

Introduction: Methodological Individualism, Structural Constraints, and Social Complexity

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Abstract: This special issue of COSMOS+TAXIS is devoted to the non-reductionist variant of methodological individualism and analyses its nature and heuristic power from both an historical and methodological standpoint. It opposes the dominant assumption that social scientists need to get rid of the individualist tradition and develop alternative approaches because of the devastating arguments provided against reductionism by philosophy and systems theory. A basic assumption is that the tendency to equate methodological individualism and reductionism is both historically and logically untenable and that, as a consequence, arguments against the latter do not undermine the former.

Keywords: complexity, holism, methodological individualism, reductionism, social ontology

TWO VARIANTS OF METHODOLOGICAL INDIVIDUALISM

Methodological individualism does not have a good reputation in some sectors of the philosophy of social science because it is often regarded as committed to reductionism, where reductionism means an atomistic theory of society that is mistaken because it naively denies both the systemic nature of the social world and the structural constraints imposed on the individuals by socio-cultural factors. Despite its popularity, the interpretation of methodological individualism in terms of reductionism must be rejected because reductionism—which has been theorized by the social contract theory and some atomistic economic approaches—is only the more simplistic variant of methodological individualism (see Boettke 2012, p. 147; Boettke and Candela 2015; Demeulenaere 2011, p. 11; Di Iorio 2015, pp. 89-92; 2016; Hayek 1948 pp. 1-32; Jarvie 2001,

pp. 117 ff.; Manzo 2014, p. 21; Tuomela 1990). This variant is criticized and challenged by a non-reductionist one, which is rooted in the Scottish Enlightenment and includes authors belonging to various schools, such as Weber, Menger, Simmel, Spencer, Mises, Hayek, Popper, Watkins, Merton, Crozier and Boudon.

As understood by this second variant of methodological individualism, the individualism-holism debate is, contrary to what is often supposed today, unrelated to the opposition between reductionism and anti-reductionism. Rather, it is a conflict between a non-atomistic theory of human autonomy—strictly linked to an invisible hand model of explanation and a systemic conception of the social world—and a theory of socio-cultural heteronomy (see Boudon 2013, p. 25; Di Iorio 2015, p. 75 ff.). By 'holism', the non-reductionist variant of methodological individualism means a secular version of what Popper ([1945]1966a, p. 17) called the "theistic" interpretations of history, i.e. a view that conceives

history and social order as being caused by superhuman hidden powers and individuals as unconscious instruments of those powers. Understood in these terms, holism is the idea, rooted in Hegel's and Comte's philosophies of history and developed by various sociological and philosophical schools, that what matters and must be seen as the proper object of investigation in social sciences are mechanisms of unconscious social determination that make individuals remote-controlled and mold the society as an organized structure (Antiseri and Pellicani 1995; Antiseri 2007; Boudon 2013; Cubeddu 1993; Dawe 1970; Di Nuoscio 2016; Watkins 1957). By contrast, the non-reductionist variant of methodological individualism argues that individuals are self-determined beings and that social order, and social phenomena more generally, must be explained as largely unintentional results of human actions—actions explainable on taking into account the meanings that individuals attach to them, i.e. using an interpretative approach (*Verstehen*). According to this view, the fact that the ultimate causes of social phenomena must be sought within individuals rather than outside them does not mean that social conditioning does not exist, but only that, since human actions result from interpretative skills, this conditioning must be explained by assuming that the influence of the social environment is never mechanical, but always mediated by these skills (see Bronner 2007, pp. 166-167; Boudon and Bourricaud 1990, p. 13 ff.; Di Iorio 2015, pp. 98-115).

Many non-reductionist individualists (e.g. Mises [1949] 1998 42-45; Hayek 1952, p. 54; Popper 1966a, pp. 26 ff., 204 ff.) have stressed that the opposition between holism and individualism regarding the explanation of action and the ultimate causes of social phenomena must be seen as strictly related to a conflict over the ontology of collective nouns. According to these authors, methodological individualism interprets collective nouns that refer to social entities (e.g. the EU single market, the American Democratic Party, the British Army, the Catholic Church, and so on) in nominalist terms. This means that, although collective nouns cannot be semantically reduced to strictly individual properties, they do not refer to independent substances, i.e. to *sui generis* entities that exist independently of individuals like, for example, a stone or a tree. Collective nouns refer rather to individuals and the systemic and irreducible proprieties that emerge from their existence, their beliefs, their intentions and their interactions (See Dawe 1970; Di Iorio 2015; Di Nuoscio 2016; Nadeau 2003; Petitot 2012; Rainone 1990; Tuomela 1989; Zahale 2015). By contrast, the holist ontology as understood and criticized by non-reductionist individual-

ists is a form of Platonic realism. It assumes that, since collective nouns refer to Platonic supra-individual substances (like the 'structures' as understood by the French structuralists), individuals and their actions are derivatives of these substances, which means that they are unimportant from an ontological and explanatory standpoint. Framed in these terms, the ontological opposition between nominalism and realism is strictly related to the methodological opposition between individualist autonomy and holistic heteronomy. If collective nouns are conceived in nominalist terms, then the object of social sciences is represented by individuals (and emergent properties that concern a set of individuals), and the causes of actions must be sought within individuals, i.e. in their views and beliefs. On the contrary, if collective nouns are conceived in realist terms, the object of social sciences is represented by supra-individual Platonic substances, and the ultimate causes of actions must be sought outside individuals (Antiseri and Pellicani 1995; Pribam 2008, p. 120).

IDEALIST REDUCTIONISM AND SEMANTIC REDUCTIONISM

The holistic perspective criticized by methodological individualism, which was very influential until few decades ago, is no longer regarded as very appealing, and it is largely rejected today. However, methodological individualism is less popular than ever precisely because the entire individualist tradition is confused with atomism and reductionism. Most of the contemporary critics of methodological individualism reject holistic heteronomy, but they assume that holism was partly correct in that it was, unlike methodological individualism, an anti-reductionist and systemic theory of the social world (e.g. Bunge 1996; Kincaid 1986, 1996, 2014; Little 2014; Pettit 1993; Sawyer 2002, 2003; Udehn 2001). As a consequence, they defend a middle ground between holism and individualism, i.e. a 'synthesis' of these two paradigms merging an anti-reductionist approach, understood as a typical feature of holism rejected by methodological individualism, and a theory of human autonomy. This synthesis is sometimes called "structural individualism" (Udehn 2001, p. 318).

The widespread tendency to reject traditional individualism in the name of a new kind of structural (and anti-reductionist) individualism seems to be based on a mistaken and oversimplified interpretation of the former approach. This is because, as stressed by Demeulenaere (2011, p. 11), methodological individualists, or at least a

great number of them, “have always defended the idea that individuals are, let us say, ‘embedded’ in social situations that can be called ‘social structures’, and are in no respect isolated atoms moving in a social vacuum”. The notion of “structural individualism ... is ... inherent to...methodological individualism from the very beginning, as opposed to some versions of economic atomism” (ibid.). Within non-reductionist individualism, institutions and rules clearly have “effects upon individual action” (ibid.) even though they “have no direct ‘energy’ of their own” (ibid.; see also Demeulenaere 2012, pp. 25-26).

The accusation of ‘reductionism’ levelled against the entire individualist tradition, so widespread today, is expressed in two variants. The first interprets methodological individualism in terms of *idealist reductionism*; the second in terms of *semantic reductionism* (see Di Iorio 2015, pp. 103 ff; 2016). According to the interpretation of methodological individualism in terms of idealist reductionism (e.g. Archer 1995; Bhaskar 1979; Lawson 1997; Udehn 2001), this approach is mistaken because it denies the objective existence of the social structure and the constraints imposed by this structure on agents. Methodological individualism is interpreted in these terms because of its contention that social phenomena must be explained through the understanding of the meaning that the individuals attach to their actions, i.e. through a *Verstehen* approach. This approach is regarded as committed to the idea that the social system and social constraints must be reduced to purely subjective mental constructs. It is argued that methodological individualism is mistaken because this system and these constraints exist independently of the agent’s opinion about what he or she is free or not free to do, i.e. of his/her subjective standpoint. In other words, methodological individualism is seen as an anti-realist theory of the social world that interprets this world as a pure mental creation and denies that an objective social structure, characterized by a set of rules, sanctions and social positions, really exists outside the agent’s mind and entails his or her voluntarist powers being bounded. Methodological individualism is equated to the contention that neither the social world nor social conditioning can be regarded in terms of objective reality and effective constraints (for more details on this point see King 2004; Di Iorio 2016).

This criticism of methodological individualism does not seem to be fair. This is because this approach, or at least its non-reductionist variant, acknowledges that, from a sociological standpoint, personal and purely subjective beliefs “are more or less irrelevant” because they “are not the basis of social life” (King 2004, 190).¹

Methodological individualism explains the social world and the constraints that this world imposes on agents in terms of “collective beliefs” and of unintended consequences related to these “collective beliefs” (Boudon 1971; see Di Iorio 2015, p. 104). In other words, in analyzing the foundations of the social life and social conditioning, methodological individualism does not apply its interpretative approach (*Verstehen*) to purely personal and subjective opinions. Instead, it applies this approach to an “intersubjective” world (Schütz 1967, p. 218), i.e. to largely shared meanings, and it focuses on the real and concrete consequences of these shared meanings—consequences that can sometimes entail very brutal objective constraints on agents. As Hayek (1952, p. 34) pointed out, social systems must be seen as “the implications of many people holding certain views”. From the standpoint of methodological individualism, understanding the typical meanings that agents attach to their actions is the first step in explaining “the unintended or undesigned” nature of social structures and social constraints (1952, p. 25). From this it follows that methodological individualism cannot be equated to an anti-realist or idealist theory of structural constraints assuming that these constraints are mere subjective creations of a single human mind and that the agent’s voluntarist powers are unbounded. According to methodological individualism, since the social world cannot be reduced to a purely personal idea about what the social world is, this world cannot be changed voluntarily by a single will. Instead, the social world and the constraints that it imposes on agents can be altered only if the common view shared by many people changes (see King 2014; Di Iorio 2016).

The second variant of the interpretation of methodological individualism as reductionist is couched in terms of semantic reductionism. According to this variant, the claim by methodological individualists that social phenomena must be explained in terms of individuals means that this approach is supportive of a principle of semantic reduction of social properties to individual ones (see Rainone 1990, pp. 169 ff.; Petroni 1991, p. 16; Zahale and Collin 2014, pp. 2-10; Di Iorio 2016, 2015). This interpretation of methodological individualism, which developed within analytic philosophy, has been defended by authors such as Mandelbaum (1955), Lukes (1973), Ruben (1985), Kincaid (1986, 1990), Little (1990), Sawyer (2002, 2003) and Elder-Vass (2014). Conceived in terms of semantic reductionism, methodological individualism is criticized on the grounds that: (i) social phenomena cannot be analyzed without referring to concepts and laws that are semantically irreducible

to strictly individual properties; and (ii) that the existence of semantically irreducible factors and laws that causally influence mind and action cannot be denied. This interpretation of methodological individualism in terms of semantic reductionism seems implausible: (i) because many eminent advocates of methodological individualism, namely the representatives of what I have called above “the non-reductionist variant” of this approach, explicitly criticized this kind of reductionism and (ii) because the history of methodological individualism provides countless examples of models of explanation, related to the concepts of “system” and “unintended consequences of human actions”, inconsistent with semantic reductionism (see Boettke and Candela 2015; Di Iorio 2016, p. 105)

As clarified by both Boudon (1971, pp. 1-4) and Popper (1957, p. 82), from the standpoint of (non-reductionist) methodological individualism, the impossibility of semantically reducing social properties to strictly individual ones is trivially true. These two thinkers agreed that examples of social explanations that do not refer to semantically irreducible social properties cannot be found, and that the analysis of social phenomena in terms of irreducible properties is simply necessary and cannot be avoided. Developing a criticism of atomism and reductionism, Hayek (1967, p. 70), followed a similar line of reasoning. He argued that a society “is more than the mere sum of its parts” because it is a system, characterized by emergent properties, which presupposes that its constitutive elements are “related to each other in a particular manner” (ibid.; see Lewis 2011; 2014). Long before Hayek, Carl Menger, a major influence on him, had pointed out that, according to methodological individualism, the individual’s intentions and actions must be regarded as parts of an irreducible structure (see Antiseri 2007, p. 141 ff; Campagnolo 2013). For Menger ([1883]1985, 142), “social structures ... in respect to their parts are higher units”. In addition, they are endowed with “functions” that “are vital expressions of these structures in their totality” (p. 139). According to Menger (p. 147), society is a system because each part of it—each individual or each social subsystem (like a family or a firm)—“serves the normal function of the whole, conditions and influences it, and in turn is conditioned and influenced by it in its normal nature and its normal function”.

One of the reasons why the interpretation of methodological individualism in terms of semantic reductionism must be rejected is the strong connection between this approach and the concept of unintended consequences (see Boettke and Candela 2015; Boudon 2013; Bouvier 2011; Di

Iorio 2016, p. 106; Dupuy 2004; Petitot 2012). Explanations in terms of unintended consequences are inconsistent with semantic reductionism because they refer to emergent global properties that are irreducible to purely psychological and individual properties and laws. Explanations of this kind are irreducible to the agents’ mental and behavioral properties. Hayek’s analysis of the market in terms of a self-organizing system is an example of an irreducible individualist explanation based on the concept of unintended consequences (see Hayek 1948, pp. 77 ff; 1952; Bouvier 2011). Moreover, it shows how methodological individualism, as understood by the variant defended by Hayek, admits the existence of social emergent properties that causally influence action and restrict human freedom. Consider Hayek’s prices theory, which is central to his theory of the market’s self-organization. Like Mises, Hayek argues that market prices play a crucial role in market coordination (Hayek 1948, p. 85 ff; Mises [1922]1981). Prices unintentionally emerge from the aggregation of different individual evaluations and distributed items of information. Because of their unintentional nature, they are semantically irreducible. According to Hayek (and Mises), the coordination power of prices depends on the fact that they affect and limit the freedom of choice of agents, who need to adapt their decisions to price variations. Hayek stresses that prices are unintentionally created by human choices and that they in turn affect those choices, i.e. that the whole economic system causally influence its parts and vice versa (see Di Iorio 2016).

The interpretation of methodological individualism in terms of semantic reductionism stems from a misunderstanding of the individualist contention that social phenomena must be explained *in terms of individuals* (see Jarvie 1972, p. 157; Di Iorio 2015, pp. 107-108; 2016). This contention is confused with the idea that social phenomena must be semantically reduced to strictly individual properties and laws. However, by “explanations in terms of individuals”, the non-reductionist variant of methodological individualism does not mean that social phenomena must be explained through such a reduction, but something completely different. It means that social sciences must reject the holistic substantialist ontology of collective nouns and the explanatory models of history and society in terms of heteronomy strictly related to this ontology. The non-reductionist variant of methodological individualism assumes that individuals are the ultimate engine of history and social dynamics, and it interprets the social system and its semantically irreducible properties in anti-substantialist terms, i.e. in terms of unintended consequences produced by individuals, their beliefs,

actions and interactions (for more details on this point, see Di Iorio 2016, pp. 105-111; Di Nuoscio 2016; Manzo 2014, p. 21; McGinley 2012; Rainone 2002; Tuomela 1990, p. 34; Watkins 1957).

COMPLEX METHODOLOGICAL INDIVIDUALISM

This special issue of COSMOS + TAXIS is devoted to the non-reductionist variant of methodological individualism and analyses its nature and heuristic power from both an historical and methodological standpoint. It opposes the dominant assumption that social scientists need to get rid of the individualist tradition and develop alternative approaches because of the devastating arguments provided against reductionism by philosophy and systems theory. A basic assumption is that the tendency to equate methodological individualism and reductionism is both historically and logically untenable and that, as a consequence, arguments against the latter do not undermine the former.

Many articles focus on a specific subvariant of non-reductionist individualism that the French philosopher Jean-Pierre Dupuy (1992; 2004) called “complex methodological individualism”. This subvariant, unlike other non-reductionist individualist approaches such as interpretative sociology (e.g. Weber, Aron, Boudon) and the individualist social philosophy defended by Popper and his pupils, merges the concept of methodological individualism with that of self-organizing complex system (See also Dupuy and Dumouchel 1983; Petitot 2009; 2012).² Its privileged—but not unique—object of study is the market society and its cultural and evolutionary presuppositions. As stressed by Hayek (1973, pp. xviii- xix), who has been the most eminent advocate of this complex methodological individualism, the origins of this approach must be traced back to the Scottish Enlightenment, i.e. to the work of authors such as Bernard De Mandeville, Adam Smith, Adam Ferguson, and David Hume. These thinkers interpreted market society in terms of spontaneous order and the invisible hand, anticipating the explanatory method in terms of complex self-organizing system used by the complexity sciences and systems theory. Apart from Hayek and the thinkers of the Scottish Enlightenment, other important theorists of this complex methodological individualism are Lord Acton, Herbert Spencer, and the other members of the Austrian school of economics, namely Carl Menger and Ludwig von Mises. According to Hayek, even if the representatives of the tradition of the spontaneous order in philosophy and economics did not use the complexity sciences’ terminology

and the term “complex self-organizing system”, which has been invented only in relatively recent times, they basically took the same approach as these sciences and must be considered their precursors. Hayek stressed the heuristic utility of applying this new terminology to the traditional individualist analysis of market society in invisible-hand terms because of its greater precision, clarity and accuracy.

According to complex methodological individualism, market society must be interpreted as a complex self-organizing system because it is a very open system (in the sense that its initial conditions change in a continuous and unpredictable manner) comprising an extremely high number of operatively autonomous components (agents), whose activities are dynamically coordinated through a spontaneous process. There is no central direction within a market society. The cooperation and coordination of agents depends on their compliance with some general and abstract rules that govern their direct interactions and allow the formation of market prices (see Birner 1994, p. 2 ff.; Hayek 1973, pp. 34 ff.; Marsh and Onof 2008; Nemo 1988; Petitot 2012). Within a market, prices work as a cybernetic mechanism in the sense that they reflect information about countless local temporary circumstances and ensure the use of a distributed knowledge so as to allow the agents’ coordination (see Hayek 1948, pp. 77 ff.). The emergent global behavior of the system, which develops unintentionally, is characterized by a dynamic and constant adaptation of the local to the global, and the global to the local. In other words, it is based on a recursive loop between individuals and the prices unintentionally produced by human decisions which in turn influence those decisions (see Boettke and Candela 2015; Dupuy 2004). This global behavior is predictable only in terms of very general patterns, but it is unpredictable in detail because of the complexity of the system, i.e. because of its extreme openness. This complexity entails the constant and unpredictable change of the initial conditions, and it is related to the operative autonomy of the high number of agents who compose the system, as well as to the constant variation of their circumstantial knowledge. A strict application of the *ceteris paribus* clause, which is required for detailed previsions, is possible only for a system that can be assumed to be closed, while it is impossible for a complex self-organizing system (see Di Iorio 2015, pp. 42-43; Dupuy 1990; Petitot 2012; Di Nuoscio 2016; Caldwell 2007, p. 363; 2009, pp. 13 ff.).³ Since a market is based on spontaneous cooperation for adaptive and evolutionary reasons, i.e. because its complexity cannot be mastered, a planned economy cannot match its performances and is bound to

fail. By means of self-organization, a market system uses a distributed knowledge that cannot be centralized.

I would like to conclude this short introduction with a terminological remark. The term ‘complex methodological individualism’, which designates a specific subvariant of non-reductionist methodological individualism, is useful to distinguish this subvariant from both reductionist individualism and other subvariants of non-reductionist methodological individualism. Its utility partly depends on the widespread confusions about the meaning of the generic term ‘methodological individualism’, i.e. on the tendency to use the expression as a synonym of ‘reductionism’. Given these confusions and the existence of different variants and subvariants of methodological individualism, referring to the methodological assumptions of the tradition of the spontaneous order using the generic term ‘methodological individualism’ seems, although correct, less informative and accurate than using the term ‘complex methodological individualism’.⁴

NOTES

- 1 King (2004), who defended the interpretative approach developed by Weber and other eminent representatives of the *Verstehen* tradition from the objections developed by Bhaskar and other critical realists, does not call the *Verstehen* approach “methodological individualism” as I do. However, the essence of his view on the philosophical and methodological assumptions of the social sciences does not differ from mine. It seems to me that he is supportive of an approach consistent with what I called above “the non-reductionist variant of methodological individualism”.
- 2 To be noted is that Weber (pp. 63 ff.) used the concept of complexity to criticize the planned economy in the first book of *Economy and Society*. Moreover, Popper (1957, pp. 36-40) referred to this concept as well, stressing its importance in social sciences, although he did not focus on it in detail. As a consequence, the distinction between complex methodological individualism and other variants of non-reductionist individualism must not be interpreted as clear-cut.
- 3 Although Hayek was one of the originators of complexity theory, he did not provide a good definition of “complexity” (see Di Iorio 2015; Dupuy 1990; Petitot 2002; Di Nuoscio 2006; Caldwell 2009). Hayek (1967) argued that “complexity” results from the fact that the behavior of certain systems is highly unpredictable (except for some general patterns) because it is determined by a very high number of variables. However, even systems made up of a very large number of variables can be perfectly predictable if they are closed. Hayek’s definition of complexity neglects to take into account a point stressed by Hayek himself in his works on market and mind, i.e. the constant and unpredictable change of the initial conditions which affect complex systems: these systems are extremely open systems (Hayek 1952b, pp. 185 ff.; 1967, pp. 55 ff.; see also Nadeau 1997, pp. 67 ff.; Caldwell 2004, p. 363; Di Nuoscio 2006, pp. 46-48; Marsh 2010, pp. 140-141).
- 4 I would like to thank both David Anderson and Leslie Marsh for inviting me to guest edit this special issue of COSMOS + TAXIS, as well as all the contributors for their excellent work and cooperation. I also wish to express my gratitude to all the reviewers. In addition, I thank Gianluca Cavallo, who gave permission for his painting “Liride” to be reproduced on the cover of this issue.

REFERENCES

- Antiseri, D. and Pellicani, L. (1995). *L'individualismo metodologico. Una polemica sul mestiere dello scienziato sociale*. Milan: Franco Angeli.
- Antiseri, D. (2007). *Popper's Vienna*. Aurora, CO: The Davies Group Publishers.
- Archer, M. (1995). *Realist Social Theory: The Morphogenetic Approach*. Cambridge: Cambridge University Press.
- Bhaskar, R. (1979). *The Possibility of Naturalism*. Sussex: Harvester.
- Birner, J. (1992). Hayek's Grand Research Program. In: *Birner J. and Van Zipp R. (Eds.), Hayek, Co-ordination and Evolution: His Legacy in Philosophy, Politics, Economics and the History of Ideas*. London and New York: Routledge.
- Boettke, P. (2012). *Living Economics. Yesterday, Today, and Tomorrow*. Oakland, CA: The Independent Institute.
- Boettke, P. and Candela, R. A. (2015). What Is Old Should Be New Again: Methodological Individualism, Institutional Analysis and Spontaneous Order. *Sociologia* 2: 5-14
- Boudon, R. (1971). *Uses of Structuralism*. London: Heinemann.
- Boudon, R., and Bourricaud, F. (1990). *A Critical Dictionary of Sociology*. Chicago: University of Chicago Press.
- Boudon, R. (2013). *Sociology as Science: An Intellectual Autobiography*. Oxford: The Bardwell Press.
- Bouvier, A. (2011). Individualism, collective agency and the "micro-macro relation." In: *The Sage Handbook of the Philosophy of Social Sciences*, J. C. Jarvie, and J. Zamora Bonilla (Eds.), London: Sage Publications.
- Bronner, G. (2007). *L'Empire de l'erreur. Eléments de sociologie cognitive*. Paris: Puf.
- Bunge, M. (1996). *Finding philosophy in social science*. New Haven and London: Yale University Press.
- Caldwell, B. (2007). *Hayek's challenge: An intellectual biography of F. A. Hayek*. Chicago: University of Chicago Press.
- Caldwell, B. (2009). Some Comments on Lawson's Reorienting Economics: Same Facts, Different Conclusions. In: Edward Fullbrook (Ed.) *Ontology and Economics: Tony Lawson and His Critics*. London and New York: Routledge.
- Campagnolo, G. (2013). *Criticisms of Classical Political Economy: Menger, Austrian Economics and the German Historical School*. London/ New York: Routledge.
- Cubeddu, R. (1993). *The Philosophy of the Austrian School*. London and New York: Routledge.
- Dawe, A. (1970). The two sociologies. *British Journal of Sociology* 21(June): 207-218.
- Demeulenaere, P. (ed.). (2011). *Analytical Sociology and Social Mechanisms*. Cambridge: Cambridge University Press.
- Di Iorio, F. (2015). *Cognitive Autonomy and Methodological Individualism: The Interpretative Foundations of Social Life*. Berlin and New York: Springer.
- Di Iorio, F. (2016). World 3 and Methodological Individualism in Popper's Thought?, *Philosophy of the Social Sciences*. DOI: 10.1177/0048393116642992, 2016, pp. 1-23
- Di Nuoscio, E. (2016). *Philosophy of Social Sciences*. Oxford: The Bardwell Press.
- Dupuy, J.-P. (1990). *Ordres et désordres. Enquête sur un nouveau paradigme*. Paris: Seuil.
- Dupuy, J.-P. (1992) *Le sacrifice et l'envie*. Paris: Calmann-Lévy.
- Dupuy, J.-P. and Dumouchel, P. (Eds.). (1983). *L'Auto-Organisation de la Physique au Politique*. Paris: Seuil.
- Dupuy, J.-P. (2004). Vers l'unité des sciences sociales autour de l'individualisme méthodologique complexe. *Revue du MAUSS* 24(2): 310-328.
- Elder-Vass, D. (2014). Social entities and the basis of their powers. In: *Rethinking the Individualism-Holism debate. Essays in the philosophy of social science*, eds. J. Zahle and F. Collin. Berlin and New York: Springer.
- Hayek, F. A. (1948). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, F. A. (1952). *The Counter-Revolution of Science: Studies on the Abuse of Reason*. Indianapolis: Liberty Press.
- Hayek, F. A. (1967). *Studies in Philosophy, Politics and Economics*. Chicago: University of Chicago Press.
- Hayek, F. A. (1973). *Law, Legislation and Liberty, Vol. 1: Rules and Order*. Chicago: University of Chicago Press.
- Jarvie, I. C. (1972). *Concepts and Society*. London: Routledge & Kegan Paul.
- Jarvie, I. C. (2001). *The republic of science: The emergence of Popper's social view of science 1935-1945*. Amsterdam and Atlanta: Rodopi.
- King, A. (2004). *The structure of social theory*. London: Routledge.
- Kincaid, H. (1986). Reduction, explanation, and individualism. *Philosophy of Science* 53(4) (December): 492-513.
- Kincaid, H. (1990). Eliminativism and methodological individualism. *Philosophy of Science* 57(1)(March): 141-148.
- Kincaid, H. (2014).
- Laurent, A. (1994). *L'individualisme méthodologique*, Paris: Puf.
- Lawson, T. (1997). *Economics and Reality*. London and New York: Routledge.
- Lewis, P. (2012). *Emergent Properties in the Work of Friedrich Hayek*. *Journal of Economic Behavior & Organization* 82: 268-378.
- Lewis, P. (2015). *Notions of Order and Process in Hayek: the Significance of Emergence*. *Cambridge Journal of Economics*, 39: 1167-1190.
- Little, D. (1990). *Varieties of social explanation: An introduction to the philosophy of social science*. Boulder: Westview Press.
- Lukes, S. (1973). *Individualism*. New York: Harper & Row.
- Mandelbaum, M. (1955). Societal facts. *British Journal of Sociology* 6(4) December: 305-317.
- Manzo, G. (2014). *Analytical sociology: Actions and networks*. Chichester: Wiley.
- Marsh, L. and Onof, C. (2008). Stigmergic epistemology, stigmergic cognition. *Cognitive Systems Research* 9: 136-149.
- Marsh, L. (2010). Hayek: Cognitive scientist avant la lettre. *Advances in Austrian Economics* 13:115-155.
- McGinley, W. (2012). Reduction in Sociology. *Philosophy of the Social Sciences* 42(3) September: 370-398.
- Menger, C. ([1871] 2004). *Principles of Economics*. Auburn: The Ludwig von Mises Institute.
- Menger, C. ([1883]1985). *Investigations into the method of the social sciences with special reference to economics*. New York and London: New York University Press.
- Mises, L. ([1922] 1981). *Socialism: An economic and sociological analysis*. New York: Liberty Fund.
- Mises, L. ([1949] 1998). *Human action: A treatise on economics*. Auburn: The Ludwig von Mises Institute.
- Nadeau, R. (1997). Hayek and the complex affair of the mind. Sixty-seventh Annual Conference of the Southern Economic Association, Atlanta, 21-23 November.

- Nadeau, R. (2003). Cultural evolution true and false: A debunking of Hayek's critics. *Proceedings of 7th ESHET Conference*, Paris, 30 January-1 February.
- Nemo, P. (1988). *La société de droit selon Hayek*. Paris: Puf.
- Petitot, J. (2009). *Per un nuovo Illuminismo*. Milan: Bompiani.
- Petitot, J. (2012). "Individualisme méthodologique et évolution culturelle". In *Un austriaco in Italia. Studi in onore di Dario Antiseri*, eds. E. De Mucci and K. R. Leube. Soveria Mannelli: Rubbettino.
- Petroni, A. M. (1991). L'individualisme méthodologique. *Journal des Economistes et des Études Humaines*. 2(1): pages
- Popper, K. R. (1957). *The Poverty of Historicism*. Boston: Beacon Press.
- Popper, K. R. ([1945a] 1966a). *The Open Society and Its Enemies*, Vol. 1: The Spell of Plato. Princeton: Princeton University Press.
- Popper, K. R. ([1945b] 1966b). *The Open Society and Its Enemies*, Vol. 2: Hegel and Marx. Princeton: Princeton University Press.
- Pribram, K. (2008). La genesi della filosofia sociale individualistica. In: *L'individualismo nelle scienze sociali*, ed. E. Grillo. Rubbettino: Soveria Mannelli.
- Rainone, A. (1990). *Filosofia analitica e scienze storico-sociali*. Rome: ETS.
- Ruben, D-H. (1985). *The metaphysics of the social world*. London: Routledge & Kegan Paul.
- Schütz, A. (1967). *The phenomenology of the social world*. Evanston: Northwestern University Press.
- Tuomela, R. (1989). Ruben and the metaphysics of the social world. *The British Journal for the Philosophy of Science*. 40(2): 261-273.
- Tuomela, R. (1990). Methodological individualism and explanation. *Philosophy of Science* 57(1): 133-140.
- Udehn, L. (2001). *Methodological individualism: Background, history and meaning*. London and New York: Routledge.
- Sawyer, R. K. (2002). Nonreductive individualism. Part I—Supervenience and wild disjunction. *Philosophy of the Social Sciences* 32(4): 537-559.
- Sawyer, R. K. (2003). Nonreductive individualism. Part II—Social causation. *Philosophy of the Social Sciences* 33(2): 203-224.
- Watkins, J. W. N. (1952b). The principle of methodological individualism. *The British Journal for the Philosophy of Science* 3(10): 186-189.
- Watkins, J. W. N. (1957). Historical explanation in the social sciences. *The British Journal for the Philosophy of Science* 8(30): 104-117.
- Weber, M. (1978). *Economy and Society: An Outline of Interpretive Sociology*, Volume I. Los Angeles: University of California Press.
- Zahle, J. and Collin, F. (eds.). (2014). *Rethinking the individualism-Holism debate. Essays in the philosophy of science*. Berlin and New York: Springer.
- Zahle, J. (2014). *Holism, emergence, and the crucial distinction*. In: Zahle and F. Collin (2014).