also play an important role on the representation. Such elements can be labeled as <love>, <children> and <support>. In terms of affective loading, all the words have positive loads, some of them (such as <union>, <love> and <affect>) obtaining the maximum rating.

Table 28. Prototypical analysis for the stimulus word “family”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 20	home	34	1.88 (.41)	.56	-.12	love	31	2.07 (.35)	1.00	-1.00
(33.6%)	union	25	1.64 (.52)	1.00	-1.00	children	21	2.23 (.19)	.67	-.52
	affect	21	1.91 (.24)	1.00	-1.00					
	parents	20	1.45 (.60)	.65	-.50					
F. < 20	mommy	16	1.50 (.63)	.94	-.88	support	11	2.00 (.36)	.91	-.82
	unity	11	1.64 (.55)	1.00	-1.00	security	8	2.13 (.38)	1.00	-1.00
M1 = .40	father	10	1.60 (.40)	.60	-.20	protection	6	2.17 (.33)	1.00	-1.00
	mother	9	1.67 (.44)	.56	-.11	sister	6	2.83 (.00)	.67	-.33
	sharing	9	1.89 (.22)	.89	-.78	help	5	2.00 (.20)	.60	-.20
	warmth	7	1.57 (.57)	1.00	-1.00	group	5	2.00 (.40)	.60	-.20
	kids	6	1.50 (.50)	1.00	-1.00	link	5	2.20 (.40)	1.00	-1.00
	core	6	1.50 (.67)	.67	-.33	relatives	5	2.20 (.20)	.80	-.60
	numerous	6	1.50 (.67)	.83	-.67	marriage	5	2.40 (.00)	1.00	-1.00
						serenity	5	2.40 (.20)	1.00	-1.00

F = frequency; M1 = median rank 1 proportion

For the analysis of [death], the cut-off point for frequency was 12. The median for rank 1 proportions was .41. As the results from Table 29 show, there was no quadrant in the analysis with elements with both high frequencies and ranks, which indicates a more clear-cut organization of the important elements. Such a statement is also supported by their high rank 1 proportions, all above the median.

The most mentioned word is <end>, communicating the idea that death is the end of a period or cycle. Other than that, the other four elements from the first quadrant provide the basis for the main elements of the representation. <Pain> can be related to <suffering>, a word from the fourth quadrant. <Sadness> is linked to <crying>, also in the fourth quadrant, and <grief> and <sad> in the contrasting elements zone. <Fear> is also an element to be considered, regarding the emotional reaction towards death, understandable once that all the other elements are taken into consideration. Finally, <illness> is in the first quadrant as well, but its frequency is precisely on the cut-off for the frequency criterion, differently from all other first quadrant words. This indicates a less stable position of illness on the representation field, as it might result from a casual configuration of data.

Finally, some words from the contrasting zone refer to situations and objects that are concrete events in which death is experienced, such as the <tomb>, <funeral> and <cemetery>. Others are more abstract symbols related to the concept, such as <black> and <dark>. The vast majority of elements have a negative connotation.

Table 29. Prototypical analysis for the stimulus word “death”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 12	end	38	1.82 (.50)	-.58	-.37					
(30.2%)	pain	32	1.78 (.41)	-.94	-.88					
	sadness	29	1.69 (.48)	-.90	.79					
	fear	26	1.81 (.46)	-.96	-.92					
	illness	12	1.67 (.50)	-.92	-.83					
F. < 12	tomb	11	1.64 (.45)	-.27	.45	suffering	11	2.27 (.00)	-1.00	-1.00
	grief	10	1.70 (.50)	-.70	-.80	loneliness	9	2.33 (.22)	-.89	-.78
M1 = .41	cemetery	10	1.80 (.40)	-.20	.60	life	8	2.00 (.50)	.38	.25
	old age	10	1.90 (.40)	.40	-.20	crying	7	2.00 (.26)	-.86	-.71
	loss	9	1.89 (.56)	-1.00	-1.00	inevitabile	6	2.00 (.33)	-.50	-.67
	funeral	8	1.50 (.50)	-.38	-.25	unknown	5	2.40 (.00)	-.20	-.20
	dark	8	1.88 (.50)	-.63	-.25	empty	5	2.40 (.20)	-1.00	-1.00
	black	6	1.67 (.33)	-.33	.33					
	sad	5	1.60 (.40)	-.80	-.80					

F = frequency; M1 = median rank 1 proportion

The prototypical analysis on [health] had 15 as the frequency cut-off point, distinguishing 30% of evocation totals. The median for rank 1 proportions was .33. The results are presented in Table 30. The emphasized word in the first quadrant is <well-being>, with a superior classification in all criteria. Possibly, responses from other quadrants which are related to this concept are <happiness> and <to be well>. The word <illness>, from the first quadrant, indicates a relationship of opposition with [health]. The words <life> and <good> are also in the first quadrant, but with lower frequencies, and their meanings do not say much in terms of social dimensions.

The second quadrant, with high frequencies and ranks, contains only the word <hospital>. It is just below the median and the rank cut-off points, and its frequency is higher than those of <life> and <good>, which indicates a likely important role for <hospital> in the representation structure. The presence of the words <medicine> and <doctor> in the remaining quadrants suggests that those words could be classified in a more general element labeled <medical care>. Finally, the <physique> word from the contrasting zone, as well as <body>, <physical activity> and <sport>, could be integrated in a more global element. Aside from <illness>, which has a strongly negative profile, all other elements are positive or neutral.

Table 30. Prototypical analysis for the stimulus word “health”.

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 15	well-being	49	1.63 (.55)	1.00	-1.00	hospital	25	2.08 (.32)	-.08	.20
(30.0%)	illness	28	1.64 (.50)	-.89	-.93					
	life	19	1.84 (.50)	.89	-.79					
	good	15	1.47 (.73)	.93	-0.87					
F. < 15	happiness	10	1.90 (.30)	1.00	-1.00	doctor	12	2.00 (.42)		
	physique	9	1.89 (.44)	.56	-.11	care	10	2.40 (.00)	.00	-.20
M1 = .33	luck	5	1.80 (.60)	.60	-.20	sport	9	2.00 (.22)	.67	-.33
	important	10	1.70 (.30)	.70	-.40	youth	8	2.25 (.25)	.25	.50
	medicine	12	1.83 (.33)	.33	-.33	mental	8	2.63 (.00)	.13	.25
						to be well	6	2.00 (.33)	1.00	-1.00
						body	6	2.17 (.33)	.33	.33
						physic. activ.	5	2.20 (.20)	1.00	-1.00
						health(sanità)	5	2.20 (.40)	.40	-.60
						serenity	5	2.40 (.20)	.80	-.60

F = frequency; M1 = median rank 1 proportion

As presented in Table 31, the prototypical analysis for the analysis of data regarding [time] had 9 as a cut-off point. Words with that frequency or higher accounted for around 30% of overall evocation totals. The median for rank 1 proportions was .40. From a social point of view, the data about time indicate that there is no clear social representation about it. There is only one word that was mentioned by more than 10% of the participants: <clock>, a word which designates the device through which people keep track of time. That response indicates a mere descriptive tendency regarding time, and has little social interest. The remaining words, even including those in the first quadrant, have very close frequencies, which indicates low differentiation and no clear representation structure. The mentioned ideas relate to attributed qualities of time, such as it being <free>, <infinite>, and <fast>. There is even a number of associations related to time in the sense of weather, which is legit in Italian language.

Table 31. Prototypical analysis for the stimulus word “time”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 9	clock	32	1.53 (.59)	.00	.88	life	13	2.08 (.38)	.85	-.69
(30.8%)	fast	16	1.63 (.50)	-.69	-.38	sun	10	2.00 (.40)	1.00	-1.00
	pouring	12	1.83 (.50)	-.17	.33	old age	9	2.00 (.22)	-.78	-.56
	free	11	1.91 (.45)	-82	-.64	weather forec.	9	2.44 (.11)	.00	1.00
	hurry	10	1.70 (.50)	-.80	-1.00					
	hours	9	1.56 (.67)	.11	.78					
	infinite	9	1.78 (.44)	.33	-.11					
F. < 9	rain	8	1.63 (.38)	-.50	-00	years	6	2.33 (.33)	.00	1.00
	passes	7	1.57 (.72)	-.43	-.43	precious	6	2.33 (.17)	.83	-.67
M1 = .40	past	7	1.86 (.29)	.71	-.43	money(denaro)	6	2.50 (.00)	-.17	.67
	little	7	1.86 (.43)	-.43	-.43	aging	5	2.00 (.20)	-.40	.20
	relative	5	1.60 (.60)	.00	1.00	seasons	5	2.00 (.40)	.20	.60
	present	5	1.80 (.60)	.40	.20	growth	5	2.20 (.00)	1.00	-1.00
						age	5	2.20 (.20)	.00	1.00

F = frequency; M1 = median rank 1 proportion

Discussion

The results of the similarity analysis confirm that the choice of objects for the study was pertinent, as the direct evaluations of participants point out that [aging] is the key representation to organize the whole set: it is as if the other ones fit the system to the extent that they are associated with [aging], even if some of them are more closely connected with other objects – that is the case of [health] and [family]. It is important to remember that the instructions made no special mention to the [aging] topic or to any other object. Also, the higher mean community index associated with [aging] in comparison with the other objects, even if purely at a descriptive level, is another result that indicates that the representation set is centered on [aging].

It is pertinent to make it clear that if other social objects were included, or some of the objects that were investigated were suppressed from the study, the configuration of the maximum tree would probably be very different. But the selection of those six objects to assess at an exploratory level the structural relations within a representational system concerning [aging] proved adequate according to the obtained results.

After observing the results from the maximum tree, a choice was made to restrict in-depth investigation to five social objects: [aging], [time], [death], [family] and [health], due to already mentioned reasons. Of those social representations, [health] and [family] have positive overall affective loadings, [time] is neutral, and [aging] and [death] are negative. The distribution of evocations points out that [family], [health] and [death] generate more consensual and less

diversified responses, which can be interpreted as a sign of the existence of well structured social representations for those objects, according to Flament and Rouquette (2003).

The results from prototypical analyses allowed identifying four well structured social representation structures for our sample of young Italian students. [Aging] is represented as a process that leads to death, and one's grandparents are already on the final part of it, as well as elderly people in general. It is also a process marked by generalized decline in many aspects of life. Further negative events closely associated with aging are the coming of illness and physical signs of getting old, and loneliness. The fact that there are various positive and negative elements in the analysis quadrants is an evidence that overall it is a representation marked by a coexistence of gains and losses, a general pattern found in other studies (Veloz *et al.*, 1999; Wachelke *et. al.*, 2008).

[Death] is represented as an event that leads to the end of one's life or existence, and thinking of it or reacting to other people's deaths is associated with emotional reactions such as sadness, suffering and fear. Even if the understanding of [death] as the end of life associated with affective reactions is compatible with results found by other studies, the absence of elements of a religious nature such as <passing> and <return> is remarkable; which contrasts our results to research conducted with Brazilian health professionals (Nascimento, 2001; Nascimento & Roazzi, 2007).

The results from prototypical analysis about [family] allow advancing the interpretation that, for our sample, it is a social unit in which parents are there, its members love each other and are very united. Regarding some important contingent elements, it is often associated with one's home, and it is a context in which people usually find support. Finally, it is a unit associated with the raising and the presence of children. It must also be commented that when participants think about family, they have the nuclear family in mind: parents and children. The grandparents are not directly included in the results.

The shared knowledge about [health] is centered on the notions of well-being and the contrast with illness. The remaining elements refer mostly to contexts and actors related to health care.

The prototypical analysis for [time] do not indicate an established structure, only a handful of basic disconnected ideas that indicate lack of communication about the theme. Even if through other means it is possible to investigate shared knowledge concerning time management (cf. Ramos, 1992), [time] does not seem suitable for classical research employing word association techniques for the characterization of social representation structures. Also, it might even be that there is not a social representation on [time], but a wider collective one that is not differentiated

between social groups of a same society. The absence of discourse organization on [time] leads us to think that due to a lack of direct communication about the object, it does have a strong abstract character and is rather 'taken for granted'; if it is the case that it is a highly abstract social object that is associated with more homogeneously shared knowledge between groups, then ideological constructs such as thêmata (Moscovici & Vignaux, 1994) or epistemic schemes (Flament & Rouquette, 2003) are probably more pertinent to study it. That is why we will not proceed with the understanding that [time] is a social representation, and will not deal with it from this point further.

Figure 4 presents a summary of the results of prototypical analyses set together, as a try to make sense of likely coordination relations between social representations, at the level of connections between social object labels and cognems and between cognems from different representations. In the first case, we speak of cognems that have their meaning related to a whole another social representation structure, and by linking them to a whole object label we mean that it is necessary to take the meaning of the social representation complex to try to understand the relation. In the second case, it is possible to also have a hint on which elements of the related social representations might be linked to the first element. Since our goal is to identify inter-representation relations involving [aging], only relations concerning that object have been pointed out.

Only the results for [aging], [death], [health] and [family] have been included. Each of the four large squares refers to a single representation structure, with the social object label that is associated with it in bold next to it. Words in capital letters refer to elements situated in the first quadrants (high frequency and low evocation ranks) of prototypical analyses; the other ones are elements from the second quadrant (high frequency and high evocation ranks). Plus and minus signs refer to the affective loadings of the elements given by the participants, while neutral elements are those not followed by a sign.

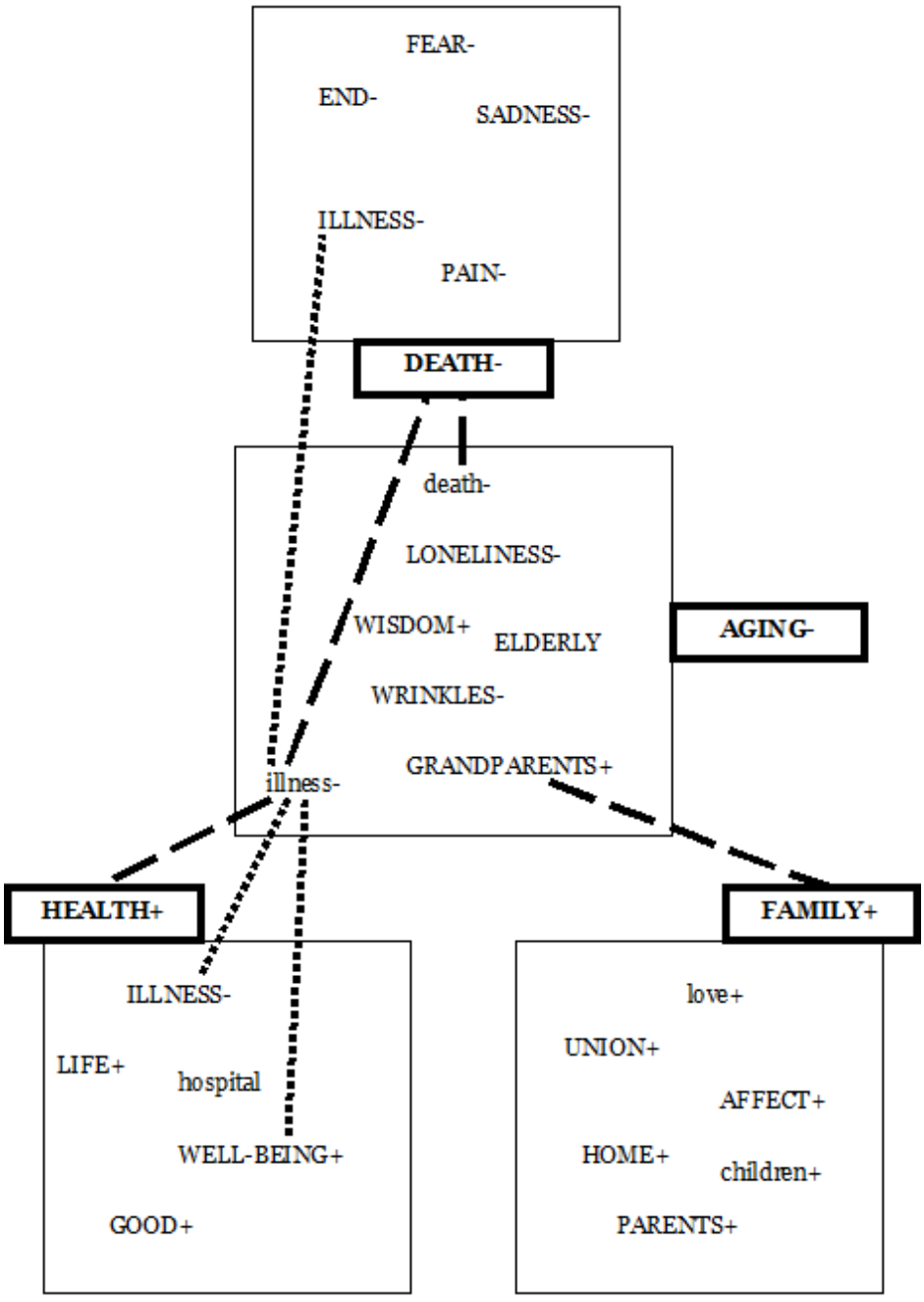

Figure 4. Inter-representation coordination relations inferred from prototypical analysis

There are three elements from [aging] with contents that are probably related to the other representations. <Aging-illness> is probably related to [death] and [health]. As indicated by the cognem relation lines, the understanding that to age is to have to face health problems and illness means that one has to understand the relationship maintained by the concept of illness with the concept of [health], and that also involves <well being>. Depending on what that concept is, the understanding that aging is affected by illness, or the qualification acquired by the <illness> element, might change.

The element <grandparents> from [aging] is an evident cognem linked to a [family] role, to be understood according to the whole meaning complex that is the social representation on [family]. The <death> element from the representation on [aging] is labeled by a verbal sign that also labels the social object [death], indicating that the global representation on [death] qualifies the meaning of the <aging-death> element.

We chose not to refer to the central or peripheral status of prototypical analysis elements since we depart from the understanding that they do not really constitute social representation elements in the strict sense; many of them might be grouped or classified into more general elements that probably do a better job as social representation cognems. Word evocations usually are particular expressions of more general elements, and even Vergès (1992), who created prototypical analysis, has arrived to more general elements through categorization and classification.

Also, the fact that word evocation tasks are heavily affected by context salience effects (Guimelli & Deschamps, 2000; Wachelke 2007) means that they provide less stable and sometimes misleading results. From the results of Study 1-A, we have came to learn that <wisdom> had a peripheral structural status with a very similar Italian students sample; observing prototypical analysis results from the current study, one might conclude that it is central. In the Brazilian sample of Study 1-B, it indeed was a central element, but various other studies with specific centrality assessment techniques tend to conclude that it is a peripheral element, even in Brazilian undergraduates samples (Wachelke & Lins, 2008; Wachelke, 2009), which makes it sensible to consider prototypical analysis results with caution, in what concerns structural status.

Our results also point out to the possibility that two social representations from the system maintain a conjunction relation, that is, that an intersection involving verbal signs associated with object labels or cognems is identified in the two structures (Flament & Rouquette, 2003). If we try to group some of the found elements from prototypical analysis into more general and relevant elements, then <aging-grandparents> could be translated easily into a <family life> or <family>

element. In that case, if there is really a coordination relation between [aging] and [family], and especially if it is found that a peripheral element related to the aging process is found within the structure of [family], then we would come across a configuration close to that of an embedding relation (Abric & Vergès, 1996). In that type of relation, the verbal sign assigning the social object label from one social representation is contained in the core of another one, and the social object label from the second representation designates a peripheral element in the structure of the first one. If that is the case, then the social representation on [aging] would be subordinate to the social representation on [family], just as in Abric and Vergès (1996) study the social representation on [bank] depended on the social representation on [money]. No peripheral element related to [aging] in the structure of [family] was identified in this study; further research employing different representation characterization techniques might explore that possibility, though.

The present study consisted of an exploratory survey on possible relations involving the social representation on [aging] within the representational system that it organizes. All inter-representation cognem relations were inferred from the contents of those cognems. The results allow for the identification of possible associations of shared knowledge structures that might help explain the contents and structure of the social representation on [aging], and as such it adds up to the pertinence of characterizing social representation systems other than just isolated structures. It must be reminded that the problem of identifying social representation 'borders' or limits is a long-debated and still unresolved issue (Flament, 1987, 1994a; Rouquette, 1994b; Fraissé, 2000; Flament & Rouquette, 2003). It is a decision on the part of the researcher, to a large extent, that determines where a representation begins and where it ends. If so, then it becomes even more important to take into account the network of relations that different representations maintain, one object being conceived according to the beliefs that people have on a second object, or a specific aspect of it, and so on. This study is a first step in that direction.

The instability and context-vulnerability of prototypical analyses, as well as the somewhat subjective identification of inter-representation relations possibly constituted the main limitations of the study. Further research is needed to provide more refinement to those results and arrive to a clear and stable characterization of those relations. Future studies should characterize the structural status of the cognems within each structure, through questioning (*mise en cause*) tasks (Moliner, 1994; 2001a) and assess the existence of inter-representation relations through some sort of formalization resource such as the basic cognitive schemes model (Guimelli & Rouquette, 1992; Rouquette, 1994a).

Those are some of the next steps to be taken in the research described in the next chapter: to determine with more precision the structural status of elements in those representation structures and to assess through the SCB model the relations among the selected social representations, at the level of social object labels. That is a first level in which coordination relations can be identified. Also, with a more precise characterization of single structures, it is possible to identify likely relations between cognems of different representations.

Chapter 6: Characterization of coordination relations involving social representation object labels within the representational system and identification of inter-representation cognem relations

After a first level of the exploration of inter-representation relations within the representation system organized around the social representation on [aging] (see Chapter 5), we need to characterize those relations with more precision, in terms of association strength and qualification of relation types. In structural terms, this means assessing those relations in the terms of the basic cognitive schemes model, so that they can be qualitatively and quantitatively characterized. That is a second characterization level of the system.

A first possibility for characterizing inter-representation relations was introduced by Fraissé's (2000) work. As mentioned in Chapter 3, she directly introduced verbal signs as the lexical terms (*A* and *B*) of the SCB triplet, rather than asking research participants to provide associations to an *A* term. By doing so, she was the first to employ a forced or constituted association SCB procedure, and introduced a new level of assessment of relations between social representations: the direct relations between social objects.

Taken this way, we can consider that it is a kind of relation that is situated at a higher-order level, summarizing the relations involving the global meanings associated with each social representation structure. In other words, we can call it an object-to-object (OtO) inter-representation coordination.

Figure 5 illustrates this kind of relation. The squares refer to the identifiers (social object labels) of two social representations, Representation 1 (R1) and Representation 2 (R2), each of them maintaining object-to-cognem relations with the object label. Each single structure is a first-order structure, while the system is a second-order one. What makes it possible to consider a representational system as a second-order structure is the existence of connections between its components, i.e., the single representations.

If the basic cognitive schemes model is adopted as a qualifying classification of relation types involving structural units (see Chapter 2), then it makes sense to employ it to qualify OtO relations within a representational system. To do so is one of the aims of the research presented in this chapter, so as to refine the characterization of the representational system of interest. A second aim involves the characterization of the structural status of the elements within each of those social representations, and also to identify likely cognem-to-cognem (CtC) relations through direct evaluations, in a way similar to what was done to characterize the perceived distances among social

objects in Chapter 5. The information regarding structure characterization and possibility of inter-representation relations at the level of cognems should make it possible to proceed to a refinement of those relations according to an SCB formalization, in Part IV. The assessment of CtC inter-representation coordination relations is the main concern of this thesis.

For that purpose, a quasi-experiment (Study 3) was conducted to assess the SCB valences of the relations involving [aging] and the three other social representations retained in Chapter 5: [family], [health] and [family]. However, Study 3 had a double nature; in its second half, the study had more of an exploratory survey nature.

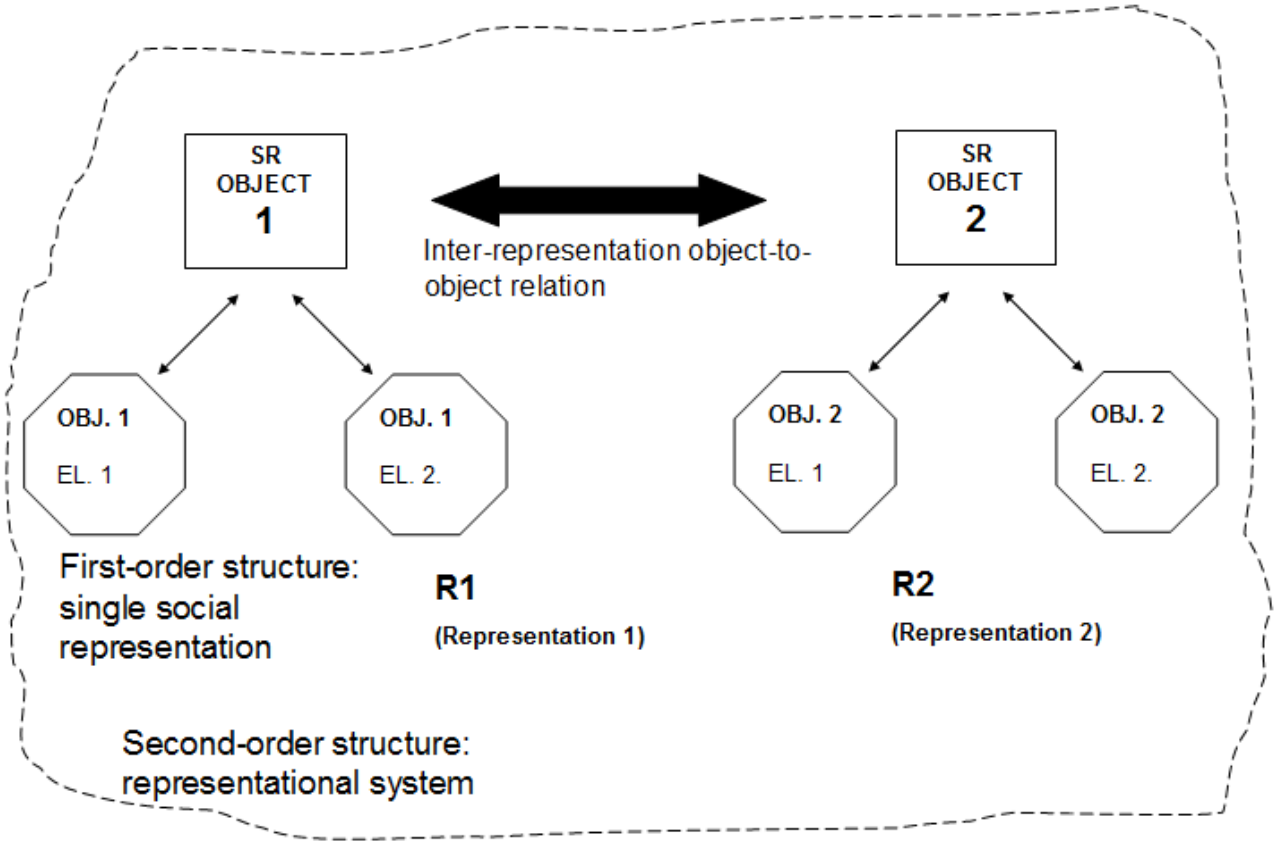

Figure 5. Illustration of an inter representation object-to-object relation within a representational system

Study 3

Method

Design

The study had a 2 x 3 independent measures quasi-experimental design, which was related to a forced association basic cognitive schemes (SCB) task (cf. Fraissé, 2000; Milland, 2001). The first factor accounted for the order of the [aging] label on the '*A c B*' triplet[11] that is characteristic of SCB tasks, with modality one being [aging] as the *A* term, and modality two being [aging] as the *B* term. The second factor related to the object entered in the SCB triplet together with [aging], with modality one: [death], modality two: [health] and modality three: [family] (see Figure 6).

SCB triplet order	Second object included in triplet		
	Death	Health	Family
Aging as A	Aging - Death	Aging - Health	Aging – Family
Aging as B	Death - Aging	Health - Aging	Family - Aging

Figure 6. Independent measures research design

Participants

A total of 102 undergraduates from the University of Padua composed the study sample. The majority of them, 77 (75.5%) were women. Participants' ages ranged from 19 to 26 years old, with a mean of 21.19 years (*SD* = 1.40) and a median of 21 years. A total of 62 participants (60.8%) were enrolled on the second year of the Psychology course, while the other 40 were Motor Sciences students enrolled on the third year of the course.

Instrument

A questionnaire in Italian language was employed in data collection. There were 6 versions of the questionnaire, each one involving the assessment of relationships between [aging] and two

[11] *A c B = A connector B*. As explained in Chapter 2, a triplet consists of two verbal signs, usually nouns, which are related through a connector – also called operator – that is related to a basic cognitive scheme.

other social objects, out of the following three: [health], [death] and [family]. On the opening page, participants were informed that they would provide their opinions about themes of social life. After that, they had to fill in two forced association basic cognitive schemes (SCB) task (cf. Fraissé, 2000; Milland, 2001) relating the social object label [aging] with the other two social objects. On one of the tasks, [aging] was the first term on the '*A c B*' triplet of SCB tasks, and the other one was the B term. The six versions included all possible combinations of [aging] with the other objects, as can be seen in Figure 7.

	Version 1A		Version 1B		Version 2A	
Task	A	B	A	B	A	B
1	Aging	Health	Health	Aging	Family	Aging
2	Family	Aging	Aging	Family	Aging	Death
	Version 2B		Version 3A		Version 3B	
Task	A	B	A	B	A	B
1	Aging	Family	Aging	Death	Death	Aging
2	Death	Aging	Health	Aging	Aging	Health

Figure 7. SCB triplets for the six questionnaire versions

There were 17 participants per questionnaire version, which accounts for the total *N* of 102. However, each participant provided data for two conditions, under the assumption that evaluations were independent; therefore, it must be considered that the unit of analysis is the evaluation of SCB triplets, and not the participant. As a consequence, for each research condition of the design, there were 34 cases, for a total of 204 global evaluations involving representation object labels, each one containing 28 individual connectors evaluations.

Further, participants completed a centrality questionnaire task about the elements in [aging], with instructions and text identical to the ones employed in Studies 1-A and 1-B. All the seven previously studied elements were included. For each item, participants had to select one of four options: "certainly yes" (absolute acceptance), "probably yes" (conditional acceptance), "probably no" (conditional rejection) and "certainly no" (absolute rejection).

Following the questioning items, there were affective loading and social implication items identical to the ones employed in Studies 1-A and 1-B.

After providing responses about the first object in the questionnaire, participants had to answer to two series like the previous one, a sequence of one questioning task, one affective loading task and one social implication task about the two other objects included in their version of the questionnaire.

Three elements were evaluated for each other social object, elaborated from the results of Study 2. Questioning items on [death] were introduced by: "can you think about the death of a person …". The elements that were assessed were <sadness> (...without it causing sadness?), <end of existence> (without remembering that it is the end of existence) and <fear> (without having fear). Items about [health] (...can you say that a situation relates to the health of a person if...) were <well-being> (it is not related to his/her well-being), <illness treatment and prevention> (it is not related to the treatment or prevention of illnesses) and <medical care> (it does not imply medical care). Finally, items on [family] (…can you say that a group of people is a family if…) were <love> (among them there is not love), <support> (they do not support each other) and <parents> (none of them is a parent of another). The items were all framed in negative form.

The final part of the questionnaire aimed at evaluating the existence of relationships among elements of representations on [health], [family] and [death] and elements of the representation on [aging]. Short sentences - each one related to one of the elements related to the mentioned objects, the same ones that were present in previous parts of the questionnaire versions - were presented next to a second sentence related to one of the seven elements of the representation on aging, in a total of 9 (elements related to [health], [family] and [death]) x 7 (elements related to [aging]) = 63 pairs. However, each participant only had 42 pairs in the questionnaire, as only the items related to the objects dealt with in their specific questionnaire versions were included in this task.

For each pair, the first sentence ('sentence A') was the one related to one of the three objects, and the second one ('sentence B') referred to an element of [aging]. Participants should select one of five options: 1. A and B are not related; 2. A is one cause of B; 3. B is one cause of A; 4. A and B mutually influence each other; and 5. A and B have a common cause. Those items form a simplified attribution scheme involving different cognems, with the goal of mapping possible links between representation structures, in order to locate relationships involving the representation on [aging] and other representations that are linked to it in the same representational system. At the very end of the form, participants provided information regarding their graduation course, age and gender.

Procedure

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

Data analysis

Three structural levels of social representations were dealt with in data analysis. At an implication level, the implication of participants by representation objects was assessed. At a within-representation level, the structural statuses of cognems were evaluated in terms of centrality and affective loading. At an inter-representation level, the direct relationships among social representations objects, or in other words, their labels, were assessed, and also the relationships between cognems from different social representation structures.

For the social implication level, all conditions were analyzed together and items were dichotomized in order to have low and high dimension proportions. One-way chi square tests were employed to test if the sample leaned on a particular direction.

At the within-representation level, data was also analyzed as a whole. Acceptance and rejection choices were merged, dichotomizing response options. We chose to employ the same cut-off proportion identified in Study 1-A to differentiate between central and peripheral status (67.5%), prioritizing a uniform effect size criterion across studies to the detriment of statistical significance testing. For the affective loading evaluation, the polarity and neutrality indexes proposed by De Rosa (1993), which have already been employed in Studies 1-A and 1-B, have been calculated.

At the inter-representational level log-linear analyses were conducted to assess the effects of the order of cognem labels on the task and representation object labels on the activation of basic cognitive schemes. Scheme activation was the dichotomous dependent variable for all analyses, taking values “No” (“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). Analysis 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). The number of cases in each table varied accordingly with the number of connectors: 3 objects x 2 triplet orders x 34 cases per condition x number of connectors. So, for the overall SCB set there were 5712 cases, for the Description set there were 1836 cases in the table, 2448 for Praxis and 1428 for Attribution.

A second type of analysis at the inter-representation level consisted in the evaluation of relationships among the cognems of the social representation on [aging] and the cognems linked to

the other three objects. First, items were dichotomized, taking the values of either the non-existence (option A and B are not related) or existence (all other four options) of any given relationships; one-way chi square tests were performed to verify if there was a predominant response. When proportions in favor of the existence of a relationship were significantly higher, then further analyses were carried out with other one-way chi square tests in order to assess the prevalence of specific types of relationships.

Hypotheses and expectations

For the quasi-experimental part related to logical relationships among objects, there was only one hypothesis, supported by the results of similarity ratings from Study 2: [death] and [health], both perceived by participants as more closely related to [aging] than [family], should follow a general trend to activate more basic cognitive schemes connectors than the latter. This hypothesis is justified because, as pointed out in Chapter 5, the perceived proximity rate linking [aging] and [family], .39, is considerably lower than the proximity ratings linking [aging] to [death] and [family] (.93 and .81, respectively). There were no hypotheses linked to the activation of specific meta-schemes; the assessment of such relationship levels had basically an exploratory goal, as an eventual source of further hypotheses to guide further investigation.

Concerning the survey part of the study, it was expected that the proportions of highly-implied participants would be higher for social implication dimensions related to [health] and [family] than to [death] and [aging], as the former topics are supposedly more present in everyday lives of young people, which should affect at least the personal identification and frequency of communication dimensions, more related to everyday life. Direct social valuation and perceived possibility of action refer to evaluations that do not necessarily require that participants are dealing with the objects regularly, so different profiles for the activation of those dimensions by each object were not expected.

The centrality tests of representation elements had a confirmatory purpose, and no hypotheses were formulated for those either. There were also no hypotheses directed to the assessments of relationships among cognems from different representations, as they had a goal of identifying element-level connections to be explored in further studies.

Results

Social implication

Items about social implication dimensions were dichotomized with the lowest two responses indicating low implication on that dimension, and the higher ones standing for high implication. Concerning [aging], most participants (61.8%) had low personal identification [Yates $\chi 2$ (1, N = 102) = 5.18, p = .023, w = .24], and another majority (72.5%) also reported low frequency of communication on the theme [Yates $\chi 2$ (1, N = 102) = 19.86, p < .001, w = .45]. On the other hand, when providing a direct evaluation of social valuation of the issue, 60.8% of participants said that it was an important theme [Yates $\chi 2$ (1, N = 102) = 4.32, p = .038, w = .22] and 63.7% perceived aging as something that they could act upon [Yates $\chi 2$ (1, N = 102) = 7.14, p = .008, w = .27].

For the [death] object, participants were divided on their identification with it, with a non-significant prevalence of 54.4% of those who had high personal identification with the theme [Yates $\chi 2$ (1, N = 68) = .36, p = .549]. The sample was also relatively balanced for the frequency of communication regarding [death], with 60.3% of participants reporting not communicating with others often about it [Yates $\chi 2$ (1, N = 68) = 2.48, p = .115] and 61.8% judging it as an important social theme [Yates $\chi 2$ (1, N = 68) = 3.30, p = .059]. For the perceived possibility of action, there was a slight predominance of participants who thought that little can be done about dying, 64.7% [Yates $\chi 2$ (1, N = 68) = 5.30, p = .021, w = .29].

Participants reported to be highly implied in all social implication dimensions for the [health] and [family] social objects. For [health], 86.8% were highly identified [Yates $\chi 2$ (1, N = 68) = 35.30, p < .001, w = .74], 88.2% indicated that having good health depended on them to a large extent [Yates $\chi 2$ (1, N = 68) = 38.25, p < .001, w = .76], 67.6% reported communicating about it often [Yates $\chi 2$ (1, N = 68) = 7.78, p = .005, w = .35], and 89.7% considered it an important issue [Yates $\chi 2$ (1, N = 68) = 41.30, p < .001, w = .79]. [Family] had even higher high implication proportions, with 92.6% in personal identification [Yates $\chi 2$ (1, N = 68) = 47.781, p < .001, w = .85], 97.1% in perceived possibility of action [Yates $\chi 2$ (1, N = 68) = 58.36, p < .001, w = .94], 85.3% in frequency of communication [Yates $\chi 2$ (1, N = 68) = 32.48, p < .001, w = .71] and 89.7% in the direct evaluation of importance [Yates $\chi 2$ (1, N = 68) = 41.30, p < .001, w = .79].

To sum it, up, social implication measures indicate that participants are very highly implied by the objects [health] and [family]. Those are themes that participants think that they can do much about, and evaluate as being important aspects of their own lives, included in everyday conversation as well. In contrast, [aging] is considered as a theme that does not relate to them closely. It is a topic about which they do not talk to others, but nonetheless it is conceived as something important that is under a certain degree of personal control. Finally, participants' implication by [death] is mostly

heterogeneous, with balanced proportions for identification, social valuation and frequency of communication. Yet, it is predominantly thought as something outside their influence.

Structural status of representation elements

Items with 67.5% in rejection response proportions or higher were classified as related to central elements on their respective representations, and those with lower ones were classified as peripheral. For central elements only, further chi square testes including only the rejection responses ("Probably no" and "Certainly no") assessed the prevalence of one of them. This was an indirect approach of measuring the conditionality of central elements, based on Lheureux, Rateau and Guimelli's (2008) discoveries of the relationships between conditionality and central core hierarchy. Items with prevalent absolute rejection responses ("Certainly no") were classified as prioritary central elements, i.e., having a defining nature, while items with prevalent conditional rejection responses ("Probably no") were identified as adjunct central elements, i.e., having a normative role on the representation. Items without a significant difference in rejection proportions were classified as performing a mixed role.

As reported in Table 32, three of the analyzed elements of the social representation on [aging] were classified as central. <Social exclusion> was the cognem with the highest rejection rate, performing a normative role in the representation [Yates $\chi 2$ (1, N = 77) = 6.28, p = .012, w = .30], and thus qualifying as an adjunct central element.

<Family> also had high rejection, with a mixed profile in terms of a defining or normative role in the representation [$\chi 2$ (1, N = 76) = 0, p = 1]. The other central element, <general decline> had a normative profile, being classified as an adjunct central element [Yates $\chi 2$ (1, N = 70) = 8.92, p = .003, w = .31].

The polarity and neutrality indexes of elements, also shown in Table 32, show that all of them are strongly loaded in affect. <Family>, <wisdom> and <new activities> are considered as positive elements, while <social exclusion>, <general decline>, <death> and <health problems> are evaluated negatively.

Table 32. Rejection rates, polarity and neutrality for the element items of the social representation on [aging] and their structural status.

Element	Rej.rate %(Cond.Rej. / Abs.Rej.)	Pol.	Neut.	Status
Social exclusion	75.4 (64.9%* / 35.1)	-.84	-.76	Adj. Central
Family	74.5 (50.0 / 50.0)	.77	-.71	Mixed Central
General decline	68.6 (68.6** / 38.4)	-.78	-.88	Adj. Central
Health problems	61.8	-.58	-.66	Peripheral
Death	50.0	-.63	-.66	Peripheral
Wisdom	50.0	.88	-.80	Peripheral
New activities	47.1	.74	-.59	Peripheral

* $p < .05$ ** $p < .01$

[Aging] is thus represented as a process typically marked by a general decrease of mind and body functions, and by prejudice on the part of society. An aging person switches to prioritizing his or her family context. It is plausible that the <general decline> and <social exclusion> central elements manage the activation and actualization of important peripheral elements like <health problems> and <death>, which may be interpreted as conditional schemes that come into play when particularities of the aging process indicate that the decline of functions (whether social, psychological or physical, or all) and the lack of consideration by others is especially severe. <Wisdom>, on the other hand, might be linked to the grandparent role in the family, due to accumulated experience, or connected to a gain that comes from aging in general, on the condition that the decline does not affect mind functions. At last, <new activities> is a peripheral scheme that might be connected more strongly to retirement and the end of regular work activity, but such elements have not been dealt with in the present analyses. It must be stressed that the fore mentioned relationships among elements are to be taken strictly as possibilities, as no analysis has been carried out to assess them.

The rejection rates and affective coordinates of the three analyzed elements for the representation on [death] are presented in Table 33. <End of existence> had a central status, presenting a mixed profile in terms of definition power and normativity [Yates χ^2 (1, N = 50) =.02, p = .888]. <Sadness> and <fear> were characterized as peripheral elements.

All three elements on [death] are negatively loaded in terms of affect. Results point out that the belief that death means the end of existence is central for that representation, but that according to our sample not always do people feel fear or sadness in the occasion of someone's death. Since

only three elements have been investigated, only their statuses are assessed; we do not try to provide a thorough description of representation structure. The same measure was adopted for [health] and [family].

Table 33. Rejection rates, polarity and neutrality for the element items of the social representation on [death] and their structural status.

Element	Rej.rate %(Cond.Ref. / Abs.Ref.)	Pol.	Neut.	Status
End of existence	73.5 (52.0 / 48.0)	-.51	-.61	Mixed Central
Sadness	64.7 (40.9 / 59.1)	-.67	-.71	Peripheral
Fear	61.8	-.61	-.58	Peripheral

Table 34 presents the rejection and affect loading data for [health]. The three elements, i.e., <well-being>, <illness treatment and prevention>, and <medical care> have a peripheral status. <Well-being> and <illness treatment and prevention> have positive evaluations, whereas <medical care> is predominantly positive but comprises also a fair amount of negative and neutral evaluations, as evidenced by the indexes.

Results indicate that none of the analyzed elements allows for a definition of the identity of the social representation on [health], as none of them is supported by a tendency to consensus. As such, <well-being>, <illness treatment> and <medical care> refer to events and characteristics that are not general to the notion of [health], but rather relate only to specific contexts in which [health] is relevant.

Table 34. Rejection rates, polarity and neutrality for the element items of the social representation on [health] and their structural status

Element	Rej.rate %(Cond.Rej. / Abs.Rej.)	Pol.	Neut.	Status
Well-being	57.4	.97	-.94	Peripheral
Illness treatm. and prev.	54.4	.58	-.64	Peripheral
Medical care	47.1	.25	-.48	Peripheral

The rejection rates and affective loading indexes for the elements on [family] that have been taken into account are presented in Table 35. <Love> is a central element with a mixed role in the representation [Yates $\chi 2$ (1, $N = 46$) = 3.681, $p = .055$], and so is <support> [Yates $\chi 2$ (1, $N = 56$) = .44, $p = .507$]. In contrast, the existence of one or more <parents> in a given group is a peripheral

characteristic. Concerning affective loadings, <love> and <support> have extreme positive evaluations. <Parents> is also evaluated positively, but not with such pronounced intensity.

Table 35. Rejection rates, polarity and neutrality for the element items of the social representation on [family] and their structural status

Element	Rej.rate % (Cond.Rej. / Abs.Rej.)	Pol.	Neut.	Status
Support	82.4 (44.6 / 55.4)	.98	-1.00	Mixed Central
Love	67.6 (34.8 / 65.2)	.94	-..94	Mixed Central
Parents	42.6	.44	-.44	Peripheral

According to participants' responses, for a given group of relatives to be considered as a family, there must or should be feelings of love among them, and the members must or should provide mutual support to each other. Even if one of the members is not a parent of some other member, the group may be considered a family – admitting thus the existence of groups with other types of indirect relationship, such as brothers, cousins, grandparents, and so on.

Inter-representational level

OtO (Object-to-object) relationships

Overall, most analyses indicated a prevalence of non-activation responses. This pattern is not unexpected, since object labels are directly provided by the questionnaire, as the task involves forced association. In standard SCB, participants themselves provide the answers, and therefore it is more likely that they will refer to more activated elements. The main effect of activation bears little interest for the assessment of the representation relations in this study, and will therefore no longer be commented[12].

The analysis with all SCB connectors (N = 5712) consisted of a calculation that provides an index similar to that of valence (cf. Guimelli & Rouquette, 1992). The response distribution is shown in Table 36. Results indicated significant Activation x Object [Y^2 (2) = 37.182, p < .001] and Order x Activation x Object interactions [Y^2 (2) = 28.867, p < .001]. The two-way interaction means

[12] Activation effect for the analysis with all SCB connectors: Y^2 (1, N = 5712) = 989.149, p < .001, z = 30.104. Activation effect for the analysis with Description connectors: Y^2 (1, N = 1836) = 509.399, p < .001, z = 20.876. Activation effect for the analysis with Praxis connectors: Y^2 (1, N = 2448) = 443.582, p < .001, z = 20.088. Activation effect for the analysis with Attribution connectors: Y^2 (1, N = 1428) = 98.035, p < .001, z = 9.814. All pertinent effects for the SCB analyses are reported in Appendix 7.

that the activation proportions for [health] (32.8%, z = 3.94) and [death] (31.3%, z = 2.24) in relationships with [aging] are higher than those of [family] (24.4%, z = -5.93). That result supports the findings of Study 2, in which research participants rated [death] and [health] as objects more related to [aging] than [family].

The three-way interaction indicates that the objects exhibit different activation profiles when the order of SCB terms is taken into account. [Health] is more activated when [aging] is the *A*-component of the triplet (36.9%, z = 5.35, $p < .001$), than when it is *B* (28.7%). [Death], on the contrary, has a non significant trend of being more activated when it is the first term (33.8%, z = 2.21, p = .054) than when [aging] is (28.7%), and [family] also shows a significant effect in that direction (21.5% as *A*, z = 2.99, $p < .01$ and 27.3% as *B*).

Table 36. Response distributions for the global set of SCB items (Triplet order x Representation object x Activation)

	Social representation object						
	Death		Health		Family		
Order	No	Yes	No	Yes	No	Yes	Total
Ag. A	679	273	600	352	747	205	2856
Ag. B	630	322	679	273	692	260	2856
Total	1309	595	1279	625	1439	465	5712
	1904		1904		1904		

Table 37 presents the activation of the Description meta-scheme (N = 1836). There were also Activation x Object [Y^2 (2) = 11.361, p = .004] and three-way [Y^2 (2) = 27,792, $p < .001$] interactions. [Death] had a tendency of being particularly more activated by description connectors (39.7%, z = 2.94, $p < .01$), and [family] was less chosen by participants (25.40%, z = -2.80, $p <$ .025). The three-way interaction displayed the same pattern from the global analysis, with [death] (z = 2.67, $p < .025$) and [family] (z = 2.51, $p < .025$) being proportionally more activated when they were first on the triplet, and the opposite pattern occurring for [health] (z = 5.20, $p < .001$).

Table 37. Response distributions for the Description meta-scheme items (Triplet order x Representation object x Activation)

	Social representation object						
	Death		Health		Family		
Order	No	Yes	No	Yes	No	Yes	Total
Ag. A	238	68	215	91	259	47	918
Ag. B	200	106	249	57	229	77	918
Total	438	174	464	148	488	124	1836
	612		612		612		

Table 38 presents the results for the Praxis scheme. The only significant effect is the Activation x Object interaction [Y^2 (2, N = 2448) = 13.402, p = .001], accounting for the lower activation of [family] (24.4%, z = -3.57, $p < .001$), in comparison with [death] (30.8%, z = 1.40, p = .16) and [health] (32%, z = 2.31, $p < .05$).

Table 38. Response distributions for the Praxis meta-scheme items (Triplet order x Representation object x Activation)

	Social representation object						
	Death		Health		Family		
Order	No	Yes	No	Yes	No	Yes	Total
Ag. A	287	121	273	135	309	99	1224
Ag. B	278	130	282	126	308	100	1224
Total	565	251	555	261	617	199	2448
	816		816		816		

There were both an Activation x Object interaction [Y^2 (2) = 25.138, $p < .001$] and a three-way one [Y^2 (2) = 16.567, $p < .001$] for the Attribution connectors set (N = 1428) (see Table 39). They show that [health] had favored activation (45.4%, z = 4.62, $p < .001$), mostly in the second position of the triplet (52.9% vs. 37.8% at *B*, z = 3.77, $p < .001$). In contrast, [family] was less activated than the other objects (29.8%, z = -3.94, $p < .001$), and showed a tendency for activation at the *A* position (34.9% vs. 24.8% at *A*, z = 3.19, $p < .005$).

Table 39. Response distributions for the Attribution meta-scheme items (Triplet order x Representation object x Activation)

	Social representation object						
	Death		Health		Family		
Order	No	Yes	No	Yes	No	Yes	Total
Ag. A	154	84	112	126	179	59	714
Ag. B	152	86	148	90	155	83	714
Total	306	170	260	216	334	142	1428
	476		476		476		

CtC (Cognem-to-cognem) relationships

Table 40 presents the results of the relationship of elements from the [death], [health] and [family] representations with the <death> cognem from [aging]. The cut-off point with the sample size of 68 to indicate the prevalence of the existence of any kind of relationship, when compared to the proportions of the perception that the cognems were not related, was 43, or 63.2% (w = .26). It can be observed that <death-sadness> and <death-fear> appear to be connected to <aging-death>. Relationship differentiation analysis did not show a predominant relationship for <death-sadness> [χ^2 (3, N = 55) = 5.58, p = .134], whereas the main relationship for <death-fear> indicates that it is perceived by participants as being caused by <aging-death>, at a proportion of 40.7% [χ^2 (3, N = 54) = 10.3, p = .016, w = .43][13].

Table 40. Cognem relationship proportions with <aging-death> (To age is to get closer to death)

A - Element	Relations. %	Yates χ^2 (1)	p
Death-Sadness (Death causes sadness)	80.9	24.72	< .001
Death-Fear (Death provokes fear)	79.4	22.36	< .001
Death-End (A person's existence is over after death)	60.3	2.48	= .115
Health-Medical care (To have health, medical care is needed)	44.1	---	---
Family-Support (Family members must support each other)	42.6	---	---
Health-Well being (To be healthy is to feel well)	42.6	---	---
Health-Illness t. p. (To have health is to not suffer from illness)	33.8	---	---
Family-Love (There must be love in a family)	16.2	---	---
Family-Parents (A family is formed by parents and children)	14.7	---	---

N = 68 for all items

[13] For detailed statistics on all cognem relationships, see Appendix 8.

Relationships concerning the <aging-wisdom> element are presented in Table 41. Relationship proportions were low, as no cognem from [health], [death] and [family] attained a significant relationship with it.

Table 41. Cognem relationship proportions with <aging-wisdom> (To age is to gain wisdom)

A - Element	Relations. %	Yates χ^2 (1)	*p*
Health-Well being (To be healthy is to feel well)	54.4	.36	= .549
Family-Support (Family members must support each other)	44.1	---	---
Family-Love (There must be love in a family)	36.8	---	---
Family-Parents (A family is formed by parents and children)	35.3	---	---
Death-Fear (Death provokes fear)	32.4	---	---
Health-Medical care (To have health, medical care is needed)	22.1	---	---
Death-Sadness (Death causes sadness)	16.2	---	---
Health-Illness t. p. (To have health is to not suffer from illness)	16.2	---	---
Death-End (A person's existence is over after death)	13.2	---	---

N = 68 for all items

As for <aging-new activities>, there were significant relationships with <health-well being> and <family-support>, as shown in Table 42. There was no privileged relationship type for <health-well being> [$\chi 2$ (3, N = 54) = 6.58, p = .086], but there was a tendency for the activation of two relationships for <family-support> [$\chi 2$ (3, N = 45) = 12.9, p = .005, w = .53]: <family-support> causes <aging-new activities> (37.8%) and <family-support> and <aging-new activities> influence each other (35.6%).

Table 42. Cognem relationship proportions with <aging-new activities> (To age is to take part in new activities)

A - Element	Relations. %	Yates χ^2 (1)	*p*
Health-Well being (To be healthy is to feel well)	79.4	22.36	< .001
Family-Support (Family members must support each other)	66.2	6.48	= .011
Family-Love (There must be love in a family)	48.5	---	---
Health-Illness t. p. (To have health is to not suffer from illness)	45.6	---	---
Family-Parents (A family is formed by parents and children)	38.2	---	---
Health-Medical care (To have health, medical care is needed)	32.4	---	---
Death-Sadness (Death causes sadness)	29.4	---	---
Death-Fear (Death provokes fear)	23.5	---	---
Death-End (A person's existence is over after death)	14.7	---	---

N = 68 for all items

For the <aging-social exclusion> element, one of the central elements of the representation, there were significant relationships with two other cognems, both of them related to [death]: <death-sadness> and <death-fear> (see Table 43). For both of them, the relationship indicating that

the [death] element is a cause of <aging-social exclusion> was very little active, and responses were distributed in a balanced way among the three other relationships: <death-sadness> and <death-fear> as being caused by the social exclusion connected to aging, as being bidirectionally influenced by it, or by having a common cause with the [aging] element [<death-sadness>: $\chi 2$ (3, N = 49) = 10.35, p = .016, w = .47; <death-fear>: $\chi 2$ (3, N = 43) = 7.88, p = .049, w = .42].

Table 43. Cognem relationship proportions with <aging-social exclusion> (To age is to be cast aside by others)

A - Element	Relations. %	Yates χ^2 (1)	p
Death-Sadness (Death causes sadness)	72.1	12.36	< .001
Death-Fear (Death provokes fear)	63.2	4.26	= .039
Family-Support (Family members must support each other)	52.9	.14	= .708
Family-Love (There must be love in a family)	47.1	---	---
Family-Parents (A family is formed by parents and children)	38.2	---	---
Death-End (A person's existence is over after death)	29.4	---	---
Health-Well being (To be healthy is to feel well)	14.7	---	---
Health-Illness t. p. (To have health is to not suffer from illness)	13.2	---	---
Health-Medical care (To have health, medical care is needed)	11.8	---	---

N = 68 for all items

As Table 44 shows, there were three cognems related to <aging-general decline>, which is another central element of the representation: <health-illness treatment and prevention>, <death-sadness> and <health-medical care>. There was no prevailing relationship type for <health-medical care> [$\chi 2$ (3, N = 56) = 2.73, p = .435], whereas for <death-sadness> the relationships with <aging-general decline> as a cause and with both elements interacting with each other were favored (39.1% each) [$\chi 2$ (3, N = 46) = 15.39, p = .002, w = .58]. For <health-illness treatment> and prevention the predominant relationship was also reciprocal influence (44.9%) [$\chi 2$ (3, N = 49) = 13.78, p = .003, w = .53].

Table 44. Cognem relationship proportions with <aging-general decline> (To age is to lose physical and mental capacities)

A - Element	Relations. %	Yates χ^2 (1)	*p*
Health-Illness t. p. (To have health is to not suffer from illness)	72.1	12.36	< .001
Death-Sadness (Death causes sadness)	67.6	7.78	= .005
Health-Medical care (To have health, medical care is needed)	66.2	6.48	= .011
Death-Fear (Death provokes fear)	60.3	2.48	= .115
Health-Well being (To be healthy is to feel well)	57.4	1.20	= .273
Family-Support (Family members must support each other)	54.4	.36	= .549
Death-End (A person's existence is over after death)	38.2	---	---
Family-Love (There must be love in a family)	36.8	---	---
Family-Parents (A family is formed by parents and children)	19.1	---	---

N = 68 for all items

The three relationships that were significant with the <aging-family> cognem were the ones related to the three elements of [family]: <family-love>, <family-support> and <family-parents> (see Table 45). For all three of them, the prevailing relationship was that of reciprocal influence with <aging-family>, at a 63.6% proportion for <family-love> [$\chi 2$ (3, N = 66) = 58.48, p = .001, w = .99], 54.5% for <family-support> [$\chi 2$ (3, N = 66) = 38.12, p = .001, w = .80] and 50% for <family-parents> [$\chi 2$ (3, N = 52) = 23.85, p = .001, w = .68].

Table 45. Cognem relationship proportions with <aging-family> (To age is to be together with the family)

A - Element	Relations. %	Yates χ^2 (1)	*p*
Family-Love (There must be love in a family)	97.1	58.36	<.001
Family-Support (Family members must support each other)	97.1	58.36	<.001
Family-Parents (A family is formed by parents and children)	76.5	18.02	< .001
Health-Well being (To be healthy is to feel well)	60.3	2.48	= .115
Death-Sadness (Death causes sadness)	48.5	---	---
Death-Fear (Death provokes fear)	41.2	---	---
Health-Medical care (To have health, medical care is needed)	29.4	---	---
Health-Illness t. p. (To have health is to not suffer from illness)	26.5	---	---
Death-End (A person's existence is over after death)	25.0	---	---

N = 68 for all items

Finally, as the results from Table 46 show, <health-medical care> was the only element with a significant relationship with <aging-health problems>. No specific relationship prevailed over others, though [$\chi 2$ (3, N = 47) = 4.32, p = .229].

Table 46. Cognem relationship proportions with <aging-health problems> (To age is to have health problems, illnesses)

Element	Relations. %	Yates χ^2 (1)	*p*
Health-Medical care (To have health, medical care is needed)	69.1	9.20	= .002
Death-Sadness (Death causes sadness)	60.3	2.48	= .115
Health-Illness t. p. (To have health is to not suffer from illness)	60.3	2.48	= .115
Family-Support (Family members must support each other)	57.4	1.20	= .273
Death-Fear (Death provokes fear)	55.9	.72	= .396
Health-Well being (To be healthy is to feel well)	52.9	.14	= .708
Family-Love (There must be love in a family)	35.3	---	---
Death-End (A person's existence is over after death)	29.4	---	---
Family-Parents (A family is formed by parents and children)	19.1	---	---

N = 68 for all items

Discussion

In general, the formulated hypotheses and expectations were supported by results. In terms of social implication, expectations were confirmed, as data show that there are higher implication rates for objects such as [health] and [family] in comparison with [aging] and [death]. It is pertinent to point out that one of the implication dimensions, direct social valuation, did not differentiate among objects; therefore, one might question its appropriateness as a measure, since it is unlikely that four objects with different characteristics are all highly implying at a given moment. As suggested, it might be more prone to social desirability or non-contrasting evaluations – an "everything is important" pattern. On the other hand, the frequency of communication measure might be a good alternative. It distinguished objects according to the hypotheses, providing coherent results, and appears to relate to the core of the social valuation conceptual dimension, according to Flament and Rouquette (2003): the stake value.

Concerning the characterization of single representation structures, the results provide a clearer picture of the structures of the involved representations and their relationships. It is pertinent to note that the centrality tests had a few surprising results. The results for [aging] are coherent, as elements such as <general decline> and <social exclusion>, related to losses, were identified as central, as was <family>. <New activities> and <health problems> were confirmed as peripheral elements. The status for <social exclusion> was different from the results obtained in Study 1-A, and the differences in sample composition and size are to be taken into account to explain that fluctuation in status. Our position is that the fact that this study had a considerably larger sample

and that <social exclusion> had the highest rejection rate serves as evidence to advise its characterization as a central element.

Two cognems that are often salient in interviews and free association tasks had their peripheral status confirmed. Such was the case for <wisdom> – which also had a peripheral status for the Italian sample in Study 1-A, though – and, more unexpectedly, <death>. Yet, their low rejection proportions leave little doubt that for the current sample they were peripheral elements. Additionally, the representation on [aging] that emerged from results is clearly normative, as <decline> and <exclusion> both present evidence of performing a normative role, probably linked to how badly or unpleasantly – yet typically – the aging process develops. The third element of the core, <family>, also has a double nature, defining [aging] as a process that leads the person back to his or her family, but also indicating how a – …positive? – [aging] course may go on.

The structures of [death], [family] and [health] were not thoroughly characterized, since only three items of each were selected for analysis. The main goal was not that of describing a structure as a system, but rather describing the statuses of specific items in order to be able to evaluate their relationships with [aging] items precisely. Nevertheless, only elements with a certain salience were chosen, based on Study 2 results from prototypical analysis. Concerning [death], <fear> and <sadness> had peripheral status, whereas <end of existence> was a mixed central element. It relates to a basic conception of [death] as the final stage of life. The simplicity of the representation that comes out of those data and the contents of elements is probably also related to a low personal identification and a low perceived possibility of action.

Elements on [health] were all peripheral, contingent aspects. It is an indication that perhaps that representation is not clearly structured, even if the object label is highly valued and implying. Such a result was not expected, as all three items (especially <well-being>) had a prominent position in Study 2 results. Some hypothetical explanations can be raised to frame those findings. It might be that [health] is what Flament (1987) called a non-autonomous representation dependent on another social representation or social thinking construct. A second possibility is that the structure of the representation, since referring to a more abstract object, is not clearly consensual, not providing a thoroughly shared reading grid, but only a label to organize knowledge matrix; in this sense, we are reminded of the similarity with Moliner and Martos' (1995) concept of the denotation function of some representation elements. A third possibility, finally, would be the existence of sub-groups determined by other sociopsychological variables, each one of them sharing distinguished representations, and therefore somewhat "blurring" a common description.

Finally, two cognems from [family] were confirmed as central. According to the young adults sample, <love> is an attribute that must or should exist for a group specimen to be qualified as a family, as it is a mixed central element. <Support> also had a mixed role. <Parents> was a peripheral element, which indicates that direct parent-child relationships are not the only ones to describe a family.

Moving on to the results on object-to-object relations, the general hypothesis for the forced association SCB task from the quasi-experiment was supported by results. There was a general pattern for higher activation of [health] and [death] connectors than for [family], especially when the whole set of SCB connectors or the Praxis and Description meta-schemes were taken into account; Attribution connectors did not display that pattern. Concerning the overall trend, the results are evidence that the perceived similarity of those objects with [aging] from Study 2 finds correspondence at the level of logical relationships activation. The effect size relative to the difference was small, which suggests that the effect probably would not be found in the case of closer distance rates.

Another effect also deserves attention. Concerning the analysis for the whole set of SCB connectors as well as for the Description meta-scheme there was a tendency of [family] being more activated when it was at the first position of the triplet, and the opposite trend was true for [health]. For the Attribution analysis, [health] was also predominantly activated in the *B* position while [family] was preferably activated at *A*. Praxis connectors were the only ones in which such triplet positioning preferences were not observed.

There are two possibilities to make sense of those results. The first one would be to explain those differences due to specificity of the contents associated with each object for a given group. If that is the case, then relationship directions are to be investigated through the meanings of social representations and their elements, and through a compatibility of inter-representation relations; some contents would "suit better" a certain direction than others. A second possibility would involve the identification of structural regularities managing the preference for one or other relationship direction, such as the structuring degree of each representation, the existence of a clear-cut core, or their valences.

Moreover, what does being in the *A* or *B* position imply? SCB meta-schemes Description and Praxis are symmetrical, but Attribution is not. For Attribution, most items take the "*A* has property *B*" format, which might suggest that *A* is the upper order component and *B* is the subordinate one. Even for the symmetrical meta-schemes, perhaps the way in which items are expressed might take such an understanding on the part of the subjects, favoring the activation of

compatible relationships. Still, could it be that there is a bias in items that leads people to interpret the *A* term as being hierarchically superior to the *B* term? Such interpretation is supported by Milland's (2001) results about the forced association SCB task, which shows that it obtains results that are compatible with the ones from standard SCB procedures – and in the SCB model it is usually considered that the *B* term is an aspect of *A*, which might be implicitly understood by research participants as some kind of subordination.

Even if those topics linked to the in-depth study of OtO coordination relations will not be developed in this work – which aims at contributing with a tested model for CtC coordination relations – they do present interesting departure points deserving of future research efforts.

Finally, the results provided a picture of the organization of the representational system at the level of inter-representation cognem-to-cognem relations. <Aging-social exclusion>, a central element, was mostly related to elements linked to [death]. <General decline> was connected to [death] and also two [health] elements. Completing the central core of [aging], <family> was associated with the three elements of the representation with the same name. For the peripheral elements, <aging-death> was connected to [death] elements, and <aging-health problems> was linked to <health-medical care>, whereas <aging-new activities> had relationships with one [family] and one [health] element. There were no statistically significant relationships for <aging-wisdom>. Among the types of relationships, reciprocal determination associations prevailed, as well as cases in which there was not a differentiated link type.

That organization indicates that there are four organization axes on the system composed by the four representations, when focusing on the relationships involving [aging]. For both <social exclusion> and <general decline>, there are connections with [death] that relate to <fear> and <sadness>. The <aging-death> peripheral element is also included in that pole. For <decline>, there is also a second group of relationships that underline its links to organic and mental functions, as they relate to [health] elements directed towards prevention of illnesses and medical care; it is as if those elements manage the operations done to deal with that decline. So the first two classes of relationships deal with the deadly side of [aging] and its emotional correlates and also with the organic bases and processes that are also linked to the first axis.

A third axis refers to the central element <aging-family>, linking it to the general conceptions about what a family is and should be. A fourth axis relates to a peripheral aspect of [aging], that of the possibilities of engaging in new activities, a somewhat positive outcome of the process. While supposedly also linked to a redefinition of work activities – as hypothesized in

Study 2 results -, and as a consequence related to other representations, data also indicate that this possibility is related to quality of family support and the possibility of feeling well.

Tentative dynamics of that system might involve the activation of relationship axes and the representation structures that contain them depending on the characteristics taken by a specimen of the aging process, as all of its central elements have at least partial normative nature – two of them are true adjunct elements and the other has a mixed profile. In the case of severe decline or prejudice from society, then the schemes related to health limitations and resources and/or the correlates of reactions that are typical of death might come into play, activating the axes related to losses. Family life is closely related to the understanding of what a family group has to be and how it should be, and changes in those concepts or in the quality of experiences in family when aging might affect the involved representations mutually. Finally, a redefinition of one's activities in old age is a peripheral - and thus conditional - event perceived positively, and may take place probably when family life provides good conditions for it and social and health losses are not incapacitating. In those cases, the engagement in new activities is related to well being as well.

Those connecting points among social representations might function like 'bridge' mechanisms through which different notions interfere with each other, managing information and bringing about change when conflicting information is resistant, at a cognem level. A hypothesis according to which activations or contradictions of those specific areas of contact are more likely to activate other representations or their cognems than other kinds of intervention directed to unconnected relationships can be advanced. If that hypothesis is confirmed, then it will constitute a relevant contribution for the understanding of social representation systems and their dynamics, which might also be useful for applied interests in strengthening or modifying beliefs and belief systems. Part IV will deal with research directed towards evaluating the plausibility of those inter-representation connection points within representational systems.

Part IV: Inter-representation cognem relations: preliminary evidence, theoretical model and empirical verification

Chapter 7: Context effects and inter-representation coordination activation

A coordination relation, first named by Flament and Rouquette (2003), implies an association between two social representations. In the knowledge model that we are employing (Chapter 2), the relations between knowledge units are formalized through the SCB model.

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 hyperconnector 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 a certain intensity, then it can be said that two social representations are coordinated. In this sense, existing OtO relationships (see Chapter 6) correspond to coordination relations between social representations. Although Fraissé (200) 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]. Study 3 presented another example of the study of OtO relationships, by characterizing the intensity of total and partial valences linking [aging] and other social representations within a same representational system.

However, there is much pertinent information that is necessary to characterize an inter-representation relationship that is not expressed 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, in the sense of Chapter 2 – 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 transform each representation or the relationship between them. In other words, the identification of inter-representation relations at the level of cognems would provide most valuable information.

In Study 3 we have asked participants to give their perceptions about the existence or non-existence of relations between cognems from different social representations, and in some cases we

had significant exploratory results that pointed to an identification of CtC relations. But is it possible to identify those relations empirically otherwise, in a more indirect way?

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 should be a correspondence in how much we think about something else that is linked to it.

This can be verified through empirical research. Total and partial SCB valences are measures of activation, i.e. relationship intensity, that are already established in the literature (Guimelli & Rouquette, 1992; Guimelli, 1995). As a consequence, the activation of the R2 cognem could be easily assessed. But how to manipulate the intensity with which people activate the R1 cognem?

Flament and Rouquette (2003) referred to context effects as circumstances that affect the salience – in other words, the activation – of social representations. It is already documented in the literature (Guimelli, 1995, 1996; Abric & Guimelli, 1998; Rouquette & Rateau, 1998) that certain characteristics of a situation – whether social practices or constraints in an immediate context – contribute for a 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; in other words, 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 (Study 4) 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.

Study 4

Method

Design

The results of Study 3 indicated that Italian undergraduates perceived a peripheral cognem from the social representation on [health], <health-medical care>, as being related to two cognems from the social representation on [aging]: <aging-health problems> - characterized in Study 3 as being a peripheral element - and <aging-general decline> - a central element. 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 be influenced by context salience effects, which makes it appropriate to our study. Central elements are usually stable and impervious to context effects (Guimelli, 1995; Lo Monaco *et al.*, 2007), and then would probably be not affected by the planned manipulation.

The social representation on [health] was then R1, and [aging] was R2. The study had two independent variables, constituting a 2 x 2 independent measures 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 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 in the Relativization one. Each participant provided responses for two experimental conditions, adding up to a sample size of 144 cases.

Instrument

A questionnaire in Italian language was employed for data collection. There were 4 versions of the questionnaire, as the orders of evaluation of the two R2 cognems presented in instrument were balanced.

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 an 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 (the full text in relative to the excerpts and instructions in Italian language is given in Appendix 9).

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 measure to be healthy. The coordinator's comments justified that belief through the striking advance of medicine and through an acquired habit of people of using its resources to ensure good health. Finally, he concluded by reaffirming that for most Italians and Europeans the specialized care provided by doctors and nurses are essential for the health of people. 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. It was justified by the project coordinator through the existence of a preventive health culture that makes of doctors and medical care resources to be employed only when something is wrong with the organism; people would prefer to adopt a healthy lifestyle than to recur to the services of health professionals. He then reaffirmed that for most Italians and Europeans, the care provided by doctors and nurses was not that important for good health. 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. They should justify their responses in 5 to 10 lines.

In the next two pages there were two forced association SCB tasks (Fraisse, 2000; Milland, 2001, and Study 3) 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 questioning task items (Moliner, 1994, 2001a) destined to assess the structural status of the three cognems, as a baseline check. Item text and response options were identical to the ones employed for those cognems in Study 3.

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 questioning 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 Study 3 and also stable across conditions. The four response options for the questioning 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 67.5% was adopted to differentiate between central and peripheral status, the same criterion that was adopted in Studies 1-A, 1-B and 3.

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 into 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, similarly to what was done in Study 3. Scheme activation was the dichotomous dependent variable for all analyses, taking values "No" ("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). Analysis consisted in the calculation of the effects and parameters of the saturated model with the already-mentioned Microsoft Excel-based program for the analysis of three-way tables (Sanchez-Peregrino, 2008). 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 is one single general hypothesis related to the effect of the Situational context variable. It is expected that the Emphasis condition will 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.

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.

It is also expected that there are no interaction effects linked to the R2 cognems. Since both of them have peripheral statuses, it is plausible that they share the same behavior in terms of inter-representation activation brought about by context salience.

Results

Structural characterization

The results for the questioning 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 $\chi 2$ (1, $N = 72$) =.093, $p = .761$].

The two R2 cognems had rejection proportions that were very close to the centrality cut-off point of 67.5%. <Aging-health problems> had 47 (65.3%) rejections responses, a proportion that was nearly identical in both situational context conditions [Yates $\chi 2$ (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 $\chi 2$ (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 practically 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 [$\chi 2$ (1, $N = 72$) = 48.94, $p < .001$, $V = .82$].

The response distribution relative to the full set of SCB connectors is presented in Table 47, while the results relative to the effects of the saturated model are given in Table 48. 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 47. 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 48. 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

Table 49 presents the results relative to the Description meta-scheme alone, and Table 50 reports the results of the log-linear model. 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 49. 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 50. 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 8 shows 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[14].

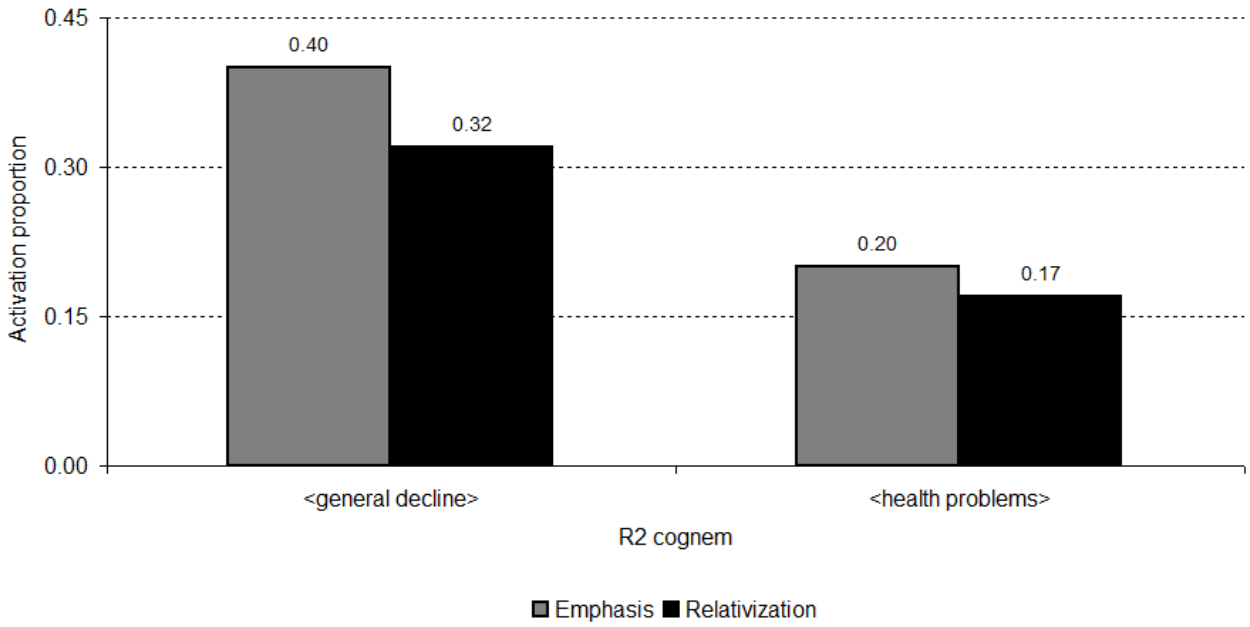

Figure 8. Activation proportions relative to each R2 cognem for the Description meta-scheme connectors, by situational context

Table 51 presents the results relative to the response distribution of Praxis connectors. The effects from the saturated log-linear model are given in Table 52.

[14] A first order log-linear interaction in which one of the involved variables is a dependent variable according to a study design is rouggly equivalent to a main effect in ANOVA; a main effect in log-linear analysis refers only to the univariate distribution of the variables.

Table 51. Contingency table containing the response distribution relative to the activation of the connectors from the Praxis meta-scheme

	Situational context				
	Emphasis		Relativization		
R2 cognem	No	Yes	No	Yes	Total
<general decline>	299	145	278	142	864
<health problems>	314	130	319	101	864
Total	613	275	597	243	1728
	888		840		

The only relevant effect consisted of the 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.

Table 52. Saturated log-linear model for the Praxis meta-scheme

Effect	Y^2	*df*	*p*
R2 cognem	.000	1	= 1.000
Activation	285.048	1	< .001
Situational context	1.334	1	= .248
R2 cogn. x Activation	8.659	1	= .003
R2 cogn. x Sit. cont.	.000	1	= 1.000
Activation x Sit. cont.	.856	1	= .354
R2 cog. x Act. x Sit. con.	2.296	1	= .130
Global	298.192	7	< .001

The results relative to the Attribution meta-scheme are presented in Tables 53 and 54. Once again, the only pertinent effect was the interaction between the R2 cognem variable and Activation.

Table 53. Contingency table containing the response distribution relative to the activation of the connectors from the Attribution meta-scheme

	Situational context				
	Emphasis		Relativization		
R2 cognem	No	Yes	No	Yes	Total
<general decline>	138	121	135	110	504
<health problems>	155	104	152	93	504
Total	293	225	287	203	1008
	518		490		

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.

Table 54. Saturated log-linear model for the Attribution meta-scheme

Effect	Y^2	*df*	*p*
R2 cognem	.000	1	= 1.000
Activation	23.008	1	< .001
Situational context	.778	1	= .378
R2 cogn. x Activation	4.698	1	= .030
R2 cogn. x Sit. cont.	.000	1	= 1.000
Activation x Sit. cont.	.416	1	= .519
R2 cog. x Act. x Sit. con.	.007	1	= .931
Global	28.907	7	< .001

Supplementary study

In order to verify if the results from Study 4 could be generalized to a case in which the manipulated element had different structural status, a supplementary study was carried out with identical design and instrument configurations, but with different cognems. The findings of the study will be only summarized here, so as to complement the assessment of the role of structural status in the proposed manipulation of R1. Full results can be found in the Appendix 10.

The sample had 68 psychology undergraduates comparable to the one from Study 4. There were 34 participants in each situational context condition. The three cognems that were included, based on Study 3 results on inter-representation cognem associations were <family-support> (R1 cognem), <aging-family life> and <aging-new activities (R2 cognems). In the case of this supplementary 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.

It was observed that the R1 cognem had a clear central role, with a rejection proportion in the questioning task of 89.7%. <Aging-family support> was also central, with a 76.5% proportion, and <aging-new activities> had peripheral status, with a rejection proportion of only 51.5%. There was no significant difference across situational context conditions for any of the three cognems.

The content analysis indicated that for the Emphasis condition 30 participants wrote on how important family is as a source of support, 3 others gave a balanced importance to family and friends, and one commented on societal changes and the main importance of friends. The reverse pattern was found for the Relativization condition (31 responses privileging the role of friends in support, 3 providing a balanced view and none giving higher importance to family), which accounted for a significant difference across situational context conditions [Yates $\chi 2$ (1, N = 68) = 48.940, $p < .001$, $V = .82$]. The discourse task did induce different activation contexts, then; the analysis served as a manipulation check.

However, when a log-linear analysis was conducted over the three way table crossing Situational context, R2 cognem and Activation for the whole set of SCB connectors, what was observed was that the higher or lower activation of the R1 cognem was neither associated with an interaction involving Situational context and Activation [Y^2 (1) = 1.530, $p = .216$], nor with a second-order interaction involving the three variables from the table [Y^2 (1) = .491, $p = .484$]. The only significant effect, which explained most of the global association, was the main effect related to Activation, that simply indicated that there was a minority of activation responses, at 37.7% [Y^2 (1) = 231.439, $p < .001$]. The results of this supplementary study point out that the manipulation of the situational context did not work to activate a second cognem connected to the one that underwent a context effect. Since the R1 cognem from Study 4 was a peripheral element while the one from the supplementary study had a central role, it is suggested that structural status might be an important variable to take into account to characterize inter-representation CtC activation.

Discussion

The results from Study 4 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, that 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 a 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) structural studies about inter-representation relations to date had identified element or object label intersections (Abric & Vergès, 1996), OtO relations (Fraissé, 2000) and themes that are common to two or more representations (Milland, 2001, 2002; Guimelli & Rouquette, 2004; Sarrica & Wachelke, 2010, in press). 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 (1996)'s study, 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.

Some hints for future research are given if we compare the results of Study 4, in which a peripheral element was manipulated, with the ones from the supplementary study, which had a central element as the R1 cognem. In the complementary study, 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 Study 4 is very small, indicating a subtle action of R1 activation over R2. It is documented in the literature (Guimelli, 1995; Lo Monaco *et al.,* 2007) that central elements are resistant to context effects. The case that the content of such kind of cognems is little affected by context might imply that its inertia is associated with a dormant connection with the other representation element that is connected to it, at least in the case of the more "spontaneous" activation paradigm that we employed. 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. When we say that the association might be dormant, we do not mean that it has low intensity – even if it might -, but simply that it is relatively stable across context salience variations.

It must be pointed out, though, that the results relative to the structural status of the R2 cognems only allow tentative interpretations, because the characterization of their structural status leaves considerable place to ambiguity in their classification. <Aging-general decline> was identified in Study 3 as being a central element, with a rejection proportion of 68.6%, above the adopted cut-off point of 67.5%. In Study 4 it had a close proportion that put it just behind that mark. This indicates that it is an element that stands on the border between centrality and a peripheral

status; it might be more suitably classified as a highly salient peripheral element. <Aging-health problems>, on the other hand, which had been classified as a peripheral element in Study 3 with 61.8% rejection, now had a close 65.3% one; which is agreeing in terms of its peripheral condition, but also somewhat close to the cut-off. It then seems wise to recommend the conduction of further studies with other representational systems, possibly including clear-cut central or peripheral elements, in order to make it possible to characterize the role of structural status with more precision.

Finally, if CtC inter-representations 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. In Chapter 8 we will detail a proposed model on inter-representation connections at the level of cognems and research that was aimed at testing its adequacy.

Chapter 8: A model for inter-representation cognem-to-cognem relations

There have been studies that identified some specific configurations of coordination relations, in the case of some intersection or coincidence involving the social object or cognem labels of different representations, what is called conjunction (Abric & Vergès, 1996; Guimelli & Rouquette, 2004; Flament & Rouquette, 2003). However, as commented in Chapter 3, if the identification of conjunction types is very useful in the sense that it presents evidence that some social representations depend on others or are mutually connected, with all its theoretical and application implications, it does not provide a model to explain how those conjunctions can occur. Additionally, there is another limitation: there is currently no way to explain the coordination of two disjoint social representation; the classification of conjunction types does not help to make sense of cases in which there is no conjunction, and they are many – probably most of the cases of social representation association.

Again, an inter-representation CtC model is a possible response to fill that theoretical blank. A model of relations involving more basic knowledge units should provide "knots" tying elements of different representations, whether there is some label involved or not. The aim of this chapter is to present the formulation of such a model, and then verify if it is useful with the support of empirical data.

Inter-representation connection points and bridge relations

In order to assess inter-representation cognem-to-cognem relations, we postulate the existence of a "zone" in the representational system that functions as a junction of two social representations. Such zone will be called inter-representation connection point, or more simply, connection point, from now on. We propose that this device is formed, minimally, by three components. Two of those components have already being defined when we exposed our conceptual model (Chapter 2). They are two cognems, one from the first representation (R1 cognem) and the other from the second one (R2 cognem).

Let us remind ourselves that each cognem is itself a configuration of a composite structure – the *A c B* triplet – linking two verbal signs through an SCB connector or hyperconnector; the first verbal sign is a label related to the social representation object, while the second one refers to an aspect of it. In this case, as mentioned in Chapter 2, we refer to a cognem as <object-CONNECTOR-*B* term>. If we sacrifice some precision, in order to simplify the operationalization

that we shall proceed to for the next studies, we can also assume that the connector in question refers to a vague link that associates the aspect with the social object, i.e., the aspect is a characteristic, quality or property of the social object. The cognem is simply written as <object-*B* term>. It is important to note that, since a connector is always at least implicit in a cognem, that every cognem, itself, expresses a relation between an object and its aspect.

The third component of the connection point is what we call inter-representation bridge relation. It is a connector, formalized through an SCB connector or hyperconnector, linking two cognems from different social representations. In other words, as each cognem is a relation in itself, an inter-representation bridge relation is nothing more than a "relation of relations". Figure 9 illustrates in a graphic scheme a connection point in a representational system, formed by two cognems from different representations and a bridge relation.

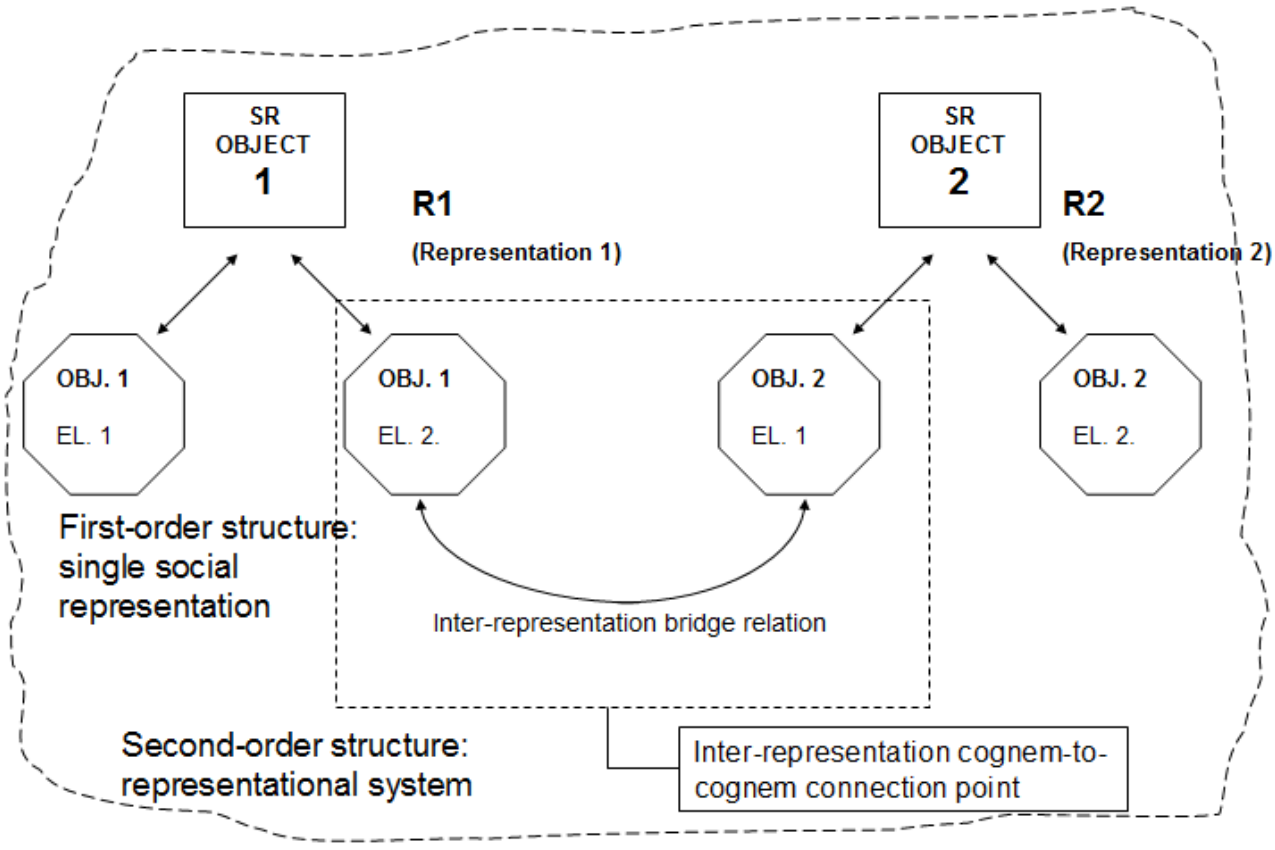

Figure 9. Illustration of an inter representation cognem-to-cognem relation through a connection point within a representational system.

According to the notation that we have been employed throughout the text, we propose that a connection point is written, for disambiguation, between braces ("{ }"). Inside the braces, both

cognems are included as well as a specified bridge connector or a hyphen to make it implicit. As a result, a generic connection point is represented as follows:

{<A_1-c_1-B_1>-BRIDGE-<A_2-c_2-B_2>}

Where A_1 and A_2 are, respectively, social object labels for a first and second social representation; c_1 and c_2 are connectors linking each aspect to a social object, B_1 and B_2 are aspects of social representations 1 and 2, and BRIDGE is a bridge relation uniting the cognems.

Another way to refer to a connection point would be:

{<R1 object-CONNECTOR$_1$-R1 aspect>-BRIDGE-<R2 object-CONNECTOR$_2$-R2 aspect>}

Or, if the within-representation connectors are implicit:

{<R1 object- R1 aspect>-BRIDGE-<R2 object- R2 aspect>}

Note that, if the bridge connector is one-way oriented (as most SCB connectors and hyperconnectors), then the above connection point refers to a single-direction relation, as in, for example, cognem from R1 is evaluated by the cognem from R2. If we want to consider both directions within a connection point, then each connection point must give the possibility of both directions. This can be done simply by adding the boolean operator "OR" and completing the connection point with the other-way relation, with the same connector. It is important to make it clear that both directions can be investigated independently and the valence of each one of them is independent of the other one. For a notation with implicit within-representation connectors, it would be:

{<R1 object- R1 aspect>-BRIDGE-<R2 object- R2 aspect> OR <R2 object- R2 aspect>-BRIDGE-<R1 object- R1 aspect>}

The bridge relations could also be set as being implicit, but it would probably make it difficult to make sense of the connection point. While this step usually does not compromise the understanding of a single cognem to a large extent, due to the fact that most cognems have either a semantic or evaluative component, or both (cf. Lheureux *et al.*, 2008), the imprecision of not

specifying a type of bridge would increase the ambiguity of a relation involving two relations that are not clearly set themselves, making the whole picture somewhat "cloudy". Although a {<cognem1>-<cognem2>} connection point is clearly legitimate – it is simply a less refined description with higher uncertainty – we find it less useful and will always work with bridge relations that are specified at the level of a connector or hyperconnector.

A further point that needs to be emphasized is that the understanding of a connection point as a relation between relations can also be seen as a special case of a composition involving two or more triplets, a mechanism that has been introduced already in Rouquette's (1994c) essay about relations involving cognems. In this sense, it is a tool that is transposed to a slightly different context – the cognems in our case designate portions of different representation structures – but its principles are already foreseen in the basic conceptual model.

But, if the formulation of inter-representation bridges is necessary to take into account the mutual implications of cognems from different social representations, how can we actually identify the existence or non-existence of a relation? To solve this problem, we will rely on the notion of cognem activation. We postulate that, if there is difference in activation of a bridge relation when one occurrence (a specimen) of a cognem from a connection point is confirmed or denied, then the connection with that particular bridge relation and those cognems is said to be relevant. If, on the other hand, the confirmation or denial of cognem content is not associated with a change in the bridge relation connecting to the second cognem, then the second cognem does not depend on the first one. If the manipulation the relation in the other direction – changing the validity of the cognem from the second representation – is also not followed by activation difference, then the bridge relation does not present much interest, as it does not designate a true coordination between social representations. Notice that this understanding of the coordination relation is more restrictive than the one that we exposed in the beginning of this chapter.

An example should help to make things clearer. If we have the following connection point: {<house-doors>-DEF-<comfort-temperature>}, we could translate it into a one-way inter-representation relation as follows: the existence of doors in a house (a possible "translation" of <house-doors> to common language) means the same thing as thermal comfort (<comfort-temperature>). Now imagine that we can measure the activation rate (valence) of two specific cases of that relation:

Relation 1: a house *with doors* means the same thing as thermal comfort: this relation is compatible with cognem content.

Relation 2: a house *without doors* means the same thing as thermal comfort: this relation denies cognem content.

If the valences of relation 1 and relation 2 do not differ, then our connection point has no real relevance; the house is defined by thermal comfort the same way in spite of the presence or absence of doors. <Comfort-temperature> might be related to [house] globally, or to another of its cognems. If, on the other hand, we observe for instance that one of them is higher than the other, then the association of the R2 cognem (<comfort-temperature>) becomes relevant to make sense of the R1 cognem, because its action, if not limited to, is at least directly targeted to the R1 cognem.

A clarification is necessary. The absence of valence differences when cognem content is confirmed or denied does not actually mean that there is no bridge relation. It simply does mean that the relation is not very "useful". For instance, if a cognem that has its content validity manipulated has a peripheral status, confirming or denying the relation might be ineffective to capture a relation, as it has a conditional nature. In that case, the size of the non-differentiated valence should be taken into account: a high value (ideally close to 1, although it is the research literature that may give guidelines to interpret valence size, as in Guimelli, 1995) implies the existence of a valid inter-representation cognem-to-cognem relation. But it is not possible to know if that relation is directly targeted at the manipulated cognem, or if it is a consequence of some other association. In addition, if every configuration of a cognem is tolerated in a bridge relation, then perhaps a most interesting relation is to be looked for elsewhere: that association might be under the control of other cognems from the two involved representations, as one cognem is actually independent from the other.

Therefore, the actual non-existence of an inter-representation relation is restricted to cases in which bridge relation valences are close to 0. Nonetheless, it is the situation in which one cognem from one representation is activated differently by content states linked to a cognem of another representation (whether having central or peripheral status) that bears interest to our perspective. It is this configuration that allows the identification of inter-representation cognem dependency – in other words, of true cognem coordination.

This gives us a taxonomy of three possible configurations linked to inter-representation bridge relations. The first one involves invalid relations: that is the case of very low relation valences. When a relation has higher valence that does not change across the modalities linked to content validity of the manipulated cognem, then we have valid relations that have low relevance as there is no dependency at the level of cognems; it has little explanatory power to make sense of the

association. Finally, when relations with fair valences differentiate across the modalities of the manipulated cognem, it can be said that the relations translate an association directly targeted between cognems: it is not only valid, but relevant in the sense that we have employed above.

It is important to remember that in the case of two-directional bridge relations, both should be investigated, and a relevant relation in one direction might help to understand the other one. Moreover, both cognems are passive of manipulation in terms of their content validity. Resuming our example, it means that, if we want a complete characterization of the connection point linking <house-doors> and <comfort-temperature> through a definition bridge relation, there should also be a verification of the inter-representation bridge relations when varying the content compatibility of <comfort-temperature>. In other words, how does the activation rate of DEF behave when we assess the connections between the "presence of doors in a house" and both "thermal comfort" and "thermal discomfort"? Overall, we have then eight relations to be assessed if we want a thorough characterization of a connection point – which might not always be the case: four relations including the two directions of a connector relation when manipulating the content validity of the first cognem while keeping the second one constant, and four others referring to the manipulation of the second cognem while the first one is constant.

A few additional complementary comments are pertinent. In a two-directional connection point, it might be that one is valid while the other is not, it might be that both are valid, that both are invalid, and so on. These possibilities are a consequence of the already mentioned independence of each direction of a bridge relation.

Finally, it is possible to generalize the above considerations to more complex connection points, e.g. containing more than two cognems and/or composite relations (in the sense defined by Rouquettte, 1994c). Yet, the more complex a connection point is, the more difficult it is to interpret the relations that it contains and their joint action. In the present effort we will only deal with minimal connection points, each with two cognems from different representations and two-directional bridge relations.

The previous paragraphs have defined the characteristics of inter-representation connection points from a conceptual point of view. But does that theoretical device still prove to be plausible – and useful – when employed to analyze empirical data? Studies 5-A and 5-B were carried out to verify the heuristic value of connection points and their empirical adequacy. Their aim was to verify if, for two given social representations from a same representational system (R1 and R2), the information consisting of denial or confirmation of content from one representation (R1) changes

the activation rate of basic cognitive schemes connectors from a cognem of the second representation (R2).

It is then a set of studies on inter-representation CtC relations, which makes use of the notion of inter-representation connection points to characterize cognem relations in terms of coordination. The effects of some pertinent structural variables are also assessed. Those are: structural status of the R2 cognem and order of terms in the bridge relation (i.e., connection points were taken into account two-directionally).

The two studies were conducted with the same sample: the same questionnaire included the manipulation for both. Studies 5-A and 5-B were experiments set to compare two connection points that shared a cognem related to the social representation on [aging]. The results from the CtC relationships section of Study 3 guided the selection of four connection points, each one involving two [aging] cognems and another cognem from a social representation from the same system ([family] or [health]). The two connection points of each study were selected so as to share the same [aging] cognem, which would make it possible to assess the effects of the same variation in content compatibility related to the cognem of [family] or [health] on the two relations related to [aging] elements.

The difference between the two studies is that each of them dealt with different connection points. Conducting two studies allowed for a better evaluation of the connection point device in terms of usefulness and plausibility. Each study is described separately, but there will be a single discussion section addressing both.

In both studies, the use of the term "R1" refers to the social representation of the connection point that is related to [aging], i.e., [health] (in Study 5-A) or [family] (in Study 5-B). "R2" is the term that designates the other involved representation, which is [aging] for both studies.

Study 5-A

Method

Design

Study 5-A assessed two connection points that contained <health-medical care> as a manipulated element. The participants from Study 3 indicated that two [aging] cognems are somehow associated with that element from [health]: <aging-general decline> and <aging-health problems>. Note that, according to the results from Study 3 and 4, <health-medical care> was

characterized as having a peripheral status in the social representation on [health], while <aging-general decline> and <aging-health problems> had high-salience peripheral status within [aging].

In Study 5-A, there are then two generic two-directional connection points to be assessed:

{<health-medical care>-BRIDGE-<aging-decline> OR <aging-decline>-BRIDGE-<health-medical care>};
and
{<health-medical care>-BRIDGE-<aging-health problems> OR <aging-health problems>-BRIDGE-<health-medical care>}

We did not proceed to a complete characterization of the connection points, as only the content validity of <health-medical care> was manipulated. The number of relations to be effectively assessed is then four (two directions of two cognem points in which only one of the component cognems has its content compatibility manipulated) times the number of assessed connectors. In the present case, we will evaluate two hyperconnectors, as will be detailed further.

The study had three independent variables, composing a 2 x 2 x 2 independent measures design. The first independent variable (R2 cognem in the connection point) consisted of the distinction between the two connection points that were evaluated, differentiated by the R2 cognem included in each one of them. Modality 1 involved the connection point with <aging-decline>, and modality 2 referred to the connection point with <aging-health problems>.

The second independent variable was R1 cognem content compatibility. It referred to the compatibility of content of a specimen of a social object with the R1 cognem from the connection point. Modality 1 was called congruence, the condition which confirmed the content of <health-medical care>, i.e., which in common language can be translated as "to undergo medical health care". Modality 2 involved the denial of R1 content: "*not* to undergo medical health care", and was labeled incongruence condition.

The third independent variable is the order of the R1 and R2 cognems from the connection point in the triplet. Modality 1 has the R2 cognem (the one related to [aging]) as the *B* term in the triplet, and the R1 cognem in the *A* position, while modality 2 inverted their orders.

There were two dependent variables, taken into account separately. Both were hyperconnectors, each grouping two connectors from the basic cognitive schemes model. Therefore, we did not employ the traditional meta-scheme measures. Rather, we tried to measure the intensity of the relations linked to the two components identified by Lheureux et al.'s (2008) as marking the typical roles of social representation elements: semantic and evaluative. Four connectors from the Attribution meta-scheme were taken as measures for those hyperconnectors. The semantic

component was here operationalized as the grouping of two connectors that refer to permanent or frequent characteristics of the *A* term in the triplet: CAR (*A* is always characterized by *B*) and FRE (*A* is often characterized by *B*). The semantic hyperconnector will be henceforth identified as SEMA. It is pertinent to point out that it is possible to approximate SEMA of a measure of symbolic value; in social representations research, high symbolic value has traditionally been taken as evidence of the central status of a cognem (Moliner, 1994; Wachelke, 2008).

The evaluative hyperconnector, which we will call EVAL to distinguish it from the EVA operator, is an aggregate of connectors NOR (*A* must have the quality of *B*) and EVA (*B* evaluates *A*).

The number of cases for each of the 8 experimental conditions was set as 35. Table 55 presents the experimental design distributing those cases through the crossings of the three independent variables.

Table 55. Research design for Study 5-A

R1 cognem: <health-medical care>	R2 cognem (connection point)			
	<aging-general decline>		<aging-health problems>	
	Order in triplet		Order in triplet	
R1 cognem content compatibility	[aging] as A	[aging] as B	[aging] as A	[aging] as B
Congruence	35	35	35	35
Incongruence	35	35	35	35

Participants

A total of 140 undergraduates from the University of Padua composed the study sample. The majority of them, 96 (68.6%) were women. Participants' ages ranged from 19 to 29 years old, with a mean of 22.96 years (SD = 2.73) and a median of 23 years. Each participant provided responses for two experimental conditions, which adds up to the total sample size (N = 280).

Instrument

A questionnaire in Italian language was employed for data collection. There were 8 versions of the questionnaire, each one containing two pages related to Study 5-A and two others related to Study 5-B, with balanced presentation orders. Each questionnaire section related to Study 5-A

contained one initial instruction presenting one condition of the R1 cognem content compatibility variable and relations with the occurrence related to the R1 cognem including each of the two R2 cognems, one at a time. Importantly, each R2 cognem was evaluated in a determined position in the triplet, and the other R2 cognem present in the questionnaire would be evaluated with the other triplet order. The presentation order of relation evaluations for the two R2 cognems was also systematically balanced across questionnaire versions.

The questionnaire for Study 5-A began by presenting a specimen that was either congruent or incongruent with the content of the cognem <health-medical care>, depending on the experimental condition that was taken into account. The congruence condition was presented with the following statement: “Imagine a person – Mario – who is healthy and goes often to the doctor to undergo medical checks and care”, while the incogruence condition was introduced by: “Imagine a person – Mario – who is healthy and almost never goes to the doctor to undergo medical checks and care”.

That instruction was followed by two questions that worked as manipulation checks to assess if participants had understood the proposed situation and perceived the situation differently across manipulation conditions. The first question was similar to a questioning (MEC) task. It asked participants to complete the following statement in a way that best matched their opinion: “to do like Mario, and to undergo / not to undergo medical care..” Only one modality was included in the question, according to the instructions contained in the questionnaire. There were four possible responses, among which one should be chosen: a) it is a very typical way of taking care of one's health; b) it is a non typical way of taking care of one's health; c) it is not a way of taking care of one's health, but it seems so; and d) it is not a typical way of taking care of one's health and it does not seem so. The first two responses can be merged and account for an acceptance response in a MEC task, while the two last ones refer to a rejection pattern.

The second manipulation check question asked participants to judge the specimen. To do so, at first it proposed that it was effectively taken as an element of the social object, and then participants provided responses about how good or bad the element was. In the present case, participants had to choose one response among three options to complete this statement: “assuming that undergoing / not undergoing medical care is a way of taking care of one's health” (again, only one modality was present in each questionnaire). Response options were a) the care is effective; b) the care is ineffective; and c) the care is neither good, nor bad. Those options correspond to evaluations of the specimen as being respectively a good, a bad and a neutral occurrence of the social object.

For the main task of the questionnaire, participants read a small text that informed them about the existence of studies that had identified the existence of a relationship between "undergoing medical care" (or "not undergoing medical care" in the other content compatibility condition) and one of the two R2 cognems from [aging]. <Aging-general decline> was expressed in common language as "loss of capacities in old age", and <aging-health problems> as "illnesses in old age".

Following that small text, participants had to indicate if four relations involving the specimen related to <health-medical care> and the R2 cognems were valid or not. This was done through a list containing four forced association SCB items, one for each of the connectors that would later compose the dependent variables: CAR, FRE, NOR and EVA. The statements were constructed in a way that the *A* term in the triplet was one expression relative to one cognem in the connection point, and the *B* term was the expression related to the other one. Through the formulation of expressions that summarized the meanings of cognems, we have employed the SCB items to assess CtC inter-representation relations.

Each questionnaire contained two relation sets with four items to be evaluated by participants, each set being preceded by a small text that referred to the two terms already in the order with which they would be evaluated in the triplet. The second relation set presented the R1-related specimen in a triplet order different from the one it had occupied in the first set.

The translated example text for the four relations in the condition combining content congruence, the [aging] term in the *B* position of the triplet and assessing <aging-general decline> as the R2 cognems is:

CAR: to undergo medical care is always characterized by the loss of capacities in old age;

FRE: to undergo medical care is often characterized by the loss of capacities in old age;

NOR: to undergo medical care must have the quality of the loss of capacities in old age;

EVA: The loss of capacities in old age evaluates undergoing medical care.

To obtain the item text for the other conditions, it is only necessary to replace the terms in italics by the other expressions relative to the cognems included in the connection points in a way that is grammatically correct and compatible with the research design presented in Table 55.

For each item, participants had four response options: "YES" (the relation was judged as certainly true or possible), "MAYBE" (maybe there was a relation), "NO" (the relation was not true) and "?" (the participant did not know if there was a relation or not, or could not make sense of the expressed relation). The "maybe" option is not usually employed in SCB tasks, but we chose to include it as a resource that would add more subtlety for the recognition of connector activations;

since our expressions were more complex than the common terms employed in standard SCB tasks, we figured out that it would be less likely that participants would recognize a clear-cut relation with the most complex statements. Yet, the recognition of likely or possible activations was considered pertinent to signal trends for relation activation, as it also represented differentiation with clear non-recognition patterns such as negative responses (when the relation was judged as being untrue or non possible) and cases in which the relation with the proposed terms did not make sense or the ones about which the participant did not hold a personal position.

Finally, there were two questioning items evaluating the structural status of <aging-general decline> and <aging-health problems>, and two items asking participants about the affective loading of those cognems. Those two sets of questions were set in the questionnaire to check if the structural statuses for those cognems were the same as the ones observed in Study 3. The instructions and response modalities for those items were identical to the ones employed in Study 1-A, 1-B, 3 and 4.

Procedure

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

Data analysis

Chi square tests were employed to compare the content compatibility conditions and check if they were perceived differently by participants in terms of the adapted questioning tasks in the beginning of the questionnaire. The four response options for the questioning item were dichotomized so as to reflect acceptance and rejection of the social object reading grill, similarly to classical questioning procedures. In addition, we adopted the cut-off proportion of 67.5% in rejection responses to differentiate between central and peripheral status, the same criterion that was adopted in Studies 1-A, 1-B, 3 and 4.

Similarly, t-tests were conducted to compare the affective loadings of the R1-related specimens. Positive responses were coded 1, negative responses were coded -1 and neutral ones were coded 0, and the resulting variable was treated as being continuous.

The questioning items and affective loading items for the [aging] items only went through frequency analysis of acceptance and rejection responses – options were also dichotomized. Once

again, the proportion of 67.5% was adopted as a cut-off point for rejection responses to characterize central status.

Concerning the dependent variables of interest (SEMA and EVAL valences), responses were dichotomized into activation (merge of "yes" and "maybe" responses) and non-activation (grouping of "no" and "?" responses). After that, chi square tests crossing the two connectors from each hyperconnector were conducted in order to measure their association.

Log-linear analyses (saturated model) were carried out separately for each dependent variable, based on two four-way contingency table crossing the three independent variables and each of the dependent variables. Each four-way table contained a total of 560 cases (8 conditions x 35 cases per condition x 2 connectors). The log-linear analyses were conducted with the aid of BMDP software.

Hypotheses and expectations

Concerning the manipulation check, it was expected that, in spite of the peripheral status of <health-medical care>, the two conditions would be perceived differently, if not regarding the proportion of rejection responses of the questioning item, at least in terms of affective loadings; the condition congruent with the element should be perceived as more positive than the incongruent condition. Nevertheless, there might also be differences in rejection proportions, even if it is not expected that any modality has results of rejection proportions higher than 67.5%, as the element in question has been characterized in Study 3 as being peripheral. The results related to the characterization of the structural status of the [aging] elements were expected to be similar to the ones from Study 3 and 4: <aging-general decline> and <aging-health problems> being identified as peripheral negative elements, even if possibly close to the centrality cut-off point.

Concerning the main results involving the independent and dependent variables, there was a single general hypothesis to guide the interpretation of our results. It consists of a higher activation of the measured semantic and evaluative relations in the case of congruence of information with the R1 cognem of interest, in comparison with incongruence conditions. It can be written as:

General hypothesis: the valences associated with congruence conditions will be higher than the ones related to incongruence conditions.

However, there are many effects that need to be addressed in order to make sense of the results. One first aspect that needs to be taken into account is the difference in R2 cognems; while it is expected that both have similar structural status – both should be peripheral elements - it might be

that semantic and evaluative relations do not affect both the same way, as they have content particularities. The same goes for the triplet order variable. As evidenced by the results of Study 3, some relations are stronger when the triplet terms assume one specific position in the triplet. This should also happen in the present case, and that is why the triplet order variable was added to the study. Once again, we do not have precise hypotheses of the directions of those effects, though, and have limited ourselves to a careful interpretation of the outcome.

Finally, it derives from those comments that also some higher order interactions involving specific cognems and triplet positions were likely to occur, with joint effects of connection point, content compatibility and triplet order. They were interpreted carefully, although we did not have specific predictions.

Overall, it is important to make it clear that the main interest for the interpretation of the analyses lied in the first-order interaction involving R1 cognem content compatibility and activation (the dependent variable). Special attention was also given to the interpretation of higher-order interactions that also contained the content compatibility variable.

Results

Baseline characterization and manipulation checks

There was an observed difference in the rejection proportions linked to the specimen related to the manipulated R1 cognem. The congruence condition had a rejection proportion of only 38.6%, while the incongruence one caused 60% of rejection. The contingency table chi square that compared the results of the questioning task related to the specimen linked to the manipulated R1 cognem was significant [Yates $\chi 2$ (1, N = 140) = 5.601, p = .018, V = .21]. It is evidence that the manipulation was effective in denying the content of the <health-medical care> cognem; if that difference had been non significant, then it would mean that both specimen configurations would not be incompatible. The proportion associated with the incongruence condition was fairly high, but still did not characterize a central status for that element according to the cut-off point of 67.5%.

The t-test to compare the affective loadings of the two specimens was also significant, indicating a strong effect [t(138) = 5.608, p < .001, d = .95]. The congruence modality had a positive connotation (M = .50, SD = .53), while the incongruence one was perceived slightly negatively (M = -.07, SD = .67).

The proportions of rejection responses of the questioning tasks for the two R2 cognems showed that none of them performed a central role on the social representation. For <aging- health problems> there was a proportion of 60% of rejection responses, which was compatible with the peripheral status identified in Study 3. There were no differences between the two R1 cognem content compatibility conditions [Yates $\chi 2$ (1, N = 140) = 2.411, p = .121]. The cognem had a negative connotation (M = .46, SD = .74) which did not vary across the two conditions [t(138) = 0, p = 1].

On the other hand, <aging-general decline> had a rejection proportion of only 65%. While it is close to the 68.6% observed in Study 3, it did not qualify the cognem to a central role in the social representation according to the cut-off point that we adopted, just as was observed in Study 4. In our sample, it suits better the role of a highly salient peripheral element. There were no differences between content compatibility conditions [Yates $\chi 2$ (1, N = 140) = .126, p = .723]. In terms of affective connotation, the cognem had a very negative loading (M = -.66, SD = .67), which also did not differ between conditions [t(138) - .761, p = .448].

Overall, baseline and manipulation check results indicate that the cognems had structural status characterizations similar to the ones observed in Studies 3 and 4, and that the manipulation was effective in proposing a situation that contradicted the content of the R1 cognem.

Hyperconnector activations

The SEMA hyperconnector had a significant association between its connectors [Yates $\chi 2$ (1, N = 280) = 45.890, p < .001, V = .41]. About half of the 200 cases that did not have the activation of CAR were associated with the activation of the FRE connector (51%), indicating a balanced split. But 95% of the 80 cases with CAR activation also activated FRE.

There was also a significant association between EVAL connectors, but it was weaker [Yates $\chi 2$ (1, N = 280) = 12.037, p = .001, V = .22]. Of the 222 cases of non-activation of the NOR connector, 62.6% also did not activate EVA. Among the 58 cases who did activate NOR, 63.8% indicated the existence of an EVA relation.

The results for the log-linear analysis relative to SEMA connectors are presented in Tables 56 and 57. As indicated in Table 57, the global effect was significant, and can be explained mostly by a single effect, a first-order interaction between the connection point variable and activation, that means simply that across all R1 content compatibility and triplet order conditions, the relations

involving <aging-health problems> had a higher proportion (54.6%, $z = 4.05$, $p < .001$) than the ones with <aging-general decline> (37.5%).

Table 56. Contingency table containing the results of Study 5-A relative to the activation of SEMA connectors

R1 cognem: <health-medical care>	R2 cognem (connection point)							
	<aging-general decline>				<aging-health problems>			
	Order in triplet				Order in triplet			
	[aging] as A		[aging] as B		[aging] as A		[aging] as B	
R1 cognem content compatibility	NO	YES	NO	YES	NO	YES	NO	YES
Congruence	44	26	43	27	21	49	35	35
Incongruence	42	28	46	24	36	34	35	35

It is more important to point out that concerning the SEMA hyperconnector, there were not significant effects including the R1 cognem compatibility variable. This means that the semantic relations that were assessed in both connection points were not directly coordinated with the manipulated [health] cognem; the activation intensity of those relations did not depend on that cognem. Still, even if not directly depending on R1 cognem-related variations, the semantic relations are valid, in the sense defined previously, especially concerning the connection point with <aging-health problems>: in that case, the proportion activations range from 48.6% to 70%.

Table 57. Saturated log-linear model for SEMA connectors

Effect	Y^2	*df*	*p*
R1 cognem compatibility	.00	1	= 1.000
R2 cognem	.00	1	= 1.000
Triplet order	.00	1	= 1.000
Activation	3.41	1	= .065
R1comp x R2cog	.05	1	= .816
R1comp x Tr.ord	.01	1	= .938
R1comp x Act.	1.87	1	= .171
R2cog x Tr.ord.	.05	1	= .816
R2cog x Act.	16.51	1	< .001
Tr.ord x Act.	1.87	1	= .171
R1comp x R2cog x Tr.ord	.07	1	= .790
R1comp x R2cog x Act.	1.40	1	= .237
R1comp x Tr.ord x Act.	.77	1	= .379
R2cog x Tr.ord x Act.	.71	1	= .401
R1comp x R2cog x Tr.or x Act.	2.99	1	= .084
Global	29.36	15	= .017

On the other hand, EVAL connectors had two effects that indicate the existence of a coordination between the R1 and R2 cognems of both connection points (see Tables 58 and 59). There were two significant effects. The main effect meant that activation responses were a minority, when compared to non-activation ones (31.8%, z = -8.43, p < .001).

Table 58. Contingency table containing the results of Study 5-A relative to the activation of EVAL connectors

R1 cognem: <health-medical care>	R2 cognem (connection point)							
	<aging-general decline>				<aging-health problems>			
	Order in triplet				Order in triplet			
	[aging] as A		[aging] as B		[aging] as A		[aging] as B	
R1 cognem content compatibility	NO	YES	NO	YES	NO	YES	NO	YES
Congruence	44	26	45	25	36	34	46	24
Incongruence	54	16	56	14	52	18	49	21

The most important effect is the first-order interaction between R1 cognem content compatibility and activation. It indicates that there is a general trend of higher activation proportions in congruence conditions (38.9%, z = 3.57, p < .001) than in incongruence ones (24.6%). This result is compatible with our general hypothesis, and we have thus identified the existence of an evaluative coordination at the level of cognems, for both connection points. The intensity of the associated relations is dependent on the compatibility of a specimen with the [health] cognem of interest.

Table 59. Saturated log-linear model for EVAL connectors

Effect	Y^2	*df*	*p*
R1 cognem compatibility	.00	1	= 1.000
R2 cognem	.00	1	= 1.000
Triplet order	.00	1	= 1.000
Activation	74.93	1	< .001
R1comp x R2cog	.05	1	= .826
R1comp x Tr.ord	.02	1	= .938
R1comp x Act.	13.08	1	< .001
R2cog x Tr.ord.	.00	1	= 1.000
R2cog x Act.	2.12	1	= .145
Tr.ord x Act.	.83	1	= .362
R1comp x R2cog x Tr.ord	.01	1	= .914
R1comp x R2cog x Act.	.13	1	= .716
R1comp x Tr.ord x Act.	1.01	1	= .316
R2cog x Tr.ord x Act.	.12	1	= .726
R1comp x R2cog x Tr.or x Act.	1.48	1	= .224
Global	93.62	15	< .001

Study 5-B

Method

Design

Similarly to Study 5-A, Study 5-B assessed two connection points; the difference lied in the cognems involved. The manipulated element was <family-support>, a central element from the social representation on [family] according to the results from Study 3. The two [aging] cognems, each from a separate connection point, were <aging-family life> (central status) and <aging-new activities> (peripheral status). The two generic two-directional connection points to be assessed are:

{<family-support>-BRIDGE-<aging-family life> OR <aging-family life>-BRIDGE-<family-support>};
and
{<family-support>-BRIDGE-<aging-new activities> OR <aging-new activities>-BRIDGE-<family-support>}

Just as in Study 5-A, there was not a a complete characterization of the connection points; only the content validity of <family-support> was manipulated. The study had three independent variables, composing a 2 x 2 x 2 independent measures design, with the same independent variables from Study 5-A: R2 cognem in the connection point, R1 cognem content compatibility and triplet order.

Concerning the R2 cognem variable, the first modality involved the connection point with <aging-family life>, and the second one dealt with <aging-new activities>. As for R1 cognem content compatibility, the content of a specimen related to <family-support> was converted to common language in a way that the congruence modality was expressed as "support in the family" and the incongruence modality was represented as "lack of support in the family".

The two dependent variables were the relations directed to semantic (SEMA) and evaluative (EVAL) relations, formed by the same connectors mentioned in Study 5-A.

The number of cases for each of the experimental conditions was also set as 35. Table 60 presents the experimental design for Study 5-B.

Table 60. Research design for Study 5-B

R1 cognem: <family-support>	R2 cognem (connection point)			
	<aging-family life>		<aging-new activities>	
	Order in triplet		Order in triplet	
R1 cognem content compatibility	[aging] as A	[aging] as B	[aging] as A	[aging] as B
Congruence	35	35	35	35
Incongruence	35	35	35	35

Participants

The same participants from Study 5-A took part on Study 5-B. Each participant also provided responses for two experimental conditions, adding up to the total sample size (N = 280).

Instrument

Other than the tasks and questions related to Study 5-A, the questionnaire also contained similar ones for Study 5-B. As already mentioned, the presentation order for the set of pages related to each of the studies was balanced. The task types, structure and order for Study 5-B was exactly the same as the one employed for Study 5-A; the differences were restricted to the cognems and connection points that were assessed, including instructions.

The congruence condition was presented with the following statement: "Imagine a family – the Trevisan – whose members always support each other", while the incogruence condition was introduced by: "Imagine a family – the Trevisan – whose members almost never support each other".

The questioning task manipulation check asked participants to complete the following statement in a way that best matched their perceptions: “In your opinion, the Trevisan...” There were four possible responses, among which one should be chosen: a) are a very typical family; b) are a non typical family; c) are not a true family, but they resemble so; and d) are not a true family, and they do not resemble so.

The affective loading manipulation asked participants to complete the following statement: “one can say that the Trevisan family” with one of three response options: a) is an admirable family; b) is a detestable family; c) is a family that is neither good, nor bad.

For the main task of the questionnaire, participants read a small text that informed them about the existence of studies that had identified the existence of a relationship between “family support” (or “lack of family support” in the other content compatibility condition) and one of the two R2 cognems from [aging]. <Aging-family life> was expressed in common language as “family relations in old age”, and <aging-new activities> as “new activities in old age”. The format and structure of the relation-evaluation tasks were identical to the ones employed in Study 5-A.

Procedure

Since Study 5-B and Study 5-A had the same data collection, the procedure to administer questionnaires was identical.

Data analysis

All the steps taken to analyze the data relative to Study 5-A were followed the same way in Study 5-B.

Hypotheses and expectations

The same expectations and general hypothesis from Study 5-A were adopted for Study 5-B. We reckon that the manipulated R1 cognem has a central status (while in Study 5-A it was a peripheral cognem), but we chose to take that information into account for interpretation and not to formulate precise hypotheses. Just as Study 5-A, in Study 5-B a general hypothesis predicting a significant first-order interaction involving R1 cognem content compatibility and activation, also open to higher-order interactions that also contained the content compatibility variable.

Results

Baseline characterization and manipulation checks

As in Study 5-A, there was also an observed difference in the rejection proportions linked to the specimen related to the manipulated R1 cognem. The congruence condition had a rejection proportion of only 11.4%, while the incongruence one had 41.4%, a significant difference [Yates $\chi 2$ (1, N = 140) = 14.694, $p < .001$, V = .34]. Even if that difference was identified, which indicates some success in denying the content of the <family-support> cognem, it must be noted that the rejection proportion was far from the cut-off point in the incongruence condition, which would support the characterization of that element as a peripheral one.

However, the t-test to compare the affective loadings of the two specimens pointed out the existence of a very strong effect [t(138) = 11.074, $p < .001$, d = 1.88]. The congruence modality had a positive connotation (M = .69, SD = .47), while the incongruence one was judged negatively (M = -.24, SD = .52).

The <aging-family life> cognem had a clear-cut central status, with a rejection proportion of 81.4% showing a small difference between the two R1 cognem content compatibility conditions [Yates $\chi 2$ (1, N = 140) = 3.826, p = .05, V = .184]: the rejection proportion was 88.6% in the congruence condition and 74.3% in incongruence. Still, in spite of this variation, the proportions for both conditions are higher than the adopted 67.5% cut-off point. The cognem had a strong positive connotation (M = .76, SD = .52) that not did differ significantly in both conditions [t(138) = .973, p = .332].

<Aging-new activities> had a peripheral profile, with a rejection proportion of 62.1%. There were no differences across content compatibility conditions [Yates $\chi 2$ (1, N = 140) = 1.093, p = .296]. Just as <aging-family life>, it had a very positive connotation (M = .79, SD = .53), not differing between conditions [t(138) 1.593, p = .114].

Also for this study, the results relative to baseline and manipulation check results indicate similar structural status for the cognems in comparison with Studies 3 and 4, and the success of the manipulation in varying the compatibility with R1 cognem, especially in what concerns its affective component.

Hyperconnector activations

Also in this study the SEMA hyperconnector had a significant association between its connectors [Yates $\chi 2$ (1, N = 280) = 60.908, $p < .001$, $V = .47$]. Results were very similar to the ones from Study 5-A: 168 cases of non-activation of CAR did activate the FRE connector (50.6%), and 95.5% of the 112 cases with CAR activation also activated FRE.

The same pattern was found for EVAL connectors, as the association between connectors was significant [Yates $\chi 2$ (1, N = 280) = 16.236, $p < .001$, $V = .25$]. A proportion of 53.7% of the 162 cases of non-activation of the NOR connector did not activate EVA either. Among the 118 casese with positive responses to NOR, 71.2% also activated EVA.

Table 61 presents the distribution of responses relative to SEMA connectors and Table 62 reports the results related to the log-linear analysis. There were two significant effects, other than the global one. The first-order interaction between R1 content compatibility and Activation is significant, but the existence of a significant third-order interaction directs the interpretation of our results. We then proceeded to two separate three-way table log-linear analysis, one per connection point, in order to make sense of our results.

Table 61. Contingency table containing the results of Study 5-B relative to the activation of SEMA connectors

R1 cognem: <family-support>	R2 cognem (connection point)							
	<aging-family relations>				<aging-new activities>			
	Order in triplet				Order in triplet			
	[aging] as A		[aging] as B		[aging] as A		[aging] as B	
R1 cognem content compatibility	NO	YES	NO	YES	NO	YES	NO	YES
Congruence	27	43	13	57	17	53	37	33
Incongruence	39	31	42	28	40	30	41	29

The three-way analyses for each connection point are presented in Table 63. The log-linear analysis for the three-way table formed by the results relative to <aging-family life> had a significant global effect, a significant main effect (Activation) and two interactions. Although the first-order interaction between R1 cognem content compatibility and Activation was significant, our main interest lied in the second-order interaction involving all variables (see Figure 9). Its interpretation suggests that the difference between the content compatibility conditions is stronger when <aging-family relations> is the second term in the triplet, i.e. when the relation involves family life in old age as a characteristic, a descriptor of the occurrence of support in a family group (z = 2.25, $p < .025$). The relation for that connection point is more strongly linked to a dependency

on the R1-related specimen than in the cases in which family support or lack thereof is a characteristic of family life in old age. Then, the first sense is probably the preferred sense of the relation.

Table 62. Saturated log-linear model for SEMA connectors

Effect	Y^2	*df*	*p*
R1 cognem compatibility	.00	1	= 1.000
R2 cognem	.00	1	= 1.000
Triplet order	.00	1	= 1.000
Activation	4.06	1	= .040
R1comp x R2cog	.09	1	= .770
R1comp x Tr.ord	.04	1	= .834
R1comp x Act.	33.26	1	< .001
R2cog x Tr.ord.	.00	1	= .965
R2cog x Act.	1.48	1	= .224
Tr.ord x Act.	.75	1	= .385
R1comp x R2cog x Tr.ord	.39	1	= .534
R1comp x R2cog x Act.	1.51	1	= .218
R1comp x Tr.ord x Act.	.01	1	= .906
R2cog x Tr.ord x Act.	7.59	1	= .006
R1comp x R2cog x Tr.or x Act.	10.80	1	= .001
Global	59.48	15	< .001

The analysis for <aging-new activities> had a significant global effect and three significant interactions, including a R1 content compatibility and Activation and Triplet order x Activation. Once again, it is the three-way interaction that guides our interpretation (see Figure 10).

Table 63. Saturated log-linear models for the separate three-way tables involving the two connection points, in terms of SEMA connectors

	<aging-family life>			<aging-new activities>		
Effect	Y^2	*df*	*p*	Y^2	*df*	*p*
R1 cognem compatibility	.00	1	= 1.000	.00	1	= 1.000
Triplet order	.00	1	= 1.000	.00	1	= 1.000
Activation	5.10	1	= .024	.35	1	= .553
R1comp x Tr.ord	.16	1	= .687	.24	1	= .625
R1comp x Act.	24.65	1	< .001	10.58	1	= .001
Tr.ord x Act.	1.90	1	= .168	6.48	1	= .011
R1comp x Tr.ord x Act.	5.19	1	= .023	5.63	1	= .017
Global	36.67	7	< .001	22.81	7	= .002

The interaction indicates that the difference in activation between the congruence and incongruence conditions is much stronger when <aging-new activities> is the first term in the triplet ($z = 2.35$, $p < .025$). The pertinent connection point is then better expressed as a relation in which

the possibility of undertaking new activities in old age is characterized by the existence or not of support in the family.

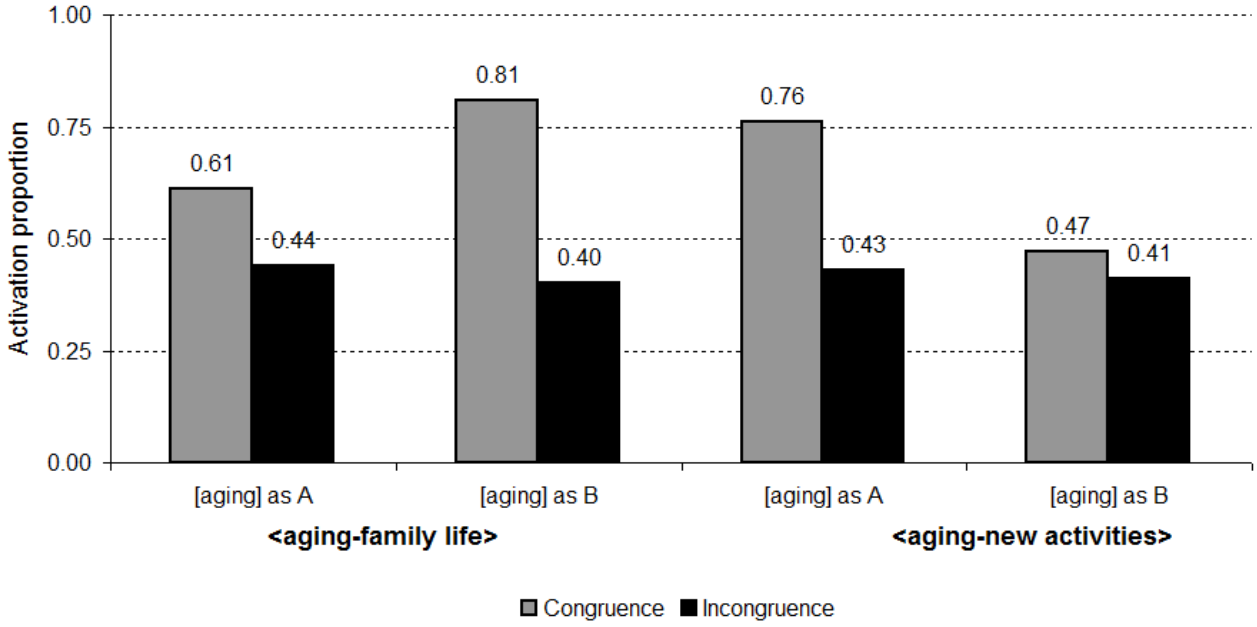

Figure 10. Three-way interactions for the two separate log-linear analyses relative to each connection point

The results relative to the activation of EVAL connectors are presented in Tables 64 and 65. From the observation of frequency distributions it can be seen that the range of activation proportions is already smaller, from 38.5% to a maximum of 61.4%.

Table 64. Contingency table containing the results of Study 5-B relative to the activation of EVAL connectors

R1 cognem: <health-medical care>	R2 cognem (connection point)							
	<aging-general decline>				<aging-health problems>			
	Order in triplet				Order in triplet			
	[aging] as A		[aging] as B		[aging] as A		[aging] as B	
R1 cognem content compatibility	NO	YES	NO	YES	NO	YES	NO	YES
Congruence	35	35	27	43	30	40	39	31
Incongruence	43	27	29	41	38	32	42	28

And indeed, the saturated model presented in Table 65 does not have a significant global effect. The EVAL relations for the assessed connection points do not indicate the existence of a

direct coordination between the involved cognems. Yet again, it does not mean that the evaluative relations are invalid, as the activation proportions are fairly high in some cases; they just do not seem to refer to inter-representation cognem dependency, as their values are independent from specific configurations linked to the cognem from the other representation in the system.

Table 64. Saturated log-linear model for EVAL connectors.

Effect	Y^2	*df*	*p*
R1 cognem compatibility	.00	1	= 1.000
R2 cognem	.00	1	= 1.000
Triplet order	.00	1	= 1.000
Activation	.06	1	= .801
R1comp x R2cog	.01	1	= .926
R1comp x Tr.ord	.00	1	= .956
R1comp x Act.	3.12	1	= .077
R2cog x Tr.ord.	.00	1	= .969
R2cog x Act.	1.60	1	= .207
Tr.ord x Act.	.58	1	= .448
R1comp x R2cog x Tr.ord	.03	1	= .867
R1comp x R2cog x Act.	.01	1	= .941
R1comp x Tr.ord x Act.	.83	1	= .362
R2cog x Tr.ord x Act.	8.69	1	= .003
R1comp x R2cog x Tr.or x Act.	.01	1	= .928
Global	14.91	15	= .458

Discussion

The first point to be addressed concerns the structural status of all cognems involved. For all R2 cognems (related to [aging]), the status was very similar to what was found in Studies 3 and 4. <Aging-family life was characterized as a central element>, while <aging-health problems>, <aging-general decline> and <aging-new activities> had peripheral status. <Aging-general decline> had central status in Study 3, peripheral status in Study 4, and again peripheral in Study 5-A, but it is important to point out that the rejection proportions in those studies were all really close: 68.6%, 66.7% and 65%, respectively. It is confirmed that it is an element that is situated at the border between centrality and peripheral status, but the results indicate stability when it comes to the proportion itself. If we stress that the adopted cut-off proportion is admittedly arbitrary and that the cognem did not show a striking majority as did, for example, <aging-family life>, then it does seem that assuming that <general decline> is a peripheral element that has very strong salience is indeed the best option.

Concerning the manipulated R1 cognems, <health-medical care> had a peripheral status that was compatible with the characterizations from Studes 3 and 4, but there was a conflicting result

involving <family-support>: the rejection proportion of the incongruence condition had a mere 41.4% in rejection proportion, very far from the 82.6% observed in Study 3 and 76.5% in Study 4. According to the results from Study 5-B, we would have to say that <family-support> is a peripheral element. But if we analyze the task that we employed in that study, it becomes clear that the specimen is set to the participant as a family from the start, taking away the freedom to dissociate the specimen from the [family] class. In order for the task to reflect a classical questioning task, we would have to refer to the Trevisan as "a group of people" or something similar, and only then the participant would be truly free to decide whether they were a family or some other kind of group. We took that possibility away because we prioritized the reference to [family] in the connection point task, the main interest of the study.

Moreover, we had in mind the striking findings of Lheureux et al. (2008), that demonstrated that the centrality of some social representation cognems is due not to their semantic value, but to their normative character. Having in mind that Study 3 did not allow us to identify a role of preference for the cognem in question, the affective loading item was seen as a way of capturing strong evaluative roles. The strong effect that we found seems to point out in that direction; if <family-support> is taken as a central element, then it is so due to an evaluative role that it performs on occurrences of families. The existence of support is not a necessary condition to define a family (which would imply centrality associated with absolute semantic value), but rather the existence or not of support is taken into account for one to decide whether a given family is "good" or "bad".

Moving on to the assessment of inter-representation connection points, although not all directions of the investigated connection points were assessed – we only investigated dependency relations related to the compatibility of content of a cognem specimen with the R1 cognems – our results indicated that in Study 5-A the two connection points were characterized by a direct dependency involving the <health medical care> cognems, occurring in both directions, marked by evaluative bridge relations. There were also valid and highly activated two-directional semantic relations that were independent from the manipulated specimen, especially for the cognem that included <aging-health problems>. Study 5-B had different patterns of semantic coordination for the two connection points. In the case of the relation with <aging-family life>, the dependency was accentuated when the [aging] cognem was the second term in the triplet. Rather, for the <aging-new activities> connection point the dependency pattern only emerged when the [aging] cognem had the first triplet position. As for evaluative relations, valid but indirect associations were identified, as was the case for the semantic connectors from the first study of this chapter.

Those results point out to the heuristic value of the connection point devices; both studies provided consistent results that evidenced the gain that one might have from assuming that a relationship involving two cognems from two different social representations can be formalized through a bridge relation included in an SCB model. By formalizing inter-representation relations this way, it is possible to measure the value of CtC relations, define if they are valid (having high valences) or invalid (having low valences, potentially non-existing relationships) and if a direct coordination can be identified, in the cases in which valences change together with the validity of cognem content in a given social object specimen. The results allowed for the differentiation of valid relations and cases in which inter-cognem dependency was identified. In the current studies, probably due to the fact that we selected cognems that had been characterized as having already a certain association level in Study 3, no invalid relations were identified. In addition, all relations were qualified in terms of hyperconnectors.

This conceptual framework involving connection points and inter-representation bridge relations through SCB connectors is a refinement and expansion of the possibilities presented by Fraissé's (1999) study, which dealt with the issue of OtO relationships for the first time. It does seem to us that there must be a relationship between OtO and CtC relationships. It might be that OtO relations imply the existence of CtC relations that support them, i.e., some CtC cognems might weigh more than others and determine the general configuration of an OtO relation. Or, it could be the other way around; in any case, studies to investigate the conditions and causation directions of those relationships at different levels are needed.

Also in this vein, one theoretical benefit derived from adopting the conceptual device of connection points is that it provides a common mechanism through which social representations within a same system can get into relationships, independently of being in a state of conjunction. Future research on this topic could try to identify the mechanisms that explain the existence of the conjunction configurations identified by Abric and Vergès (1996) and Guimelli and Rouquette (1994) and that organize Flament and Rouquette's (2003) classification of inter-representation relations. The possibility of investigating inter-representation coordination at the level of cognems involves the identification of what we called relevant, direct changes in the intensity of bridge relations; in Studies 5-A and 5-B we believe to have identified some cases of those coordination relationships. The also commented possibility of having valid and strong relations that are apparently not dependent on cognem-related configuration demands further investigation; it is necessary to find out if some other type of relation or structural mechanism supports those associations, if a third cognem or relation supports them, and so on.

As for complementary aspects, it is still premature to have a clear position on the role of the structural status and triplet order variables. In terms of structural status, we could tentatively state that the manipulation related to a peripheral element (Study 5-A) evidenced the existence of evaluative dependency relations with other two peripheral elements and not that of semantic ones, whereas the opposite was true for a manipulation linked to a central element - assuming that <family-support> is indeed a central element with a normative role – related to a central and a peripheral element (Study 5-B). There might be some degree of specificity related to the content of the elements and representations taken into account, and also we are aware of the fact that both central and peripheral elements might assume descriptive/semantic or normative/evaluative roles (cf. Moliner, 1992; Lheureux *et al.*, 2008), but it is correct to say that at least in the current studies the central element related to the experimental manipulation was involved in a semantic relation and the peripheral one was associated with an evaluative role. If this is specific to these studies or a general trend, is yet to be investigated. Nevertheless, the possibility of identifying the roles of cognems not only with the social representation that they "belong to" but also in managing inter-representation relations is a promising idea.

Triplet order, on the other hand, does not allow for the identification of a logic from our results that is related to structural status or valences, just as in Study 3. Some cognems take higher valences in certain positions of a relation triplet than others; and for the time being we will rely on specificity linked to content to explain that.

With the two studies presented in the current chapter, we believe to have demonstrated the empirical pertinence of connection points and bridge relations, as they are compatible with – and directly derived from – the theoretical body of the structural approach on social thinking and make it possible to trace new empirical pathways, opening many possibilities of research lines.

General discussion

Although each research chapter from the present thesis has a complete discussion of its own addressing the theoretical and methodological topics raised by the studies, it is necessary to comment some general points that characterize the effort as a whole. The current section aims at giving the reader an overview of what was achieved, evaluations on the innovation made possible by the research and on the importance of its findings. In addition, we will discuss the potential for the application of the findings in professional interventions, limitations of the studies, and we will also identify future investigation perspectives.

Overview of the research

We had the broad objective of contributing to the understanding of the structural processes linking different social representations together. Fully situated at a structural perspective on social thinking and social representations (Rouquette, 1973; Guimelli, 1999; Chapter 1), we tackled that problem through the notion of representational system, proposed to the literature on social thinking by Bonardi *et al.* (1994) and Garnier (1999), and adopting a conceptual framework founded on knowledge units (Codol, 1969) formalized by the Basic Cognitive Schemes model (Guimelli & Rouquette, 1992; Rouquette, 1994a; Chapter 2). Upon examining the literature on inter-representation relations (Abric & Vergès, 1996; Fraissé, 2000; Milland, 2001; Flament & Rouquette, 2003), we have identified the need of developing theoretical models to explain the mechanisms able to take cognem-to-cognem relations within representational systems into account (Chapter 3).

In order to do so, we first needed to have a characterization of a representational system, with which we would later work with. After having explained why [aging] is a suitable social object to direct our efforts to, we have characterized the social representation on it, demonstrating that it is indeed a social representation object as there are variation in representational structures linked to culture and age groups. We chose to work with that social object and groups of young undergraduates, due to them being examples of groups of young people, as age groups are highly relevant to explain the differences in social representations on [aging]. We have also identified the elements of that representation and characterized their structural status (Chapter 4: Studies 1-A and 1-B). We then identified some social representations that were likely to be associated with [aging] within a same representational system, characterized their structures and verified that there was empirical evidence for the plausibility of the mentioned system (Chapter 5: Study 2). At that point,

we had reasonable knowledge of the representational system, including the representations that were part of it, their structures and interconnections at the level of objects.

After the obtention of baseline characterization data of the representational system, we moved on to more refined studies about inter-representation relations. We selected social representations on [health], [family] and [death] and studied their object-to-object relations with the social representation on [aging], in a forced associations paradigm (Fraissé, 2000). The existence of relations among the representations could be empirically retrieved and corresponded to the subjective perception of young people about the direct proximity among those representations (Chapter 6: Study 3). The interpretation of the object-to-object relations in the representational system formulated around the social representation on [aging] made explicit the interest of being able to assess inter-representation cognem-to-cognem relations.

Since we had data about the perceptions of young people in terms of which elements of the representations that interested us were connected to the elements of the social representation on [aging], we could design studies that helped us evaluate the validity of conceiving cognem-to-cognem relations involving two different social representations. Through the induction of context salience effects linked to the cognem of one social representation from the system, we have verified that it was possible to affect the activation of an element from another social representation that was related to the first one. This was taken as evidence of the pertinence of characterizing inter-representation cognem-to-cognem relations (Chapter 7: Study 4).

We then proposed a theoretical formalization of inter-representation cognem-to-cognem relations, through the introduction of two concepts: connection points and bridge relations. While doing so, we have addressed differences between relations that were stable to variations related to the validity of the cognems in a connection point and relations that indicated a true horizontal coordination between two cognems, implying some sort of dependency. We have finally verified empirically that the model including connection points and relation bridges was useful to retrieve specified cognem-to-cognem relations and distinguish between invalid relations and valid ones, linked to cognem dependency or not (Chapter 8: Studies 5-A and 5-B), obtaining positive results.

Relevance

The main contribution of the research is to demonstrate the pertinence of approaching inter-representation relationships at the level of cognem-to-cognem relations. Previously some patterns of inter-representation relations had been identified, summarized by a classification effort done by Flament and Rouquette (2003). As developed in Chapter 3, the associations between social representations, called coordination relations, could be classified into conjunction and disjunction

cases. The former included cases in which the verbal signs labeling elements or broad themes in which elements could be situated were involved in belonging and intersection patterns across two or more representation structures. The latter were defined by the fact that such intersections were non-existing, implying that the interconnections between representations would have to be identified in some other way. The understanding of inter-representation relations then lacked the possibility of explaining mechanisms through which the conjunction configurations could take place, and practically nothing was said about disjoint social representations.

If each social representation is a structure itself (Abric, 1994a, 1994b), it is most often necessary to take its nature into account when explaining phenomena related to it, and doing so implies referring to a structure of knowledge units that designate the object that the representation represents, and taking the particularities of the status and relations associated with those units also into account while doing it. As a consequence, the consideration of cognem-to-cognem relations is a necessity to have a complete picture of phenomena related to inter-representation relations.

With Study 4 we have demonstrated empirically that the cognems from different representations may be interconnected when it comes to their activation, and in Chapter 8, including the empirical verifications of Studies 5-A and 5-B, we have proposed a framework that makes it possible to study inter-representation cognem-to-cognem relations. That model is advantageous as it makes it possible to retrieve inter-representation links in the cases of both joint and disjoint social representations.

A second contribution from the thesis is the adoption of a second-order structure: the representational system. Studies like the ones from Bonardi *et al.* (1994), Garnier (1999) and Milland (2001) had identified those systems and assessed them empirically. We have tried to fit the notion of representational systems within the social thinking architecture in a way that could be compatible with basic cognitive schemes models. Throughout Studies 2, 3, 4, and 5-A and 5-B we went up one level in describing knowledge structures and operationalized a representational system as a set of social representations maintaining relations among themselves. It is only through this perspective and the assumption that social representations might operate together according to some rules that the study of inter-representation relations is possible. Through various techniques we have assessed the interactions of representations and captured their sense. By doing so, we sophisticated the knowledge of the [aging] object by taking into account the relationships maintained by the elements and broad label of that structure with other ones, as done in Studies 2 and 3.

Research that tries to characterize social representations concerning their mutual association gains by opening new doors in terms of level 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 (1968) guidelines for a structural approach.

Another advancement put forward by our research can also be identified in methodological terms. It contains probably the first set of studies to employ log-linear analysis for the assessment of survey and experimental designs containing SCB items. It is usually the case that chi square tests or ANOVAs are employed to analyze similar data, as pointed out by Rouquette and Rateau (1998). Each has advantages and disadvantages. If, on the one hand, chi square tests respect more the consensual nature of SCB data and detach the analysis from the individual participants that provide the responses, on the other one they are restricted to single factor evaluations and create problems for the analysis of interaction effects and multiple comparisons, lacking clarity and increasing statistical error. Likewise, the ANOVAs do accommodate factorial designs well, but they lose where the chi square test wins: they are mostly a paradigm for the analysis of variations of data from individuals. Well, log-linear modeling and log-linear analysis, in this sense, have the best of both worlds. Through working with contingency tables and what Rouquette and Rateau referred to as more collective data, and also making it possible to expand analysis of such tables for multiple-way tables, they are one of the most valuable – and under-utilized – analytical assets that experimental researchers interested in the structural approach on social thinking could make use of. Through a systematic use of such analysis in Studies 1-A, 1-B, 3, 4, 5-A and 5-B we have hopefully shown its pertinence in the field and hopefully that might inspire others to follow the same path.

Limitations

Certain issues brought to light by the research in the thesis evidence the limitations of the studies and the methodological strategies undertaken, and at the same time urge for the planning of research aiming at addressing those topics. Two variables probably play an important role in the processes regulating cognem-to-cognem inter-representation relations. The first one is structural status. In Study 4 and its complementary study we observed that peripheral elements subjected to context effects may be associated with different activation degrees of elements from another representation. It did not happen when we subjected a central cognem to a context effect, accordingly with what is known from the literature on social representation structure (Guimelli, 1995; Lo Monaco *et al.,* 2007): central elements are more stable. In addition, what about the R2 cognems, in that case? In Study 4, we assessed cognems that are probably peripheral in status, but had a somewhat borderline characterization. Would we have obtained similar results if we had clear-cut peripheral or central elements? We do not know, as this point was not systematically assessed.

Further we observed that horizontal dependency relations (effects of the R2 cognem content validity variable in two or three-way interactions) privileged evaluative relations when R1 cognem was peripheral (Study 5-A), and semantic relations when the R1 cognem had central status (Study 5-B). It makes sense, in the case of central elements being more unconditional and peripheral elements working as specifiers of other elements. But are those patterns generalizable? We have to remember that Lheureux *et al.*'s (2008) study demonstrated that social representation elements have both dimensions regardless of their status. So it could just be that in this case it is the role of the element that is playing a most important part on the process, and not the status itself; or it could be a joint effect.

Our results also lead us to formulate many other questions: what is the role of structural status in the activation of connection points, both in terms of the cognem that undergoes a context effect induction and in terms of the cognem that is consequently indirectly activated? What role does structural status play in organizing connection points and their bridge relations; is there preferably a symmetry or asymmetry in the coordination/dependency relations that are established? And what is the role of the semantic and evaluative dimensions in those processes? How do structural status and those dimensions interact? We cannot provide answers for those questions at this point; having just mostly identified the existence of a set of related phenomena, there is still all the room for refinement of the knowledge on them.

The effect of triplet order in connection point functioning is even less known. The results obtained in Studies 3, 4, and 5-A and 5-B show that cognem activation in inter-representation relations is not indifferent to the order of terms in the triplets. But it is yet to be found out if structural status, overall or partial valences or other structural variables are strongly associated with the favoring of specific positions, or if explanations should be looked for at the level of the contents of each social representation – which according to Rouquette and Rateau (1998) would be definitely less interesting if we are concerned with formulating theoretical models on knowledge structures.

In a general comment, the generalizability of our findings is considerably restricted. Only one representational system was taken into account, and a few representations in it; we did not exhaust possibilities concerning the structural status and roles played by the cognems, as the identified connection points that we relied on consisted of a very limited pool of possibilities. What's more, when it comes to the connection points that were assessed in Studies 5-A and 5-B, only half of the possibilities were empirically investigated, as only one part of the two-directional connections was put to test.

Future perspectives and application potential

One first comment on the future perspectives opened by the research on the thesis derives from the identified limitations. While research answers some questions, it usually brings about the emergence of many others, and guides the planning of further studies to reach suitable answers for the latter. Future basic investigations should then be directed at understanding the roles of structural status, dimensions and triplet order on inter-representation relations, as well as of other variables or properties that might be pertinent.

This can only be done through the reproduction of similar designs with different social objects and various social representation elements with different structural statuses. By proceeding that way it will eventually become clear what aspects of the relevant phenomena are common to all representation structures, what others are traceable to structures and configurations with specific characteristics, and finally which do not seem to be governed by structural regularities.

Only through the identification of some level of structural invariants that is independent of content it is possible to achieve a truly structural model (cf. Rouquette & Rateau, 1998). Our actual position is that the generalizability of structural patterns should be tested or verified in different configurations in terms of representations and elements. In studies with single structures, that would mean that a representational process or characteristic should be identified in more than one structure for it to constitute a potential structural regularity. In the case of inter-representation relations, it would then mean to characterize different representational systems or components. We have not been able to done so in this thesis due to the size of that task in the context of a doctoral course – if it is labor-some to work with one social representation, what to say about representation sets! – but hopefully that blank will be dealt with in future research.

Another promising path for future research involves verifying the cognem-to-cognem processes and configurations implied by each type of the already-identified conjunction relations. This would constitute a pass between two structural levels and each one of them would increase the level of knowledge on the other – and consequently, of the processes as a whole.

Throughout the thesis we have worked at the level of the activation of cognems, i.e., at the level of association of thoughts in various conditions. According to the knowledge on social representation dynamics, 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; Mugny, Moliner & Flament, 1997; Moliner, 2001a; Mugny, Quiamzade & Tafani, 2001; Tafani & Souchet, 2001). It is then evident that one of the research lines that could suffer the most impact 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 (Souchet & Tafani, 2004; Mugny *et al.*, 2009).

Up to this point, single representations have directed the interest of researchers. 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 (2010) research that showed evidence that the social representation on the [LAVIA], a device responsible for speed control in cars, is linked to drivers' representations on [speed] and [speed limitation]. If those representations are associated by means of connection points, then a transformation in the social representation on [speed] would probably be linked to a compatible change in the representation on the [LAVIA].

Or we could be interested not in transforming one cognem, but in the way that two representations are related to each other. In this case, we could try to attack not a cognem or the other, but to modify the bridge relation that links them, or try to suggest other bridges connecting previously unrelated cognems, also taking into account of their status. These are just a few of the multiple combinations and alternatives that can be identified, accounting for diversification and vitality brought to the field by the potential of the proposed models. This is analogous to the then new possibilities that were presented by Moliner (1996) when bridging theoretically images and social representations: the activation process linked to a social image can be directed through multiple paths: the induction of different representations, the interference on imaging cognitive processes, and the transformation of the social representation structure that gives support to an image.

Finally, although the current thesis was aligned with basic research, it is easy to derive implications for application. Results from social representation characterization make it possible to infer the bases of those representations and to plan measures to transform them. In the case of [aging], can we identify a gap between an adaptive view of old age and of the aging process

according to what is suggested by positive (Gergen & Gergen, 2000) and successful aging perspectives (Baltes & Baltes, 1990) and the social representations on [aging] shared by young and elderly people? What are the consequences of sharing those representations, in terms of psychological and social well-being? Such questions and the interest that underlies them is what makes it possible to identify a problem and devise procedures to change that knowledge into more "healthy" beliefs.

In just the same way, data relative to inter-representation relations just increases the amount of information that one can get about the phenomenon and reveal a new array of intervention possibilities. One example: from the results of Study 5-B, two valid relations in terms of the logic shared by the participants can be inferred. One, that the quality of family life in old age evaluates the existence of support in the family; and two, that the existence of support in the family is what evaluates the possibility of taking up new activities in old age. The existence or not of support in the family (or its quality) acts as a mediator between the quality of family life in old age and the possibility of doing different things in that period of life. Although we had samples of undergraduates, let us assume, for the sake of our example, that such relations would be found also among elderly people. After such a diagnosis of the schemes of reasoning of the elderly, professionals could then plan services in order to enhance the quality of family life of elderly people, knowing that it would probably impact positively their perception of being supported by others and might motivate them and make them perceive more openings to carrying out new activities. That is just one example that illustrates the value of new information made available by research on inter-representation relations. Another possible measure in that scenario would be to provide alternate sources of support for the elderly, such as institutional settings or peers, encouraging them to take on new activities. The chances for success are high if backed up by detailed knowledge of the mentality that is involved. However, it must be stressed that the knowledge of inter-representation relation configurations found in one sociopsychological context (group, population, historic period…) cannot be generalized to another one without further characterization research. Moreover, it is more likely that new and simplified research strategies to identify and characterize inter-representation relations will have to be developed in order to make intervention and applied efforts possible, perhaps through more direct qualitative mapping or association tasks. Instruments employing classical SCB tasks are useful for higher precision in the assessment of relations in basic studies, but a little restrictive in terms of the populations that are accessible to them. This of course does not mean that the principles of the SCB model cannot be used to guide the development of new methodological resources for social representation characterization…

Final remarks

To conclude, we would like to reaffirm the theoretical perspective affiliation of the research conducted in the thesis, so that it might not be mistaken for what it is not, but taken for what it is. We have conducted a set of structural studies, and in this sense we have tried to characterize knowledge structures (social representations) and identify processes related to activation laws bringing them together. From a true structuralist perspective, laws involving content are not the focus of our interests; rather we are concerned with structure in the sense that other variables and properties of the units that we work with can interact according to identifiable patterns or regularities. As such, content is taken as a secondary quality of knowledge processes, and understanding structure is the main goal.

Throughout this work, we have privileged the study of knowledge, and have set the cornerstones of our model of reference in the formalization provided by the basic cognitive schemes model. It is our view that the SCB perspective – in terms of a theoretical model on the nature of knowledge; we are not addressing the empirical techniques here - presents a framework of types of knowledge units and relations and aggregation mechanisms that can accommodate a vast proportion of the findings obtained by the structural approach on social thinking into a coherent body of knowledge. We are convinced that a perspective that tackles research problems about social knowledge through a basic cognitive schemes formalization can bring together the efforts achieved by structural researchers, in the sense that a solid conceptual network on cognitive and symbolic processes could be most useful when it comes to understanding the role of social variables in knowledge. With this thesis, we have tried to add another piece to the puzzle that is the social psychology of social thinking, and hope to have demonstrated at least to some extent the pertinence of the perspective that we support.

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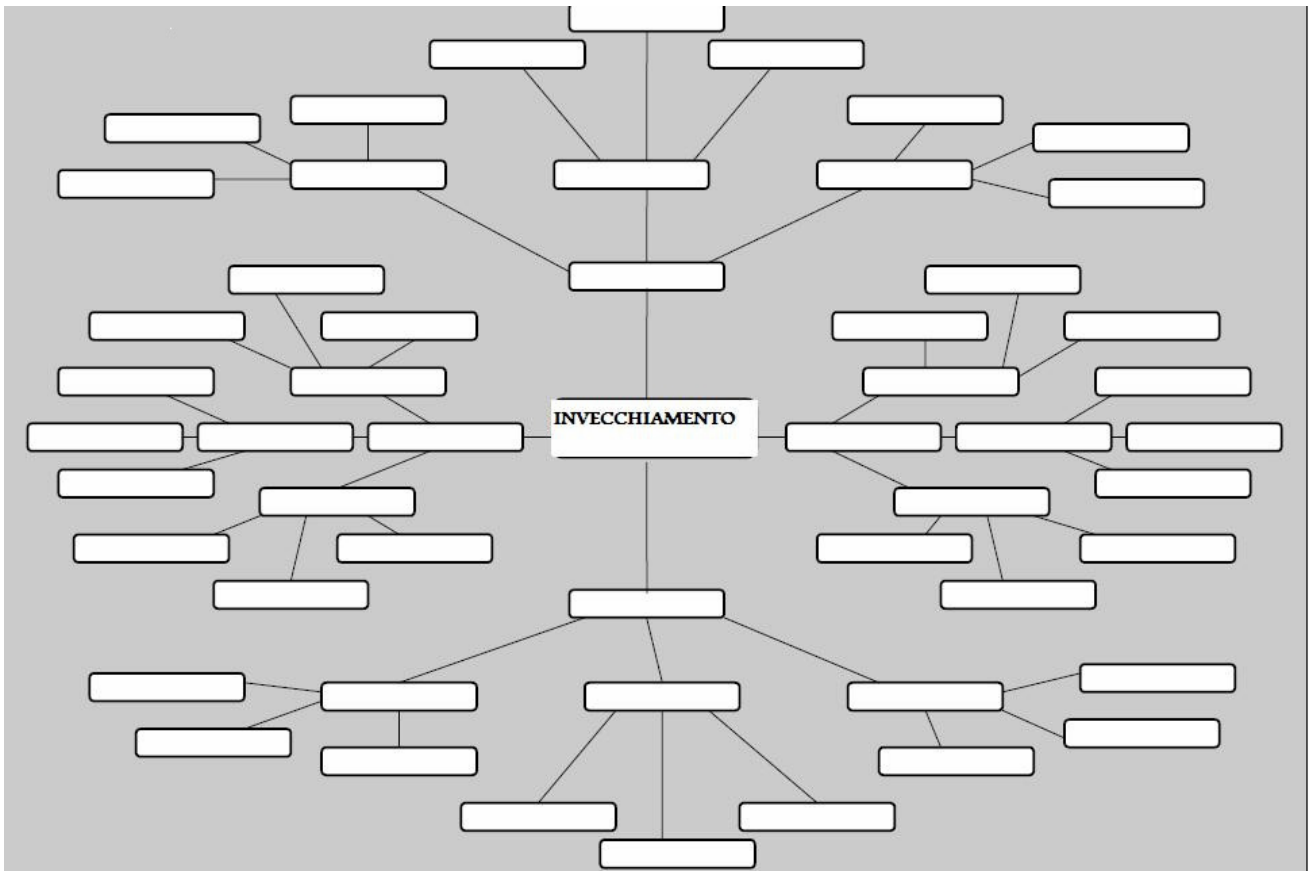
Appendix

1. Associative network example (reduced size: the original version employed a full page at a horizontal position)



2. Interview instructions scripts

The instructions and scripts for the whole interview are reproduced below, comprising the associative network task, and the semi-structured interview. All interviews were conducted by native women students.

Italian script

Istruzione iniziale

Io sono una ricercatrice dell'Università di Padova e partecipo di un progetto di ricerca del Dipartimento di Psicologia Generale sulle cose che le persone pensano sull'invecchiamento. La Sua partecipazione è molto importante perché possiamo capire come si organizzano le idee su questo tema.

Quello che propongo io è un'intervista, una conversazione in cui parleremo delle vostre idee riguardando l'invecchiamento, la vecchiaia, e l'invecchiare. Prima faremo insieme un compito in cui compileremo una scheda strutturando le Sue idee su questo tema. Mentre la facciamo, Lei potrà parlare liberamente, dando opinioni o approfondendo quello che dice. Anch'io potrò fare delle domande perché le risposte siano più chiare.

Dopo parleremo tra di noi sul tema dell'invecchiamento e Le farò qualche domanda che Lei potrà rispondere liberamente.

Tutta la conversazione sarà registrata, perché io possa ricuperare quello che è stato detto in dettaglio dopo. Però Lei non sarà identificato in nessun momento.

Scheda associativa

Lei potrebbe dirmi quattro parole o espressioni che Le vengono in mente quando Lei pensa all'INVECCHIAMENTO?

Queste parole sono, secondo Lei, neutre, positive, o negative?

Seconda corona: Lei potrebbe dirmi tre parole o espressioni che Le vengono in mente quando Lei pensa in Invecchiamento e (parola della prima corona)?

Queste parole sono, secondo Lei, neutre, positive, o negative?

(COMPLETARE LA SECONDA CORONA)

Terza corona: Lei potrebbe dirmi tre parole o espressioni che Le vengono in mente quando Lei pensa in Invecchiamento, (parola della prima corona) e (parola della seconda corona)?

Queste parole sono, secondo Lei, neutre, positive, o negative?

(COMPLETARE LA TERZA CORONA)

Domande complementari durante il compito della scheda associativa

Cosa Lei vuole intendere precisamente per ….. ?

Lei potrebbe farmi un esempio di quello?

Lei potrebbe raccontarmi un po' in quale occasione questo è successo, e se a Lei o a una persona da Lei conosciuta?

Ecc….

Alla fine, scheda completa:

Lei potrebbe indicarmi cinque parole che secondo Lei sono le più importanti riguardo l'invecchiamento?

Parte semi-strutturata

Credenze sull'invecchiamento

Cosa associa Lei al termine l'invecchiamento?

Cosa pensa e Qual è il suo modo di vedere dell'invecchiamento?

Cosa significa per Lei "invecchiare"? Fa qualcosa a riguardo? Perché?

Quanti anni deve avere secondo Lei una persona per essere considerata anziana?

Cosa pensano le altre persone della Sua età sull'invecchiamento? Quali sono le cose positive del Loro pensiero? Quelle negative?

Cosa fanno le persone riguardo all'invecchiamento? Perché lo fanno?

Aspetti esperienziali e narrativi

Quando si è sentito "vecchio" la prima volta? Se c'è stata…/è stato cambiamento positivo o negativo?

Lei potrebbe raccontarmi cos'è successa in quella (o quelle) occasione (i)?

Lei potrebbe raccontarmi cosa ha pensato e come si è sentita in quella (o quelle) occasione (i)?

Parte finale / riassunto e commentari complementari

(Qua si fa un riassunto di quello che l'intervistato ha detto, in qualche parola)

Lei vorrebbe dire qualcosa in più riguardando alcun tema di questa conversazione?

Secondo Lei, cosa mancava in questa conversazione per ché Lei vuole aggiungere su cosa pensa dell'invecchiamento?

Portuguese script

Instrução inicial

Sou uma pesquisadora da Universidade Federal de Santa Catarina e participo de um projeto de pesquisa do Laboratório de Psicologia Social sobre o que as pessoas pensam sobre o envelhecimento. A sua participação è muito importante para que possamos compreender como se organizam as idéias sobre esse tema.

O que proponho é uma entrevista, uma conversa na qual falaremos das suas idéias a respeito do envelhecimento, da velhice e de envelhecer. Primeiro faremos juntos uma tarefa em que completaremos um cartão que nos ajudará a organizar as suas idéias sobre o tema. Enquanto estivermos fazendo isso, você poderá falar livremente, dando opiniões ou aprofundando o que você diz. Eu também farei algumas perguntas para que as respostas sejam claras.

Toda a conversa será gravada, para que eu possa recuperar o que será dito em detalhe depois. Porém, você não será identificado em momento algum.

Cartão associativo

Você pode me dizer quatro palavras ou expressões que lhe vêm em mente quando pensa no ENVELHECIMENTO?

Essas palavras são, para você, neutras, positivas, ou negativas?

(COMPLETAR A PRIMEIRA COROA)

Segunda coroa: você pode me dizer três palavras ou expressões que lhe vêm em mente quando você pensa no envelhecimento e (palavra da primeira coroa)?

Essas palavras são neutras, positivas, ou negativas?

(COMPLETAR A SEGUNDA COROA)

Terceira coroa: você pode me dizer três palavras ou expressões que lhe vêm em mente quando você pensa no envelhecimento e (palavra da segunda coroa)?

Essas palavras são neutras, positivas, ou negativas?

(COMPLETAR A TERCEIRA COROA)

Perguntas complementares durante a tarefa do cartão associativo

O que você quer dizer com .... ?

Você pode dar um exemplo disso?

No fim, cartão completo

Você pode me indicar cinco palavras que para você são as mais importantes a respeito do envelhecimento?

Parte semi-estruturada

Crenças sobre o envelhecimento

O que você pensa do envelhecimento, e qual o seu modo de vê-lo?

O que significa para você "envelhecer"?

Você faz algo a respeito? Por quê?

Segundo o que você pensa, com quantos anos uma pessoa pode ser considerada idosa?

O que você acha que as outras pessoas com a sua idade pensam do envelhecimento?

Quais são, para você, os aspectos positivos e os negativos do que você disse?

E por que acha que elas pensam assim?

O que você acha que as pessoas fazem as respeito do envelhecimento?

Por que fazem isso?

Aspectos experienciais e narrativos

Como você pensa que se sentirá na primeira vez que se sentir “velho”? Pensa que será uma mudança positiva ou negativa?

Pensa que existirá alguma ocasião em que você terá vantagem na velhice? Pode me contar em qual ocasião e como pensa que isso ocorrera? E as desvantagens?

Parte final / resumo e comentários complementares

(Aqui faz-se um resumo do que o entrevistado disse, em poucas palavras)

Você quer acrescentar alguma coisa sobre algum tema dessa conversa?

Para você, o que faltava nessa conversa? Quer acrescentar algo sobre o envelhecimento?

3. Example excerpts of discourse related to elements of the social representation on [aging], in the original languages

Wisdom

To age is to gain wisdom / invecchiare è guadagnare saggezza / envelhecer é ganhar sabedoria.

"C'è questo mio zio che lentamente sta invecchiando tantissimo, ha lavorato tantissimo, ha le sue magagne, le magagne sono collegate a livello di immagine alle rughe del volto, al fatto di essere vecchio, di stare un po' alla volta spegnendosi con la sua malattia ecc. Si sta avvicinando alla morte però comunque sente ancora questa spinta nel trasportare la sua esperienza, sia ai figli che però non stanno seguendo la loro strada ma a chiunque che adesso in questo momento è disposto ad ascoltarlo, a capire cosa ha fatto lui negli anni".

"Gli aspetti positivi stanno nel fatto che se uno è invecchiato o meno significa che ha vissuto. Vuol dire che ha passato che ha vissuto del tempo che gli è stato offerto, poi che l'ha raccolto o no sono affari suoi, però. Ha avuto del tempo a disposizione, gli aspetti positivi sono anche l'esperienza e il fatto di poter aiutare anche le altre persone,volendo, dipende. E basta".

"Praticamente sappiamo da dove partiamo e sappiamo dove andiamo. Quello che ti procura l'ansia, l'ansia della morte la paura della morte".

"Non mi piace invecchiare perché se fossi giovane starei meglio, però neanche soffro, perché appunto l'esperienza che la vita mi ha dato mi ha reso anche più matura, più tranquilla più serena ecco".

"Perché la conoscenza secondo me, è un punto di forza de dell'età, appunto oltre l'età adulta insomma, cioè io identifico poi la vecchiaia con appunto con diciamo la fine. di un percorso, in cui comunque ha acquisito una serie di conoscenze di esperienze, di saperi, e io vivo le conoscenze, le esperienze e i saperi come la forza,una forza che aiuta sia ad andare avanti, perché comunque magari può stimolare ulteriori interessi, sia comunque una forza per gli altri".

"Eu penso que o envelhecimento assim é bem relacionado com o que eu falei das perdas e ganhos, que tu perde algumas coisas que na juventude já eram essenciais, relacionadas com a beleza, o corpo... Essas coisas tu vai perdendo, mas ao mesmo tempo tu vai ganhando uma experiência tão rica que... Eu tenho vinte e um anos, mas assim, que com o passar do tempo, essa experiência... Não é que com o passar dos anos essa experiência tome o lugar de coisas que tu perde. O que tu tinha tu não vai ter mais, mas tu começa a ganhar coisas mais importantes. Que é experiência, conhecimento, paciência..."

"Eu acho que a experiência da vida faz o envelhecimento ser uma coisa nobre. Essa é a primeira coisa que eu vejo, não vejo a coisa de você ficar debilitado, no sentido de saúde, etc. Isso para mim é secundário".

Health problems

To age is to have to deal with health problems and illness / invecchiare è dovere affrontare problemi di salute e malattie / envelhecer é ter que lidar com problemas de saúde e doenças.

"E adesso che ci penso, forse ho un'immagine negativa perché poi ho visto mia nonna ad una certa età che le è venuta la malattia che gli è morta la personalità cioè, si è spenta. Attualmente mia nonna è viva però per me è morta, perché non c'è più, non esiste più la nonna che avevo prima, ma non perché sia invecchiata, ma perché proprio non ragiona più è malata, non ragiona più".

"Pensieri, mi riferisco tutto al lato: malattie, quello che può portare, può portare a dover correre da una parte all'altra, per gli ospedali, dottori, a medicine, tutte quelle cose lì".

"Você vai envelhecendo e o seu corpo não vai agüentando, você está sempre doente com alguma coisa, e então durante esse tempo que você fica no hospital são três coisas que você mais vê lá. São médicos, os exames, e os enfermeiros".

"Tem uns que envelhecem com saúde, outros já não tem saúde. Então quem envelhece com saúde, envelhece bem. Mas quem envelhece com doença, aí é muita tristeza né".

"A gente vai perdendo a saúde, com o passar do tempo a gente vai perdendo. Quer dizer, a máquina já vai cansando".

"Saúde porque a pessoa quando fica velha e não tem saúde, é triste né? Então acho que a pessoa envelhecer com saúde é bom. Ficar velha, doente e não ter mais nada pra fazer não vale a pena né? (...) O mais de tudo, negativo, é a doença. Pessoa doente... Velho doente... "

Death

To age is to get closer to death / invecchiare è avvicinarsi alla morte / envelhecer é aproximar-se da morte.

"Perché è l'anticamera della morte, il vecchio apatico, rincoglionito che un po' alla volta perde la percezione dell'essere, dell'esistere. (…) Riguardo alla morte, vuoto, e fine, non hai più la percezione, non hai più coscienza di te. (…) Non potrai più guardarti le mani, non avrai nemmeno la coscienza di non poterti più guardare le mani perché tanto tu non sei più. (…) Non si pensa tanto all'invecchiamento come fase terminale della propria vita, ecco. (…) Non pensare che un domani invecchi e muori perché a questo punto, vabbè, tanto vale che resti fermo".

"Eu não gostaria de envelhecer. O envelhecer é o fim. Significa daqui não tem retorno. Eu acho que é o fim de tudo. Dizem que existe uma outra vida. Mas ainda ninguém voltou pra dizer como é que é. Então é uma dúvida né. É uma dúvida".

Family

To age is to spend more time with the family / invecchiare è passare più tempo con la famiglia / envelhecer é passar mais tempo com a família

"Mi vengono in mente i pranzi di natale, le feste comandate dove la famiglia si riunisce e riconosce di far parte di un certo nucleo, dalla mia esperienza non si vivono questi momenti come formali, ma invece molto sentiti, molto vissuti, autenticamente, quindi è proprio un momento di calore".

"E que eu falei da união, da família, porque eu acho essencial, tu vai envelhecendo, cada vez mais tu dá valor pras pessoas e tu quer, tu te acostuma a que elas estejam por perto, sabe, por isso que eu falei de amizade, família, amor, essas coisas assim, afeto".

Eu sou feliz, porque tenho os meus filhos que me respeitam muito, netos, e tudo..."

"Eu acho que a pessoa quando envelhece, ela tem uma coisa que é muito importante para a felicidade dela. Ela sozinha não é feliz. Ela só é feliz se os filhos forem felizes. Então eu não posso dizer que eu sou feliz se eu estou vendo um filho com problema. Pra mim essa felicidade não é completa. Eu só vou ter uma felicidade completa se a minha família estiver toda bem".

"Tempo livre para dar atenção aos filhos, para a minha vida... Me concentrar na minha família... Eu quero continuar mantendo as minhas atividades na família assim.. Procurar fazer novos cursos. Estudar, porque eu estudo, eu faço italiano. Viajar... E dar mais atenção mesmo à família toda. Ao meu pai, meus filhos"...

New activities

To age is to take part in new activities / invecchiare è occuparsi di nuove attività / envelhecer é ocupar-se de novas atividades.

"Mi metterò a dipingere, uno può scoprire delle cose che gli piacciono, che non ha mai potuto fare, spero che non sia un'immagine che ho in mente, troppo idilliaca. Però lavorerò perché non sia idilliaca ma sia reale. Anche con persone di altra età o con dei nipoti o con dei ragazzini, o con i figli. Un anziano può fare attività di. non so se volontariato o può inserirsi in gruppi di età miste, senza necessariamente essere ghettizzato, penso sia possibile e sarà un vantaggio sia per lui sia per gli altri, sì perché l'anziano che sta solo tra gli anziani invecchia prima, cioè".

"Cessi di lavorare, comunque hai una indipendenza economica e per quello che puoi la utilizzi, hai più tempo libero e puoi utilizzarlo in questa maniera".

"Io sto solo pensando a tutte le cose che mi piacerebbe fare che vorrò fare, una volta che non avrò più gli impegni di lavoro. Sicuramente, quindi. Io ad esempio mi sono già prefissata che vorrò viaggiare tanto il fatto di andare in pensione, non sarà un essere relegati o un essere messo da parte, ma secondo me significa, per me molto più tempo e lo potrò dedicare ad una delle cose che mi piace di più, quindi andare in giro, viaggiare."

"Tempo livre eu associo muito à situação da aposentadoria e eu já tenho planos, desse tempo livre, o que eu posso fazer, quando eu não tiver mais a minha vida concentrada na parte profissional. Os meus planos seria resgatar alguma coisa que eu deixei de fazer na juventude. Eu tocava instrumento, parei... Eu fazia pintura em tela, parei... Então essas coisas que eu penso em fazer".

Social exclusion

To age is to be isolated and not considered by the others / Invecchiare è essere isolato e non considerato dagli altri / Envelhecer é ser isolado e não considerado pelos outros.

"Ci si sente inutili nel contesto del lavoro, produttività, economico sociale, affetti e passioni si riescono a vivere bene; una persona che vive nella società contemporanea si realizza. O la società contemporanea fa sì che si realizzi nel suo lavoro che è l'essere produttivo, compiere dei compiti e quando la persona non fa più questo non si sa bene neanche dove metterla, gli ospizi e queste forme di rinchiusone sono legate al dove mettere una persona che non fa più quello che una società aveva deciso che doveva vivere, però anche un anziano si sente inutile secondo me, perché lo percepisce, o perché gli viene imposto dall'esterno, sì forse è più un'imposizione della società. (…) Ci sono, per tutto il discorso di prima, per il fatto che spesso si è soli, spesso si sente al tg notizie sconsolanti, anziani, morti da giorni e ritrovati da soli e nessuno se n'era accorto perché o non hanno più nessuno o non c'è più nessuno che li segue li va a trovare e sono molto forti gli aspetti negativi, la solitudine l'abbandono la mancanza di attività di interessi che che l'anziano ha e dall'altra parte al società che lo elimina perché non lavora più, perché è faticoso stare con un anziano perché porta guai, malattie, sofferenza, sì magari proprio perché la società non vuole vedere la sofferenza e la malattia che allora che l'anziano viene messo da parte, però è il processo naturale. (…) Quindi mettere in atto delle buone pratiche di comportamento, e di relazione spero che quando sarò anziana la società non mi consideri un rifiuto da buttare".

"Tem gente que não respeita o velho. Sabe, que acha que a pessoa é velha, tem de ficar de lado".

"Eu acho que para muitas pessoas, o velho é uma pessoa inútil, um peso. E eu tenho a impressão que somente quando o idoso está doente, muitas vezes depois põem em asilos, em abrigos, e às vezes esquecem deles lá..."

General decline

To age is to lose mental and physical capacities / invecchiare è perdere capacità fisiche e mentali / envelhecer é perder capacidades físicas e mentais.

"Secondo me, fermo restando che è un processo, che non puoi evitare, l'unico modo per invecchiare decentemente sarebbe quello di fare quello che stai facendo adesso, mano a mano. Diminuendolo, perché comunque non puoi farlo per sempre, almeno alla fine dirai: io sono andato fuori a bere con i miei amici, fino all'altro ieri. Fare quello che si fa tutti i giorni , rendendosi conto che ormai si hanno dei limiti, mano a mano i limiti aumentano, e quindi pian piano".

"Invecchiare che cosa significa? Perdere l'entusiasmo, la gioia di vivere, perdere un po' tutto, il decadimento psichico, fisico, l'autonomia, tutte quelle cose lì, messe insieme, quello è invecchiare".

"E quella sì, mi dispiace, mi dispiace perchè l'invecchiamento mi rende più debole a far certe cose, cioè una volta ero più energica mi muovevo con facilità, adesso faccio fatica, mi vengono fuori i dolori qualche volta la mattina".

"Secondo me si dicono tante belle cose, del tipo no, vabbè hai le rughe d'espressione, valorizzi altre cose, cioè , è vera questa cosa. Però parzialmente, perché, comunque ti avvii verso un declino, non sei in salita sei in discesa".

"E as desvantagens acho que a perda das memórias, o físico não é mais o mesmo, tua disposição não é mais a mesma... Deixa eu ver... As desvantagens são que tu não tem mais o mesmo pensamento mas, uma força assim, o calor da juventude, eu acho".

"E a questão também das limitações do corpo, quando você vai crescendo você não tem a mesma, a mesma disposição para fazer certas coisas, para fazer esportes ou vai ser, tu vai ser uma pessoa mais cansada..."

"Às vezes eu fico pensando quando eu estou deitado, eu fico pensando no tempo que eu era guri, eu corria, e brincava, e hoje eu não faço mais... Eu fico com uma tristeza... Uma tristeza danada".

Time

Aging is the passing of time / invecchiare è il passaggio del tempo / envelhecer é a passagem do tempo.

"Come ho detto prima mi sembra, io non mi son resa conto che il tempo è passato così velocemente mi son ritrovata alla mia età... Non accetto che mi si dica che faccio parte della categoria delle persone anziane, no"!

"E qui bene o male c'è, è invitabile, il tempo che avanza lascia i segni nel fisico, e quindi bisogna cancellarli bisogna".

"A idade a gente sabe que com o tempo vai inibindo..."

"Envelhecer é viver, de certa forma. Tempo... O passar do tempo, a vida a longo prazo".

"Queira ou não queira, a passagem do tempo vai indo, é obrigado a ficar velho. Então é isso, quem não fica velho morre".

"Porque é rumo ao fruto. Tem a semente, a fruta amadurece, apodrece e cai. Então eu vejo a velhice assim. É assim que eu vejo. É como uma fruta, uma árvore que dá um fruto maravilhoso, lindo, mas essa fruta vai ter um tempo, ela amadurece, se ninguém colher e comer ela vai apodrecer e cair".

4. Similarity matrix constructed from direct paired distance ratings

	Body	Family	Aging	Work	Death	Health	Time
Body	---						
Family	.27	---					
Aging	.90	.39	---				
Work	.50	.64	.40	---			
Death	.84	.35	.93	.31	---		
Health	.93	.66	.81	.64	.65	---	
Time	.72	.48	.96	.77	.89	.55	---

5. Clique distribution for the similarity analysis involving average similarities' matrix for social objects.

Clique level	Included elements					
96	aging	time				
93	body	health				
93	aging	time				
93	body	health				
93	aging	death				
90	body	aging				
89	aging	death	time			
84	body	aging	death			
81	body	aging	health			
77	work	time				
72	body	aging	death	time		
66	family	health				
65	body	aging	death	health		
64	family	work	health			
55	body	aging	death	health	time	
55	work	health	time			
50	body	work	health	time		
48	family	work	health	time		
40	body	aging	work	health	time	
39	family	aging	work	health	time	
35	family	aging	death	health	time	
31	body	aging	work	death	health	time

6. Prototypical analyses relative to social representations related to the social representation on aging.

Prototypical analysis for the stimulus word “body”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 7	beauty	30	1.83 (.43)	.77	-.54	beautiful	15	2.13 (.20)	.73	-.46
(32.1%)	health	24	1.75 (.42)	.83	-.67	care	9	2.00 (.22)	.78	-.56
	physique	13	1.62 (.62)	.15	.08	movement	9	2.11 (.22)	.89	-.78
	healthy	12	1.83 (.42)	1.00	-1.00	human	7	2.00 (.43)	.14	.71
	mind	10	1.50 (.70)	.40	.20	well-being	7	2.29 (.14)	1.00	-1.00
	sex	9	1.89 (.22)	.78	-.56					
F. < 7						life	6	2.33 (.33)	.83	-.67
						muscles	5	2.00 (.40)	.60	-.20
M1 = 40						man	5	2.00 (.40)	.20	.60
						sport	5	2.00 (.40)	1.00	-1.00
						strong	5	2.20 (.40)	.40	.20

Prototypical analysis for the stimulus word “work”

	Rank < 2					Rank ≥ 2			
	Type	Freq.	Rank (pr. 1)	Pol.	Neut.	Type	Freq.	Rank (pr. 1)	Pol.	Neut.
F. ≥ 11	fatigue	38	1.76 (.47)	-.58	-.47	satisfaction	27	2.11 (.18)	.96	-.93
(31.6%)	commitment	30	1.70 (.50)	.80	-.73	money (soldi)	21	2.00 (.38)	.71	-.43
						earning	16	2.00 (.25)	.81	-.63
						achievement	11	2.18 (.27)	.91	-.82
F. < 11	salary	7	1.57 (.43)	.86	-.71	money(denaro)	10	2.30 (.20)	.60	-.60
	activity	7	1.71 (.57)	.00	1.00	passion	8	2.00 (.38)	1.00	-1.00
M1 = 38	occupation	7	1.71 (.57)	.43	.14	obligation	5	2.00 (.40)	-1.00	-1.00
	responsibility	7	1.86 (.29)	.71	-.43	security	5	2.00 (.20)	.00	-.60
	frailty	5	1.00 (1.00)	-1.00	-1.00	pleasant	5	2.20 (.00)	1.00	-1.00
	office	5	1.40 (.60)	-.20	.6-	life	5	2.60 (.00)	.40	.20

7. Saturated log-linear model effects for inter-representation OtO relations within the representational system

All SCB connectors

Effect	Y^2	*df*	*p*
Activation	989.14	1	< .001
Order x Activation	.526	1	= .470
Activation x Object	37.181	2	< .001
Order x Activ. x Obj.	28.867	2	< .001
Global	1055.724	11	< .001

To reach df for Global, add 1 df for Order, 1 df for Object and 1 df for Order x Object

Description connectors

Effect	Y^2	*df*	*p*
Activation	509.400	1	< .001
Order x Activation	3.426	1	= .064
Activation x Object	11.136	2	= .004
Order x Activ. X Obj.	27.792	2	< .001
Global	551.754	11	< .001

To reach df for Global, add 1 df for Order, 1 df for Object and 1 df for Order x Object

Praxis connectors

Effect	Y^2	*df*	*p*
Activation	443.582	1	< .001
Order x Activation	.002	1	= .965
Activation x Object	13.402	2	= .001
Order x Activ. x Obj.	.927	2	= .629
Global	457.913	11	< .001

To reach df for Global, add 1 df for Order, 1 df for Object and 1 df for Order x Object

Attribution connectors

Effect	Y^2	*df*	*p*
Activation	98.035	1	< .001
Order x Activation	.301	1	= .584
Activation x Object	25.138	2	< .001
Order x Activ. x Obj.	16.567	2	< .001
Global	140.040	11	<.001

To reach df for Global, add 1 df for Order, 1 df for Object and 1 df for Order x Object

8. Relationship proportions between representation cognems

B. AGING - DEATH

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Death-Sadness	8	-1.55	15	.34	20	1.69	12	-.47	55	5.58	3	.134
Death-Fear	8	-1.	22	2.31	16	.68	8	-1.5	54	10.3	3	.016

B. AGING – NEW ACTIVITIES

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Health-Well being	18	1.22	7	-1.77	18	1.22	11	-.68	54	6.59	3	.086
Family-Support	17	1.71	2	-2.76	16	1.42	10	-.37	45	12.9	3	.005

B. AGING – SOCIAL EXCLUSION

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Death-Sadness	3	-2.64	13	.21	18	1.64	15	.79	49	10.35	3	.016
Death-Fear	3	-2.36	12	.38	13	.69	15	1.3	43	7.88	3	.049

B. AGING – GENERAL DECREASE

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Death-Sadness	3	-2.51	18	1.92	18	1.92	7	-1.33	46	15.39	3	.002
Health-Illness tr. prev.	5	-2.07	8	-1.21	22	2.79	14	.50	49	13.78	3	.003
Health-Medical care	9	-.67	10	-.37	16	1.42	10	-.37	56	2.73	3	.435

B. AGING - FAMILY

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Family-Love	16	-.12	3	-3.32	42	6.28	5	-2.83	66	58.48	3	.001
Family-Support	19	.62	6	-2.58	36	4.80	5	-2.83	66	38.12	3	.001
Family-Parents	15	.55	2	-3.05	26	3.61	9	-1.11	52	23.85	3	.001

B. AGING – HEALTH PROBLEMS

	A → B		A ← B		A ←→ B		A ← C → B					
A - Element	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	Occ.	S.Es	*N*	χ^2	*df*	*p*
Health-Medical care	11	-.22	12	.07	17	1.53	7	-1.39	47	4.32	3	.229

9. Full instructions (in Italian) of the discourse task in Study 4, for both conditions

Emphasis condition

Il testo seguente fa parte di una notizia pubblicata al sito *www.corriere.it* nel dicembre 2008. Leggila con attenzione e rispondi alle domande:

… Eurohealth è un progetto interdisciplinare europeo attivo da vent'anni che accompagna i cambiamenti nelle concezioni di salute in 15 Paesi europei. I dati più recenti ottenuti dal gruppo di ricerca italiano, coordinato dal Prof. Roberto Fontana, del Dipartimento di Psicologia dell'Università di Milano, mostrano che il 68% dei circa 1200 partecipanti intervistati dichiara che andare dal medico regolarmente per prevenire e trattare malattie e altri problemi è la misura principale per avere una buona salute.

Commenta il Prof. Fontana: "La medicina sta avanzando molto rapidamente, e le persone tendono a cercare i suoi servizi per garantire una vita sana, più frequentemente che in passato. I dati dell'ultimo Eurohealth dimostrano che, per la maggioranza degli italiani ed europei, le cure specializzate fornite da medici ed infermieri sono essenziali per la buona salute".

Il testo indica che per avere buona salute è importante avere appuntamenti con professionisti della salute ed avere accesso a cure mediche regolarmente. Perché queste cure mediche sono viste come importanti? Giustifica la tua risposta, scrivendo un breve testo (5 a 10 righe).

Relativization condition

Il testo seguente fa parte di una notizia pubblicata al sito *www.corriere.it* nel dicembre 2008. Leggila con attenzione e rispondi alle domande:

… Eurohealth è un progetto interdisciplinare europeo attivo da vent'anni che accompagna i cambiamenti nelle concezioni di salute in 15 Paesi europei. I dati più recenti ottenuti dal gruppo di ricerca italiano, coordinato dal Prof. Roberto Fontana, del Dipartimento di Psicologia dell'Università di Milano, mostrano che il 68% dei circa 1200 partecipanti intervistati dichiara di considerare la pratica di esercizi fisici e un'alimentazione sana misure più importanti per avere una buona salute che andare regolarmente dal medico o sottoporsi a cure mediche generali.

Commenta il Prof. Fontana: "Oggi la cultura della salute è preventiva. Andare dal medico o trattare malattie atraverso mezzi medici è una risorsa che viene utilizzata quando c'è qualcosa di sbagliato nell'organismo. Attualmente le persone preferiscono adottare uno stilo di vita alla salute piuttosto che cercare servizi di professionisti della medicina. Il dati dell'ultimo Eurohealth dimostrano che, per la maggioranza degli italiani ed europei, le cure specializzate fornite da medici ed infermieri non sono tanto importanti per la buona salute".

Il testo indica che per avere buona salute non è tanto importante avere appuntamenti con professionisti della salute ed avere accesso a cure mediche regolarmente. Perché queste cure mediche non sono più viste come essenziali? Giustifica la tua risposta, scrivendo un breve testo (5 a 10 righe).

10. Supplementary study related to Study 4

Design

2 (Situational context linked to context salience of <family-support> – Emphasis or Relativization) x 2 (R2 cognem - <aging-family life> or <aging-new activities>) independent measures design; 34 cases per cell; each participant provided responses for the two R2 cognems. Dependent variable: activation proportion of the whole set of SCB connectors related to forced associations involving the R2 cognems.

Sample

68 Psychology undergraduates (82.4% female), with age mean 21 years (*SD* = 2.5), 34 in each situational context condition.

Instrument

Similar to Study 4, with different cognems and discourse task.

Discourse task instructions (in Italian)

Emphasis condition.

Il testo seguente fa parte di una notizia pubblicata al sito *www.corriere.it* nel dicembre 2008. Leggila con attenzione e rispondi alle domande:

… Eurofamily è un progetto interdisciplinare europeo attivo da vent'anni che accompagna i cambiamenti nelle concezioni di famiglia in 15 Paesi europei. I dati più recenti ottenuti dal gruppo di ricerca italiano, coordinato dal Prof. Roberto Fontana, del Dipartimento di Psicologia dell'Università di Milano, mostrano che il 68% dei circa 1200 partecipanti intervistati dichiara che i membri delle loro famiglia si sostengono tra di loro di fronte alle sfide della vita quotidiana, rispondendo a necessità varie tali quali affetto, conoscenza, così come sostegno economico.

Commenta il Prof. Fontana: "La famiglia è una delle principali istituzioni su cui le persone contano per strutturare la vita. Così, è importante che i suoi membri si aiutino, perché la famiglia

compia la sua funzione sociale essenziale. E i dati dell'ultimo rapporto Eurofamily dimostrano che è proprio questo che succede alla maggioranza dei gruppi famigliari italiani ed europei".

Il testo indica che una delle principali funzioni della famiglia è il sostegno reciproco tra i suoi membri. Cosa intendi per questo ruolo di sostegno svolto dalla famiglia? Quale sono le conseguenze di questo sostegno? Giustifica la tua risposta qui sotto, scrivendo un breve testo (5 a 10 righe).

Relativization condition

Il testo seguente fa parte di una notizia pubblicata al sito *www.corriere.it* nel dicembre 2008. Leggila con attenzione e rispondi alle domande:

… Eurohealth è un progetto interdisciplinare europeo attivo da vent'anni che accompagna i cambiamenti nelle concezioni di salute in 15 Paesi europei. I dati più recenti ottenuti dal gruppo di ricerca italiano, coordinato dal Prof. Roberto Fontana, del Dipartimento di Psicologia dell'Università di Milano, mostrano che il 68% dei circa 1200 partecipanti intervistati dichiara di considerare la pratica di esercizi fisici e un'alimentazione sana misure più importanti per avere una buona salute che andare regolarmente dal medico o sottoporsi a cure mediche generali.

Commenta il Prof. Fontana: "Oggi la cultura della salute è preventiva. Andare dal medico o trattare malattie atraverso mezzi medici è una risorsa che viene utilizzata quando c'è qualcosa di sbagliato nell'organismo. Attualmente le persone preferiscono adottare uno stilo di vita alla salute piuttosto che cercare servizi di professionisti della medicina. Il dati dell'ultimo Eurohealth dimostrano che, per la maggioranza degli italiani ed europei, le cure specializzate fornite da medici ed infermieri non sono tanto importanti per la buona salute".

Il testo indica che per avere buona salute non è tanto importante avere appuntamenti con professionisti della salute ed avere accesso a cure mediche regolarmente. Perché queste cure mediche non sono più viste come essenziali? Giustifica la tua risposta, scrivendo un breve testo (5 a 10 righe).

<u>Procedure</u>

Identical to Study 4.

Data analysis

Identical to Study 4.

Results

Structural characterization

<Family-support>.

Rejection proportion: 89.7% (61).

Chi square test comparing situational context conditions: Yates $\chi 2$ (1, N = 68) = 0, p = 1.

<Aging-new activities>.

Rejection proportion: 51.5% (35).

Chi square test comparing situational context conditions: Yates $\chi 2$ (1, N = 68) = .235, p = .627.

<Aging-family life>.

Rejection proportion: 76.5% (52).

Chi square test comparing situational context conditions: Yates $\chi 2$ (1, N = 68) = 2.043, p = .153.

Cognem activation

Content analysis frequencies.

Emphasis.

Family is important for support – 30

Both family and external sources (friends) are important -3

Family and society have changed; support is found with friends - 1

Relativization.

Family is important for support – 0

Both family and external sources (friends) are important - 3

Family and society have changed; support is found with friends - 31

Response distribution – all 28 SCB connectors

	Situational context				
	Emphasis		Relativization		
R2 cognem	No	Yes	No	Yes	Total
<family life>	590	362	598	354	1904
<new activities>	577	375	606	346	1904
Total	1167	737	1204	700	3808
	1904		1904		

Saturated log-linear model for the whole set of SCB connectors

Effect	Y^2	*df*	*p*
R2 cognem	.000	1	= 1.000
Activation	231.439	1	< .001
Situational context	.000	1	= 1.000
R2 cogn. x Activation	.028	1	= .867
R2 cogn. x Sit. cont.	.000	1	= 1.000
Activation x Sit. cont.	1.530	1	= .216
R2 cog. x Act. x Sit. con.	.491	1	= .484
Global	233.488	7	< .001