

On Thematic Concepts and Methodological (Epistemological) Themata

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ABSTRACT

The concept of themata is transdisciplinary, bridging the domains of science and the humanities. Themata are basic elements of thought, usually taking the form of dyadic oppositions. They have several uses, among which a thematic concept and a methodological (epistemological) themata appear to be the most important ones in the theory of social representations. A thematic concept, as used in social representations, refers to the content and transformation of a specific dyadic opposition, for example, moral/immoral or man/woman. A methodological (epistemological) themata is a guiding principle of the discipline, which organizes and directs the issues of study along a specific perspective, for example, along analysis/synthesis or the Self/Other. While acknowledging the importance of a thematic concept, this article will emphasize the methodological or epistemological role of a themata. Specifically, it will focus on the Self/Other as a basic epistemological themata of the dialogical approach in social representations.

Keywords: themata; dyadic oppositions; a thematic concept; a methodological or epistemological thema; Self/Other.

The notion of ‘themata’ in the theory of social representations was used, for the first time, by Serge Moscovici in his lecture in Ravello in 1992 (Moscovici, 1993). Subsequently, the concept was explained and further developed in the article by Moscovici and Vignaux (1994/2000). In both publications Moscovici acknowledged that he had been inspired by the work on themata in physics by the philosopher of science Gerald Holton. Holton characterized themata as basic elements, usually taking the form of dyadic oppositions, of the structure and development of science. Consequently, Serge Moscovici placed the concept of themata ‘at the heart of social representations’ and likened them to ‘concept images’, ‘primary conceptions’ or ‘primitive notions’ (Moscovici and Vignaux, 1994/2000, pp. 176-177). However, despite his appreciation of the concept of themata, he only rarely mentioned themata in his subsequent work (e.g. in Moscovici, 2001; 2011). Nevertheless, we can easily ascertain that although Moscovici started using the notion of ‘themata’ only after he had familiarized himself with Holton’s work, in some ways he had been thinking along similar lines from the beginning of his career in social psychology. Jesuino (2008) notes that as early as in the first edition of *Psychoanalysis* (Moscovici, 1961), one finds forerunners to dyadic themata. Moscovici was well familiar with Marxist dialectics and it was this philosophical tradition that was already apparent in his first publications. For example, when he articulated social psychology as a discipline in movement, Moscovici conceived it as doubly orientated with respect to several kinds of dyadic micro-social versus macro-social oppositions in tension (Faucheux and Moscovici, 1962). These included oppositions like individuals versus groups, personality versus culture, psychology versus

sociology, and so on. Moscovici thought that as a hybrid discipline in continuous movement, social psychology should focus its interest on different ways of coping with tensions produced by these dyadic relations. Later on, still other dyadic oppositions in tension dominated Moscovici's thought, such as majority versus minority, common sense versus science, and knowledge versus belief. He considered that the study of tensions between such dyadic oppositions constituted the challenge to, and specificity of, social psychology. Thus we need to ask: if Moscovici's work had already been based on the idea of dyadic oppositions in tension, what did he find in Holton's concept that inspired him to place themata 'at the heart of social representations'?

The aim of my contribution to this Special Issue is twofold. First, I shall explore the relations between Holton's far-reaching analysis of themata in physical sciences and specific features of themata in the theory of social representations. Secondly, I shall examine the theoretical and empirical features of themata and their potentialities in the further development of the theory of social representations together with their practical implications.

FROM THINKING IN OPPOSITIONS TO THEMATA

The separated and integrated dyadic oppositions

Scholarly literature shows the omnipresence of thinking in polarities, dyadic oppositions and antinomies throughout the history of humankind, in and through different cultures and in diverse languages (for a review see Marková, 2003). Their widespread usage has been observed, commented upon, and analysed in philosophies, sciences, religions, cosmologies, myths and literature, as well as in daily thinking.

One can see that some dyadic oppositions and antinomies have been conceived as strictly separated from one another, and mutually exclusive. For example, Aristotle's law of non-

contradiction prohibits the co-existence of oppositions in thinking. The prohibition of co-existence of antinomies is embedded not only in the Aristotelian laws of thought guiding the logic of syllogisms, but the perspective that views dyadic oppositions as strictly separate, runs throughout the whole history of science in European scholarship. Components of dyadic oppositions are treated not only as separate from one another, but the concepts that are used to explain their natures, appear to be incompatible. In order to clarify this point, let us consider the dyadic opposition of continuity versus discontinuity that is often debated in sciences and humanities. In humanities, the questions are of the kind: Is the development of humans during their evolution, as well as during their individual lives continuous, showing gradual increments that are quantifiable? Or is the development discontinuous, and does it proceed in discrete stages?

In the nineteenth century, Charles Darwin believed that humankind progresses along an upward continuum and that human species differ from animals in degree, but not in kind. He thought that there are no fundamental differences between non-human and human species: the difference is quantitative and the gap 'is filled up by numberless gradations ... Differences of this kind between the highest men of the highest races and the lowest savages, are connected by the finest gradations' (Darwin, 1859/1874, p. 157). For him, evolution of the species was a continuous progression toward perfection. Similarly, the sociologist Emile Durkheim was attached to the hypothesis of continuity. Referring specifically to collective representations, Durkheim thought that throughout socio-historical development, primitive religious representations gradually transform into modern and scientific representations (Moscovici, 1998, p. 423). Piaget, following the Durkheimian line of thought, too, viewed child development as a continuous line from pre-logical to logical thinking (Inhelder and Piaget, 1955/1958).

In contrast, Durkheim's contemporary Lucien Lévy-Bruhl viewed the historical development of knowledge as discontinuous and as involving different kinds of logic in specific socio-cultural domains. Lévy-Bruhl's ideas were followed up by Luria and Vygotsky in their well-known studies in Uzbekistan in the nineteen thirties, in which the authors tested the dependence of cognitive development and abstract thinking on the socio-cultural conditions in which people live (Luria, 1979).

These examples show that the dyadic opposition between continuity and discontinuity can follow different paths: gradual quantifiable increments trail the line of a continuous development, while the concept of discontinuity singles out the dependence of development on socio-cultural conditions.

In contrast to viewing dyadic oppositions either as strictly separate as 'either-or', or as linked in a continuum, one can regard them as interdependent and as having a mutual effect on one another. This perspective was already established in the relation between Yin and Yang in ancient China. Throughout history, it was also embodied in traditional religions, myths and philosophies. The idea of interdependence between dyadic oppositions permeates the *Naturphilosophie* of the 19th century. It is also adopted by the numerous approaches taken by the social sciences of the 20th century, such as different versions of interactionism, intersubjectivity and dialogical approaches (e.g. Rommetveit, 1974; Linell, 2009; Gillespie and Cornish, 2010).

Thinking in oppositions and themata

Human thought is heterogeneous and it takes different forms. These could involve problem-solving, the formation of concepts, the search for similarities and differences between events, objects and people, the creation of images, thinking in dyadic oppositions, and many others.

Among these different forms, thinking in dyadic oppositions is associated with the concept of themata. Gerald Holton (1973; 1974; 1975; 1978) makes it clear that in physical sciences the dialectics of dyadic oppositions is fundamental to his idea of themata. Themata often appear in an antithetic mode, such as ‘evolution and devolution, constancy and change, complexity and simplicity, reductionism and holism, hierarchy and unity, the efficacy of mathematics (for example, geometry) versus the efficacy of mechanistic models as explanatory tools’ (Holton, 1975, p. 330).

But what is the origin of themata? Holton (1978, p. 22) recognizes the need to answer this question and he suggests that one should look for connections between the individual and his/her community. He assumes that themata have both a psychological and a collective component. In and through interdependence between the psychological capacity of the individual and social circumstances, themata can be understood as having a life-cycle; they arise, are maintained and fade away. However, he points out that these processes await a much deeper exploration. Holton’s (1978) analysis of scientific imagination, which is based on single case studies of physicists, draws attention to the unique nature of individual creativity within the scientific community.

Although any dyadic opposition has the potential to become a thema, it does not mean to say that all dyadic oppositions do become themata. Having been concerned specifically with the physical sciences, for Holton, only those dyadic oppositions, which function as conceptual elements underlying the structure and development of physical theories, rise to themata. When this happens, themata are long-lived and endure through the revolutionary changes of Kuhnian (Kuhn, 1962) scientific paradigms (Holton, 1975, p. 333). The researcher, committed to a particular thema, disregards Kuhn’s idea of paradigmatic revolutions due to the fact that he/she

gets stubbornly attached to a particular thema. In fixing attention on a thema or antithema, the weight of the researcher's obstinacy steers his/her activity. The attachment to a thema does not necessarily have a positive influence on the researcher's thought: while in some cases it may facilitate his/her creative imagination, in other cases a thema leads the researcher to blind alleys because of immovable convictions that possess his/her mind. Themata are often implicit rather than explicitly stated: they are hardly ever observable; they are held unconsciously rather than reflectively deliberated.

Themata are not only elements of scientific theories, but Holton argues that they underlie a broad spectrum of human thought, whether scientific or non-scientific. They arise from humans' general imaginative capacity (Holton, 1973, p. 214). This is a fundamental claim because it leads Holton to assume that in a deep sense science is a cultural and historical product: 'Science is in a dynamic interaction with the total intellectual activity of an age ... it may underlie the work of the artist just as it penetrates into the explanation a mother gives to her child to help him understand the way things move' (Holton, 1974, p. 202). This further implies that the traditional division between sciences and humanities is grounded in an oversimplified assumption that science is no more than a purely empirical and logically analytic process. This, Holton argues, is a wrong presupposition and therefore, the separation between sciences and non-sciences should be abolished. But such a claim is very provocative. Have not scholars since the eighteenth century vehemently argued that the humanities and natural sciences are of different kinds, and that humanities must be treated, conceptually and empirically, differently from the natural sciences?

Themata integrate natural sciences and humanities

The proposal that natural and human sciences should be treated as fundamentally distinct from one another was made by the eighteenth century scholar Giambattista Vico (1709/1965). Concepts and methods that are applicable to the former cannot be extended to the latter. In contrast to natural sciences, which explore objects in the world as related by the laws of causality, human sciences study human agency, creativity and imagination. Humans create their social reality in and through reflection and self-reflection. Vico's perspective was adopted and extended by the nineteenth century philosopher Wilhelm Dilthey who coined the terms *Naturwissenschaften* (natural sciences) and *Geisteswissenschaften* (human sciences). This view presupposes that the concepts and methods of natural sciences are totally inappropriate for human sciences, because they reduce humanity to physical objects and subjects it to mechanistic causal laws (e.g. Gadamer, 1975).

However, when Gerald Holton argues that the division between sciences and humanities should be broken down, he has in mind a very different problem. As noted above, according to Holton (1974, p. 202), science is a cultural and historical process and product, which means that 'science is in a dynamic interaction with the total intellectual activity of an age'. This perspective contrasts with the reductionism existing *within* natural sciences. Holton argues against the view that natural sciences are based on no more than empiricism, formal analytic procedures, and measurements. He insists that such a narrow conception of science cannot account for the invention, discoveries and the growth of knowledge. As a cultural product, science is based on human intelligence and imagination. Themata, both in science and non-science, have in common these marks of human intelligence and its general imaginative capacity. Themata are shared by members of a community, but each individual develops a thema according to his/her idiosyncratic experience and inventive capacities.

In conclusion, the argument for separation of natural sciences and humanities refers to the fact that the study of humans is incompatible with that of mechanisms and objects in physical sciences. In contrast, Holton's call for the integration of natural sciences and humanities refers to the perspective that both undertakings arise from culture. They are both underpinned by human intelligence in and through diversities of thinking and imagination. Themata, which are elements of the development of scientific theories, are also features of non-scientific thinking. Therefore, thematic thinking integrates, rather than separates, natural sciences and humanities.

Themata in the theory of social representations

Holton notes that although themata appear in physical sciences most commonly as dyadic oppositions, sometimes they also occur as either single or triplet elements. He comments that, in fact, he could find no more than fifty themata in physical sciences and he believes that it would not be possible to identify more than a hundred. Moreover, it is very rare to notice, in the history of science, the appearance of a new thema.

If we turn to themata generating the theory of social representations, we find a totally different picture. Dyadic oppositions, i.e. the source ideas of themata, are part of common sense thinking and they may refer to any physical, biological or social antinomies embedded in history and culture (e.g. Vico, 1744/1948; Husserl, 1913/1962; Lindenberg, 1987). In this sense there are no limits on the number of dyadic oppositions in daily thinking and language. They have become established in and through lived experience over generations: they operate at a non-conscious level; they are not observable; they are implicit. As they underlie common sense thinking, they are like potentialities waiting to enter into speech and communication when suitable

circumstances arise. Previously, I referred to such dyadic oppositions waiting to be thematised in speech and communication as proto-themata (Marková, 2007).

For example, a particular society implicitly develops, over generations, norms of moral and immoral conduct. When that society internalizes such norms of moral and immoral conduct, dyadic oppositions of moral/immoral become stabilized, taken for granted and they regulate the activities of individuals and groups. Since such norms of conduct are implicitly established, there is no need for them to be explicitly raised in public discourses unless they are violated. In other words, they are proto-themata. However, if due to social changes the norms of morality and immorality are modified, or if a particular conduct is viewed as ambiguous, the borders between morality and immorality become blurred. As a result, morality and immorality become a subject of debates and controversial arguments. Thus, a proto-thema, in this case a dyadic opposition morality versus immorality, turns into a thema: it is brought into language, is thematised and starts generating social representations (Marková, 2007, p. 171).

In natural sciences, themata and thematic analysis underlie the structure and growth of theories, but the discourse of these issues is usually restricted to scientific communities. In contrast, a thematic analysis in social representations takes place in the public discourse. In and through public disputes the content of themata responds to current problems and within the social, political, cultural and historical contexts the content of themata transforms and innovates itself. Themata in social representations are created and innovated in and through language and communication: humans express themata in narratives, explanations, hypotheses, arguments and justifications. The social process of thematisation takes place both collectively and individually. Its collective component is embedded in culture, social events and history, and the individual component is unique to each person. Thematisation has its phases that rise, are developed and

may fade away or totally disappear when themata are no longer relevant in public discourses. This is why, in order to emphasize the interdependence between the individual agency and community in the theory of social representations, Mario von Cranach coined the term ‘individual social representations’ (e.g. von Cranach, 1995). Although there are by definition collective components in social representations, individual agents express these collective components in a unique manner.

Let us return to the question I posed at the beginning of this article, that is, what inspired Moscovici to adopt the concept of Holton’s themata, if he already had the idea of dyadic oppositions in tension? In my view, it is Holton’s thematic analysis showing how the researcher goes beyond dyadic oppositions, how themata are transformed in and through interdependence between the individual agency and collective activities that led Moscovici to place themata ‘at the heart of social representations’.

DIFFERENT USES OF THEMATA

So far, I have spoken about themata as if they had a singular role and specifically, as if they all were concerned only with the transformation of thematic content. The thematic content, that is, the use of themata as a thematic concept or the thematic component of a concept, however, is only one way in which themata are used (Holton, 1975). Holton makes an important distinction with respect to the three ways in which themata are used in physical sciences and thus playing different roles in thematic analysis. In addition to a thematic concept where, according to my interpretation of Holton, the emphasis is placed on the development and transformation of the content of the thema, the second usage refers to a methodological thema. A methodological

thema has an epistemological role: it guides the direction of the pursuit of science. The third use of a thema, according to Holton, refers to a thematic proposition or a hypothetical thema. This last usage lies between the former two uses, and it can be considered as a potential for the further development of a particular physical theory.

Before continuing with the discussion of diverse usages of a thema, let us make it clear that Holton does not place themata into different categories, that is, he does not argue that some themata fulfil the role *only* as thematic concepts and others *only* as methodological themata. Rather, one and the same thema can be used in different ways and can serve different purposes, for example, as a thematic concept or as a methodological thema. What matters, is whether the researcher focuses on a particular thema in terms of the transformation of thematic content or whether he/she uses that thema as an epistemological guide to the development of a theory.

In the remainder of this article I shall focus on the two former usages, that is, on a thematic concept and on a methodological (epistemological) thema, because these two kinds of usage are relevant in the theory of social representations.

Thematic concepts

When Serge Moscovici referred to themata, he conceived of them as thematic concepts and he placed emphasis on the content of thematisation in and through communication. For example, he analysed the dyadic opposition *man/woman* (Moscovici and Vignaux, 1994/2000) or he referred to dyadic pairs like *nomadic/sedentary*, *right/left* or *clean/dirty* (Moscovici, 2011) in the history of 'Roma'. The thema *man/woman* has had a very long career in the history of humankind and has undergone tremendous variations with respect to thematisation of its content across cultures and in history. For example, it could be thematised as 'feminism' versus 'male chauvinism'

(Moscovici and Vignaux, 1994/2000), or as ‘female ethics of care’ versus ‘male concern with rights and rules’ (Gilligan, 1982). This means that while the dyadic oppositional category, in this case, *man/woman* remains stable, its content varies: it is dependent on questions that the researcher, professional or a lay person poses about men and women. These questions are partly dependent on culture, political circumstances, fashions, demands for equality between the sexes, and so on. Therefore, social representations of man and woman are generated on the basis of thematisation of the content of the dyadic opposition *man/woman*.

Let us consider the example of the ‘Roma’. Themata that are related to social representations of ‘Roma’ have been constructed around *nomadic/sedentary*, *pure/impure* and thematised either negatively referring to Gypsies as beggars and delinquents living outside the law, or positively as musicians and travelling entertainers (Moscovici, 2011, p. 457). Having been established and maintained for centuries, such themata justify the actions of societal majorities, for example, on the one hand, the taboo of contact that perpetuates the discrimination of ‘Roma’. On the other hand, in order to accord with the human rights, the legal protection of ‘Roma’ families and groups has been established in European countries (Moscovici, 2011, p. 459). Here again, social representations of ‘Roma’ are generated from the contents of themata that prevail in a particular culture, political circumstances, traditions, and so on.

There is no need to develop the discussion of thematic concepts and transformation of their contents any further because this is the only use of themata that has been explicitly established in the theory of social representations and which, so far, has been overtly referred to in this article. Instead, I propose to pay attention to methodological themata. They steer the researcher to *the search for knowledge from a particular perspective*: they provide guidance for

the scientific development in a particular domain. As such, they affect the way in which the concrete content themata, are thematised and transformed.

Let us first consider the use of Holton's adjective 'methodological'. Holton's use of this adjective refers to the 'methodology' as a domain of scholarship concerned with theoretical analysis of the corpus of methods and therefore, with the direction in which the search for knowledge takes place. While in psychology the term 'methodology' is often confused with that of a 'method' (as for example in the question 'which methodology do you use?'), Holton's 'methodological' does not refer to single methods as the tools of analysis or techniques. Methodology is a branch of knowledge and therefore, its meaning is epistemological. For example, Holton examines analysis and synthesis as a methodological thema that guides the researcher or a professional either towards the detailed analysis of the phenomenon in question or towards holism and the broadly based concept of knowledge. Let us consider Holton's (1978) example of a methodological thema: analysis versus synthesis. Holton maintains that throughout the history of scholarship, analysis and synthesis have been methodological practices that have permeated the works of philosophers and scientists from Plato and Aristotle through to Newton, Kant, Hegel and Einstein, as well as the techniques in chemistry, logic and psychology, among others. Analysis and synthesis are cultural products, some of which are comprehended as mainly analytical and others as mainly synthetic. Holton (1978, p. 112) characterises these methodological themata by stating that '[T]he synthesis provides a framework for interpretation and analysis of particulars that help to propel thought and feeling to important truths'. Beyond this basic characteristic, analysis and synthesis have a variety of meanings in different domains of scholarship and in professions, in different cultures and historical periods. Holton points out that although one can easily identify both analysis and synthesis in various cultural products, analysis

appears as more prominent. He reminds us, however that it is vital to understand the full imaginative and intellectual power of each of these two thematic components rather than be drawn by their asymmetric status, which may mislead scholars and direct them to reductionist approaches (Holton, 1978, pp. 112-113). Commitments of intellectuals and professionals either to analysis or synthesis is reflected in other opposing thematic concepts such as reductionism versus holism, dichotomisation versus unification, fragmentation versus wholeness, and differentiation versus integration.

Holton's example of analysis and synthesis as a methodological thema clearly draws attention to its epistemological role in various branches of sciences and scholarship. Therefore, in order to avoid confusion, in the remainder of this article, when referring to methodological themata in social representations, I shall substitute the term 'epistemological thema' for Holton's 'methodological thema'.

Epistemological themata

Let us recall that while, according to Holton, thematic concepts develop and structure the content of scientific theories, methodological (epistemological) themata express rules and laws of science, or they guide the direction in the pursuit of science. I noted above that one and the same thema can be used in diverse ways and can serve different purposes; it can be used both as a thematic concept and as a methodological thema. The particular use of a thema depends on the way the researcher or professional formulates the problem: Does he/she focus on a particular thema in terms of the transformation of thematic content or does he/she use that thema more broadly as an epistemological guide with respect to the development of a theory?

In order to clarify the point that a thema can be used both as a thematic concept and as a methodological (epistemological) thema, let us return again to the dyadic opposition of continuity

versus discontinuity. The Uzbekistan study of Luria and Vygotsky (Luria, 1979) was designed to test the idea of discontinuity based on the Lévy-Bruhl's belief that primitive thinking uses a different kind of logic than the thinking of modern people. For example, in contrast to modern logical thinking, primitive thinking tolerates contradictions. In other words, there is a discontinuity between pre-logical and modern forms of thinking. Luria and Vygotsky tested this hypothesis by studying the thinking of uneducated people and of those who had already received education in Soviet schools. Focusing on numerous problem-solving exercises and perceptual tasks, the authors found that education quickly led to changes in people's thinking, making it more akin to the thinking of modern people. From the point of view of thematic analysis, the Uzbekistan project showed the use of the thema of discontinuity as a concrete thematic concept: *it focused on the structure, content and the development of thinking as a discontinuous process in specific socio-cultural contexts*. Rather than studying thinking as an upward process which, in terms of Darwin 'is filled up by numberless gradations', the Uzbekistan study showed the interdependence between forms of thinking and socio-cultural conditions. Therefore, in this case, discontinuity was used as a thematic concept.

Equally, let us consider an example of continuity and discontinuity as thematic concepts in physics. Gerald Holton explored the problem that, at the beginning of the twentieth century created considerable disputes among physicists in their attempts to understand the duality of light. The problem with which physicists struggled, concerned the fact that the light presents itself sometimes as 'corpuscles' and sometimes as 'waves'. Depending on their allegiance either to the 'corpuscles' or the-to 'waves', researchers tended to explain the 'same' experimental data in different ways and vehemently disputed each other's interpretations. One can say that those physicists, who were attached to the 'corpuscular' perspective, viewed a different structure and

content of light than those who viewed light as ‘waves’. In this case, as I interpret this case, continuity (waves) and discontinuity (corpuscles) were used as thematic concepts.

However, in 1927 the Danish physicist Niels Bohr proposed the solution to this duality by suggesting that the thema and antithema are not separate, but complementary. Bohr proposed that whether one interprets the light as corpuscles or as waves depends on the experimental conditions that the researcher creates. Although originally Bohr’s proposal concerned the themata of continuity and discontinuity of light, and therefore, of thematic concepts, subsequently, in Bohr’s theoretical and empirical work, complementarity obtained the status of an epistemological thema: complementarity became a guiding principle of the theory of knowledge.

Bohr conceived complementarity as a perspective according to which the agent or subject and the phenomenon under study or object, are interdependent. Let us recall that the idea of interdependence that defines complementarity, was already embedded in Yin and Yang in ancient China. Having been attracted by the Chinese concept of complementarity, Bohr chose the *yin-yang* complementarity of opposites *Contraria sunt complementa* (Opposites are complementary) as the symbol on his coat of arms when he was knighted. However, Bohr’s concept of complementarity goes far beyond the Chinese concept. While Yin and Yang return cyclically to their beginnings after they have achieved maximum, Bohr’s complementarity is infinitely open, providing space for new ideas and imagination.

In Bohr’s conception the agent (the subject or the measuring instrument) and the phenomenon (the object of measurement) are in a unique and complementary relationship. Due to the uniqueness of complementary relationship between subject and object, Bohr (1949, p. 210) explains that due to the unique relations between a specific subject and object, ‘evidence obtained under different experimental conditions cannot be comprehended within a single picture’.

Niels Bohr went much further in his conception of complementarity. For him, the principle of complementarity was not just a scientific concept, but he conceived it as an epistemology in a much broader sense: it was an epistemology of life (Rosenfeld, 1963/1979, p. 535; Marková, 2013). His epistemological stance applies not only to physics but to other domains like psychology, biology and anthropology. Each of these domains is concerned with its own kinds of continuities/discontinuities, stabilities/variabilities, and so on. Each domain involves specific subjects/objects which are based on different conditions for observation and description.

In the article on 'Science and the unity of knowledge' Bohr (1955) maintains that he is not searching for a universal description and observation of phenomena, but for specific conditions that apply to specific subjects/objects. Complementarity is applicable to various spheres of life, and conditions for description differ from one domain to another. Equally, psychological observations, biological and anthropological domains are based on different conditions for observation and description. So, there is no possibility of reducing one field to another.

In social psychology, Ragnar Rommetveit (1974, p.37) formulates his perspective on communication as complementarity. He refers to complementarity in terms of a mutual engagement of participants in communication. Complementarity arises from a temporarily shared social environment and synchronization of intentions between communicative participants; the speaker is listener-orientated and the listener is speaker-orientated, both attuned to each other. In situations of a nearly perfect complementarity, words may be superfluous and participants may communicate by gestures, gaze and use words only sporadically. Complementarity in this sense focuses on understanding and taking the position of the other.

While Rommetveit's concept of complementarity involves an attempt to reconcile oppositions and synchronize speakers' intentions, Niels Bohr's concept of complementarity preserves speaking in diverse languages, emphasizing that it is in and through the dynamics of tension that complementarity is maintained. Similarly, for Mikhail Bakhtin, dialogical relations are not engaged solely in the search for intersubjectivity conceived as a peaceful contemplation. Instead, cognitions and affects are in tension; they clash, judge and evaluate one another (Bakhtin, 1981, p.314). According to Bakhtin, oppositions coincide in the world of becoming, in which there are no hard boundaries between objects, words or cultures. Bohr's and Bakhtin's ideas of interdependence between subject/object are infinitely open processes.

In conclusion I suggest that by proposing complementarity, Niels Bohr upgraded a thematic concept which refers to a specific and concrete use of thema (e.g. corpuscles. waves) to a methodological (epistemological) thema which not only provides rules of science and guides its direction. More generally, the principle of complementarity has become an epistemology of life.

The Self/Other as an epistemological thema of the dialogical approach to social representations

We have already seen that the subject/object relations form one of the fundamental features of Bohr's complementarity as epistemology (see also Katsumori, 2011; McEvoy, 2001; Favrholt, 1999, pp. xxiii-xlix.). I noted that this relation refers to the perspective according to which the agent and the phenomenon under study are interdependent, and that the agent (*the subject or the measuring instrument*) and the phenomenon (*the object of measurement*) are in a unique and complementary relationship. Bohr (1934/1961, p. 117) expressed this perspective as follows: 'the

relation between subject and object ... forms the core of the problem of knowledge'. But what is new about this claim and how should we interpret it?

At first sight, one might think that there is nothing new about Bohr's claim. The relation between subject and object has been conceived as a core problem of knowledge throughout the history of European philosophy. Yet, at a deeper level, there is a fundamental theoretical contribution of Niels Bohr. René Descartes, John Locke and their followers who were preoccupied with the core problem of knowledge, treated subject (the knower) and object of knowledge (the known) as being totally separated from each other. According to these conceptions, the subject's (the knower's) cognitive capacity to process information enabled the formation of knowledge of external stimuli, which were conceived as totally independent of the knower. Niels Bohr rejected such one-sided separation of subject and object and instead, he treated them as complementary. But complementarity has two faces. Let us explain. First, while interaction between subject/object was one of the basic presupposition for Bohr's epistemology, it was also essential that subject and object were distinct from each other. In order to carry out a scientific exploration, the subject and object must be observed and described as distinct and separate - otherwise it would be impossible to discover anything either about the subject or about the object. Second, and in contrast to Descartes, Locke and their followers, the subject and object were dependent on one another. One component can be understood only through the other, like figure/ground: this is the meaning of their unique relation.

The idea of complementary relation between subject and object both as distinct and interdependent – or between the Self- and Other – is also fundamental in Mikhail Bakhtin's dialogicality. In reflecting on Self–Other perspectives, Bakhtin (Bakhtin, 1979/1986, p. 78) speaks directly about the importance of distinction between the Self and Other and against the

idea of fusing of the Self and the Other. While they form a unique relationship, they are also distinct from one another.

The idea of interdependence between the subject (knower) and the object (the known) is a basic epistemological principle of interactional theories of knowledge such as the *Naturphilosophie* of the 18th and nineteenth centuries, American pragmatism, Gestalt psychology, phenomenology, Moscovici's theory of knowledge and dialogicality, among others. Let us now consider how the thema of complementarity of subject/object related to the theory of social representations. Previously I conceived (Marková, 2003; 2016) a close theoretical relation between Moscovici's interactional theory of knowledge and dialogical epistemology. Both are based on particular kinds of subject/object relations, that is, the Self/Other.

The dialogical mind is the mind in interaction with others, i.e. with individuals, groups, institutions, cultures, and with the past, present and future (Marková, 2016). Let us first consider the complementary role of the Self/Other in terms of distinction and interdependence in some research on social representations.

Our research on HIV/AIDS in Scottish prisons and in studies of haemophilia showed that the Self- and Other-awareness (Marková et al, 1990) and the Self/Other distinction (Marková et al., 1995) were the basic oppositional dichotomies in our work and we treated them as principal concepts that gave the meaning to our research. On the basis of the Self/Other distinction we derived other dichotomies, such as perception of control versus risk, sympathy versus blame, the Self low risk versus the Other high risk, among others. Our studies of the perception of risk in Scottish prisons showed asymmetries of the Self- and Other-perception. Risks of HIV/AIDS concerning Others were persistently rated as higher than the perceived personal risks. This seems to corroborate once again the idea that evil is in Others rather than in the Self (Marková et al.

1995). In the case of haemophilia, we found that for many patients the knowledge of the disease and its spread was less important than their fear that they could be rejected by Others if the fact became known that they had been infected by HIV (Marková et al. 1990). Equally, although patients and their families were well aware that the virus does not spread by daily contact, the families tried to keep a 'clean house' and they associated the disease with uncleanness. These representations were mixtures of traditions, established common sense knowing, and the Self/Other interactions. While at the time of this research we had not been aware of the notion of themata, we found later on that the Self/Other distinction was compatible with the concept of themata. It appeared that in these studies the Self/Other served as a central thema from which other oppositional dichotomies were derived, such as clean/dirty, control/risk, goodness in the Self/evil in Others, and so on.

The centrality of the thema Self/Other has been most systematically explored in two research teams. The first team led by Hélène Joffe has explored social representations of risks of the emerging infectious diseases, climate changes and earthquakes (e.g. Joffe, 2011; Joffe & Haarhoff, 2002; Joffe, Washer and Solberg, 2011; Joffe et al. 2013; Smith and Joffe, 2013; Smith, O'Connor and Joffe, 2016). In these studies the authors draw on the interdependence of the Self/Other showing that the Self associates danger with the Other. The authors present the perspective according to which the Self/Other thema plays a major role in common sense thinking and underlies other content themata related to coping with risk and dangers such as identity-protection/identity-spoiling, clean/dirty, moral/immoral, among others. Moreover, the authors show that the Self/Other thema is thematised in unique ways to fit different cultural and socio-historical conditions. For example, the nature of thematisation of the Self/Other is largely determined by prevalent societal values focusing either on the individual or collective; it is

related to spatial and time closeness and to distancing oneself from situations that are far away in time and space. Taking responsibility, blaming, feeling vulnerable, trusting and distrusting Others are determined by internal and external factors.

The other research team lead by Gail Moloney, also focuses on the centrality of the Self/Other in studying organ and blood donation (e.g. Moloney, Hall, and Walker, 2005; Moloney, Williams, and Blair, 2012; Moloney, Walker, and Charlton, 2013; Moloney, Gamble, Hayman and Smith, 2015). The authors emphasize that the social representational fields are driven by the ways these issues are understood in particular contexts, time and place. They show the co-existence of contradictory understanding of the issues in question which manifest themselves as cognitive polyphasia within single representations. Cognitive polyphasia expresses tensions created by fear of pain and danger to the Self, and at the same time by willingness to help Others, improve their health prospects and lives.

On the basis of these empirical studies, as well as of reflections on other research in social sciences (e.g. Moscovici, 1961/1976; Nafstad, 2015; Nafstad and Rødbroe, 1999) we can conclude that the Self/Other thema can be regarded as an vital epistemological thema from which numerous content themata (thematic concepts) can be derived. The epistemological thema Self/Other, together with content themata specific to concrete problems under study, generate social representations with their unique characteristics. The Self/Other interdependence underlies daily thinking, common sense and communication.

Are all social representations underpinned by themata?

I noted above that according to Holton, the number of themata in physical sciences is restricted. Moreover, while themata form an important concept in physical sciences and their history, there

are also theories where themata do not play any prominent role (Holton, 1975), and science develops along different lines.

In contrast to physical sciences, the number of themata in daily thinking is limitless. If ‘themata are at the heart of social representations’, does it mean that all social representations are underpinned by themata? On the one hand, the answer could be ‘yes’ because dyadic oppositions, which are the source ideas of themata, are part of common sense thinking, in which social representations are embedded. On the other hand, as noted above, thinking takes on different forms, and thinking in oppositions, which underlies themata, is only one of these forms. What we can say with certainty is that social representations based on interdependencies between the Self and Others are filled with tensions, conflicts and negotiations, and that these are underpinned by themata. We could suppose that most social representations in public discourses are of these kinds.

Nowadays, there are numerous approaches to the study of social representations and these are based on diverse perspectives. For example, some empirical studies explore attitudes and opinions, or carry out comparative studies in many different countries, and refer to these as social representations. In my opinion, these studies are far away from the concept of themata because, as emphasized in this paper, themata are based on unique relations between the subject and object or the Self and Others and the surveys of opinions and attitudes are not underpinned by these assumptions.

In contrast, the studies of social representations, which are based on structural approaches of the Aix-en-Provence School, with their emphasis on the central core and periphery, refer to themata. Jean-Luc Abric (1994) characterized the central core of social representations as being embedded in historical, ideological and sociological conditions and in the collective memory of

the group and he argued that this accords with the concept of themata (personal communication). In referring to a series of fine studies by Flament, Abric and their colleagues, Serge Moscovici commented that these studies show qualities like ‘equality’ or ‘friendship’ as core notions of social representations. In these, ‘initial themata usually generate several core notions ...one thema can sometimes lead to another thema and they both become specified in the nucleus of the emerging social representation’ (Moscovici, 2001, p. 31). However, meticulous studies of these social representations, for example, of the bank (Abric and Verges, 1996; Abric, 2003) do not explain at all in what ways these cores and peripheries apply to historical, political and sociological conditions. The core of the bank (e.g. agreement of the loan, keeping money in the safe) and the periphery (e.g. financing enterprises, provision of money, managing your bank account) (Abric, 2003) are no more than descriptions of contemporary functions of the bank; they do not provide a dynamic thematic analysis. Thus, despite Serge Moscovici’s high approbation of these studies, if structural approaches wish to claim that they are based on themata, they must respond to a number of challenges, for example:

- they need to explain whether the static central core and themata refer to the same elements
- in what ways the static central core reflects the dynamic nature and transformations of themata
- what role does the central core play in thematisation in and through communication

In contrast to the structural approach, and without referring to social representations and themata, Gillespie and Cornish (2014) provide an analysis of the Northern Rock bank run in the UK during the financial crisis 2007. Their analysis of the bank is based on the interdependence between the Self/Others, that is, between the individual depositors and the financial institution that ‘betrayed’ them. In this particular case the Self/Other is thematised in terms of trust/distrust

and security/insecurity; Gillespie and Cornish show the ways in which the two kinds of thematised oppositions translate themselves into a series of practical activities. The authors state: 'In order to understand how taken-for-granted trust transforms into thematised distrust one needs to analyse the unfolding situation as propelled by the generation of new meaning through symbolic and significant symbolic communication' (Gillespie and Cornish, 2014, p.96). The authors view the bank not only as a here-and-now institution, but as an institution which has developed in history in and through the Self/Other dependencies of trust/distrust and security/insecurity.

CONCLUSION

In this article I have referred to the concept of themata across sciences and humanities as elements underlying both scientific and non-scientific thinking.

- Themata arise usually, though not exclusively, from dyadic oppositions in thinking. They reach far beyond sheer catalogues of dichotomies: thematic analysis shows the development and roles that themata play in science and in daily and professional life.
- Themata originate from the interdependence between the individual and socially shared thinking and therefore, they have a psychological and a collective component. Gerald Holton's scientific imagination, which is based on single case studies of physicists, shows the unique creations of individual scientists that are rooted in underlying and collectively shared themata. Likewise, in the theory of social representations, themata arise from the interdependence between the thinking and communication of individual agents and the collectively shared activities.

- Themata are embedded in traditions and collective thought; they are implicitly transmitted as proto-themata from generation to generation. Once they become explicit, they turn into reflective themata and are formulated as narratives, explanations, hypotheses, arguments and justifications.
- Themata are forms of ‘irresistible beliefs’ (Moscovici, 1993). They are convictions which the individual holds with obstinacy and they commit him/her to a particular kind of explanation for a phenomenon while disregarding another explanation. In science, therefore, themata can either mislead a scientist or they can facilitate his/her thinking. In contrast to science, social representations are based on forms of daily thinking and common sense, in which themata play vital roles. Humans create their social reality in and through communication, symbolic meanings and social actions. Themata are of long duration; they rise and fall in prominence, according to changes in their relevance to specific social conditions.
- Themata are used in different ways. Holton distinguishes between the concept themata, methodological themata and hypothetical themata. Holton’s term ‘methodological’ does not refer to a single method but to methodology as the scientific analysis of the corpus of methods. It carries the epistemological meaning for a scientific inquiry. Therefore, I have substituted the term ‘methodological thema’ by an ‘epistemological thema’ when referring to social representations.
- While the thema Self/Other can be used as a thematic concept focusing on the content of themata and transformation, for example, trust/distrust, risk security, it is above all, the Self/Other used as an epistemological thema which gives direction to the research in social representations. Used as an epistemological thema, the Self/Other is not just one of

the themata to be explored, but it is the thema that underlies thinking and imagination. From this epistemological thema other thematic concepts with specific contents are derived, and their transformations accomplished. This is why the epistemological them Self/Other has a unifying role in the theory of social representations.

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