

Reason, scientism, and methodology: Hayek's adherence to complexity through the development of his methodological criticism in the Abuse of Reason Project

Razão, cientificismo e metodologia: a adesão de Hayek à complexidade através do desenvolvimento de sua crítica metodológica no Abuse of Reason Project

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RESUMO: O artigo apresenta uma narrativa sobre a emergência do conceito de complexidade na obra de Friedrich A. Hayek. É mostrado que a complexidade emerge das preocupações metodológicas de Hayek e, especificamente, de seus textos que compõem as duas primeiras partes do Abuse of Reason Project. Nominalmente, a) 'Individualism: True and False', de 1946; b) 'Scientism and the Study of Society', publicado entre 1942 e 1944; e c) 'The Counter Revolution of Science', de 1941. No presente artigo, é argumentado que o conceito de complexidade emerge gradualmente e organicamente, e está integrado ao programa de pesquisa hayekiano a partir da década de 1940.

PALAVRAS-CHAVE: Friedrich A. Hayek; complexidade; abuso da razão; cientificismo; metodologia.

ABSTRACT: This article presents a narrative on the emergence of the concept of complexity in Friedrich A. Hayek's work. We show that complexity emerges from Hayek's methodological concerns and, specifically, from his texts that compose the first two parts of the Abuse of Reason Project. Namely, a) 'Individualism: True and False', from 1946; b) 'Scientism and the Study of Society', published between 1942 and 1944; and c) 'The Counter Revolution of Science', from 1941. In this paper, we aim to expose that the concept of complexity emerges gradually and organically and is integrated with the Hayekian research program from the 1940s.

KEYWORDS: Friedrich A. Hayek; complexity; abuse of reason; scientism; methodology.

JEL Classification: B25; B31; B41.

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INTRODUCTION

Friedrich A. Hayek is one of the leading names associated with the belief that economists should treat their object of study from a perspective of complexity (Vaughn, 1999b; Barbieri, 2013; Mauerberg Junior, 2013). Hayek had already warned his professional peers about the existence of a methodological problem in the economics field even before the middle of the twentieth century, in 1940s. Hayek stated that economists envied the simple objective natural sciences, such as physics, resulting in attempts to import their methods without much concern about the particularities of each scientific realm. This was done even though the nature of the economics field is fundamentally different.

Hayek's set of works in philosophy, politics, and economics has been the subject of much research. Attempts to interpret and systematize his research program have occurred over the last few decades, such as in the books by, among others, Gerald P. O'Driscoll (1977), John Gray (1984), Gerald Steele (1993), Steve Fleetwood (1995), and Bruce Caldwell (2004a). With this in mind, this article aims to clarify how the development of Hayek's methodological concerns and positioning, in the early 1940s, ultimately culminated in his use of the complexity approach. Complexity in Hayek's economic, methodological, and social philosophical thought is associated with the dispersed, subjective, and tacit (i.e., fallible) knowledge possessed by human beings in the context of social phenomena. In particular, Hayek understood complexity as the degree within these limitations of knowledge make itself present in patterns, orders, and phenomena that are unintended consequences of many inter-dependent causes and human actions. The primary example of such complex phenomena is the social unintended coordination process of certain formal and informal institutions, mainly constituted by inherited traditions, conventions, and habits, which defines the modern division of labor of a complex industrial economy.

In 1937, Hayek published the essay 'Economics and Knowledge' (1937), which was inserted in the context of the debates about the socialist economic calculation that were happening at that time (Caldwell, 1988; Kirzner 1988; Vaughn 1999a, 1999b). Hayek's critique and position in relation to the economic calculation debate, in a sense, served as a catalysis for his *sui generis* approach, culminating in the formulation of the fundamental economic problem presented for the first time in an explicit fashion in that essay. From a theoretical economist concerned with industrial fluctuations to a mature social philosopher engaged in the notion of spontaneous order and cultural evolution, Hayek sought to develop a research program based on a question formulated explicitly for the first time in 'Economics and Knowledge' (1937). Hayek, for the first time, 'makes the claim that the coordination problem is the central problem, not for economics, but for all social science' (Caldwell, 1988, p. 514).

Therefore, in 1937 Hayek establishes his epistemological orientation more consciously, which will lead him to the logical necessity of the knowledge coordination problem. This change of thought will redirect his attention to broader issues

of a philosophical and interdisciplinary nature. Thus, with the problem of coordination in mind, it becomes necessary to study how (and if) each institutional arrangement is able to coordinate the plans and the knowledge of individuals. The focus begins to be on different processes of plans adjustment through different institutional structures. The question turns to be of which is the best institutional framework to create, transmit, and preserve the relevant knowledge for the coordination of individual plans and, thus, tendency to equilibrium. The analytical interest here is on the process of a tendency towards equilibrium, not the proprieties of a hypothetical final state of equilibrium *per se*. In order to establish and advance such investigation, it became necessary for Hayek to develop a broader and interdisciplinary approach, taking into account the institutional framework of each coordination system in analysis and the methodological mistakes that his opponents in the economic calculation debate had failed to see. Thus, Hayek approaches a broader research scope (see Boettke, 2002, pp. 344-5; Boettke *et al.*, 2010, p. 73; Paulani, 1996, p. 100).

This event described above became a mark in the development of Hayek's research agenda, since it brought to light, or at least explicitly exposed, the fundamental problem that economics as a science must address according to the Hayekian perspective, that is, the problem of knowledge. Hayek (1937) argued that the problem of knowledge is a consequence of the illegitimate transposition of the idea of individual equilibrium, defined in the realm of the pure logic of choice subject to the individual's subjective perceptions, to the notion of equilibrium for society. It was then observed that the necessary condition to social equilibrium is the coordination of an agent's subjective expectations of reality (incorporated in his action plan) with the other multiple individuals' subjective expectations (embodied in the different action plans) and with the objective external world. In order to postulate a tendency towards equilibrium, a given agent must know the subjective expectations of the other individuals and the objective reality. To do so, it is necessary to create a mechanism of acquisition, communication, and storage of knowledge in order to reconcile the subjective inter-individual plans with each other and with the objective circumstances of real world.

Neoclassical theory solves the problem derived from this transposition by assuming that perfect knowledge is given equally to all, thus hiding the epistemic problem that economics and the social sciences should explain. In Hayek's view, this epistemic problem discussed above introduces the empirical nature into economic theory, which would enable one to say something about the real world (a tendency or not towards equilibrium). That is, to say something about the conditions and the process by which individuals acquire knowledge and coordinate their action plans.

Associated with the acceptance of the coordination problem is the epistemic postulate of fallible knowledge, which understands knowledge as a temporary state of things and beliefs that may or may not be supported by the objective reality of the external world. Such subjective beliefs are subject to endless corroborations with other beliefs and with reality at a given time. These social validation pro-

cesses are characterized as a learning dynamics that constantly urge to the review of the various individual action plans. It is a ceaseless flux of expectations and decisions that have failed and need to be modified in order to adjust each action plan to another, 'as all those other people will change their decisions as they gain experience about the external facts and other people's action, there is no reason why these processes of successive changes should ever come to an end' (Hayek, 1937, p. 49).

Error is the most regular and common thing of social life. Most knowledge, especially of practical nature, will somehow fail and will have to be revised, modified, or abandoned. The point is how to develop and increase error correction via an institutional learning mechanism in which the discovery, use, and communication of dispersed, subjective, and tacit knowledge can be used in the best possible way and in order to coordinate the actions of different individuals. Since knowledge is dispersed, and each person possesses only a fraction of subjective knowledge of time and place, knowledge also often tacit 'of the kind which by its nature cannot enter into statistics' (Hayek, 1945, p. 83), the problem of knowledge is an inexorable imposition. In other words, '[t]he epistemological problem is a permanent problem' (Boettke *et al.*, 2010, p. 83).

According to Hayek (1945, p. 89), the failure of the economic profession to perceive such a problem is 'clearly due to purely intellectual, and more particularly methodological, differences.' Hayek mentions that the case of a theorist of the stature of Joseph A. Schumpeter, who has fallen into the ambiguity trap of the term 'datum,' does not reveal just a simple mistake. This case suggests a profound methodological disruption in the current approach. Thus, 'there is something fundamentally wrong with an approach which habitually disregards an essential part of the phenomena with which we have to deal: the unavoidable imperfection of man's knowledge and the consequent need for a process by which knowledge is constantly communicated and acquired' (Hayek, 1945, p. 91).

If the profession in general was systematically 'numbed' and was mistakenly led to certain conclusions by the indiscriminate use of a tool used to its own end, that is, the construct of equilibrium as a final state of rest, what led to such a degree of disconnection between economic theory and its practitioners in relation to the real issues to be answered? Where did economic theory and its students go wrong? The answer, in Hayek's opinion, is methodological. The traditional methodological view prevented any kind of appreciation for the intrinsic ignorant condition of human knowledge and excluded from its scope the fact that knowledge is dispersed, subjective, and tacit — a view that is myopic to the problem of coordination.

Within a much broader tradition in the history of ideas, the attraction of the *intelligentsia* — of all ideological spectrum — to the idea of central planning was unmistakable. With a methodological failure diagnosis, which not only falls on the mainstream of the profession in particular but also on a genealogy in the history of ideas, Hayek started an investigation on the rise, abuse, and decline of reason — named the Abuse of Reason Project (see, e.g., Caldwell, 1997, pp. 1866-73; Hayek, 1983, pp. 132-3, 227-9, 276-80, 421-3; 1944, pp. 1-31; 2010, pp. 1-45).

As Caldwell (2004a, chapter 11) shows, Hayek never executed his original conception of the Abuse of Reason Project, which was a grand reconstruction of the history of ideas and methodology.¹ The initial structure of the project is divided into four parts: (i) the first should be a study of the eighteenth-century individualist theories — which in Hayek’s preliminary results became ‘Individualism: True and False’ (1946); (ii) the second was planned as an investigation of the intellectual sources of the hostility to such philosophy of individualism; (iii) the third should deal with how this hostility, the rise of reason, has historically developed in countries such as France, Germany, and the United States – (ii) and (iii) resulted in ‘The Counter-Revolution of Science’ (1941), ‘Scientism and the Study of Society’ (1942-44), and ‘Comte and Hegel’ (1951); and (iv) the fourth and final part was envisioned as a discussion of the abuse and fall of reason under authoritarian regimes, from which his most popular book, *The Road of Serfdom* (1944), was originated (Hayek, [1952] 1979, pp. 10-1; Caldwell, 2004a, pp. 240-1).

The present article brings a narrative of how the issue of complexity in Hayek emerges from his methodological concerns, more specifically from his texts that composes the first three parts of the Abuse of Reason Project.² It is argued that his complexity approach can be interpreted as emerging gradually and is organically integrated into the Hayekian research program developments from the early 1940s. The remainder of the article is structured as follows. The next section concerns the first part of the Abuse of Reason Project, i.e., the essay on ‘Individualism: True and False’ (Hayek, 1946). Then, the following section evaluates the second and third parts, collected in the book *The Counter-Revolution of Science* (Hayek, [1952] 1979). Finally, the final considerations conclude this essay.

REASON AND INDIVIDUALISM

In the first part of his great project, Hayek (1946) draws two distinct intellectual traditions, commonly labeled as ‘individualistic.’ The author claims that he

¹ According to Caldwell (2004a, ch. 11), the Abuse of Reason Project was not concluded in the way it was originally idealized. Hayek changed the initial project, turning it into two different, but interlinked, ‘research ventures’ (Caldwell, 2004a, p. 256). The first of these two ventures started with *The Road to Serfdom*, and would have walked to *The Constitution of Liberty* (1960) and the trilogy *Law, Legislation, and Liberty* (1973-9). The second would be characterized by Hayek’s physiological-psychology book *The Sensory Order*, ‘and a series of later essays, many of which were published in collections of Hayek’s work’ (Caldwell, 2004a, p. 256).

² With this in mind, we aim to complement efforts like the ones of Vaughn (1999b), who, despite mentioning *The Counter Revolution of Science*, focuses on the works of Hayek published during and after the 1950s, and of Oliva (2016), who presents how Hayek approaches complexity in his writings about knowledge and competition from 1930 to 1950 in an implicitly way, and explicitly afterwards. The difference is that we aim to study the first part of this narrative from texts explicitly associated by Caldwell (2004a, chapter 11) with the Abuse of Reason Project in the 1940s. We aim to present the texts in the order that was initially idealized in the Abuse of Reason Project and not in the order they were published.

is heir to what he calls true individualism, which is directly connected to Scottish Enlightenment, as opposed to a false individualism, which came from French and Continental Enlightenment. The latter is contaminated with the conception of reason as the creator of the social order subdued only to a deliberate act of will embedded in its construction. Hayek uses the term ‘individualism’ as the opposing term to ‘socialism.’ It is for this justification that he considers the false individualism the tradition that, although apparently associated with an opposition to socialism, ends up ‘as a source of modern socialism as important as the collectivist theories’ (Hayek, 1946, p. 4).

According to Hayek, the tradition of true individualism was originated and founded in John Locke’s work. Then, it was later developed by Bernard Mandeville and David Hume, reaching its mature stature with Josiah Tucker, Adam Ferguson, Adam Smith, and Edmund Burke in the eighteenth century. In the nineteenth century, the great names of this tradition were Lord Acton and Alexis de Tocqueville, both who ‘have more successfully developed what was best in the political philosophy of the Scottish philosophers, Burke, and the English Whigs than any other writers’ (ibid.). On the other hand, the tradition of false individualism refers primarily to authors embedded in Cartesian rationalism, such as the Encyclopedists, Physiocrats, and Jean-Jacques Rousseau. The difference between the traditions of false and true individualism transcends the history of ideas and social philosophical thought.

What, then, defines the essence of true individualism? In the first place, it is a theory of society, an attempt to understand the social forces that govern our surroundings. Secondly, it is a theory that only in a second logical step attempts to derive ‘a set of political maxims,’ i.e., any conclusions of normative character. Individualism, according to Hayek, does not postulate the existence of isolated, atomized or amorphous individuals in their context and society. However, it understands that there is no other way to comprehend the social phenomenon without understanding the actions of individuals towards other individuals in order to achieve their own ends. These actions are guided by the subjective interpretations of the expected behavior from other individuals and external reality. This leads to one of the main differences between the two traditions. By analyzing the consequences of individual actions, one notices that the most important institutions upon which based Western civilization have emerged, developed, and functioned without any total central plan, design, or intent of a single mind.

The institutions that form this civilizing basis are in fact the result of a process of spontaneous interactions and collaborations among an infinity of individuals’ agents, which entails achievements and unintended consequences that each participant is not even consciously aware.

[C]ivilization was the accumulated hard-earned result of trial and error; [...] it was the sum of experience, in part handed from generation to generation as explicit knowledge, but to a larger extent embodied in tools and institutions which had proved themselves superior – institutions

which we might discover by analysis but which will also serve men's ends without men's understanding them. (Hayek, 1960, p. 60)

Hayek illustrates this point quoting Ferguson's famous statement that the social institutions in which founded modern civilization are 'the result of human action but not the result of human design.' Hayek believes that this is the great discovery of the Scottish Enlightenment and classical economics, the notion of a non-intended, non-designed, and complex social order defined as the consequences of many individuals' actions within the boundaries of certain rules of conduct. Such study of spontaneous orders 'has become the basis of our understanding not only of economic life but of most truly social phenomena' (Hayek, 1946, p. 8).

However, Hayek (1946, p. 8) argues that this difference in conception is only a consequence of a more profound and fundamental difference, which is greater in scope and scale.

It is between a view which in general rates rather low the place which reason plays in human affairs, which contends that man has achieved what he has in spite of the fact that he is only partly guided by reason, and that his individual reason is very limited and imperfect, and a view which assumes that Reason, with a capital R, is always fully and equally available to all humans and that everything which man achieves is the direct result of, and therefore subject to, the control of individual reason. One might even say that the former is a product of an acute consciousness of the limitations of the individual mind which induces an attitude of humility toward the impersonal and anonymous social processes by which individuals help to create things greater than they know, while the latter is the product of an exaggerated belief in the powers of individual reason and of a consequent contempt for anything which has not been consciously designed by it or is not fully intelligible to it.

Therefore, the primary difference lies in the role of human reason and knowledge. On the one hand, there is the notion of a perfect objective knowledge and a superhuman rational capacity that is available to each human being. It is a fictitious world in which any social order that has not been rationally established in a top-down manner is seen as unintelligible and inconceivable. On the other hand, there is the epistemological conception of fallibility of knowledge. The limitation of individual knowledge, which is restricted to the spatiotemporal core of the particular conditions of each individual, is thus emphasized. The individuals do not realize that the articulation of relevant knowledge generated by their own actions within innumerable institutional arrangements facilitates processes that are considered unimaginable by each of them. True individualists understand the limitations and fallibility of knowledge, which leads them to assume a posture of humility regarding the institutional processes of impersonal coordination from which the social order emerges.

Hayek faced the same methodological problem when addressing the concept of equilibrium. It is clear for Hayek that the confusion about the term data, the equilibrium notion, and the misunderstandings in the calculation debate came from the ideas of the false individualism. Its methodological assumptions supported the philosophical and meta-theoretical argument that favored central planning in the economic calculation debate. Hayek argues that one of the reasons economists got lost was the increased influence of Cartesian rationalism and Continental Enlightenment, which began with the classical economists of the nineteenth century – in particular, thinkers such as John Stuart Mill and Herbert Spencer. They were influenced by both false and true individualism, which caused confusion regarding the meanings of each philosophy. True individualism, Hayek goes on (1946, pp. 8-9), arises from a method ‘which regards man not as a highly rational and intelligent but as a very irrational and fallible being, whose individual errors are corrected only in the course of the social process, and which aims at making the best of a very imperfect material.’

The abyssal difference among these ideal types of individualism results in two decisive points. The first is that only true individualism is able to accept in its theoretical framework the appraisal and intelligibility of the process of spontaneous and complex interactions that results in the social order and its products. The second is that only true individualism is able to justify the belief that free individuals within an appropriate institutional framework will be able to undergo processes and achieve social outcomes much more effectively than any central planned order in toto. The key here is the appropriate institutional environment in which individuals make their decisions and act. This happens even if individuals are unable to anticipate or predict the results of their actions.

False individualism is apathetic to such an appreciation, its *raison d'être* implies that social processes and their outcomes are conditioned by subordination to human reason and design. The confluence of the social order and the aims of society would only be possible if the latter was molded by the control of individuals and their reason. For Hayek, this is impossible, since human knowledge and Reason, with a capital ‘R’, does not exist in a concentrated, accessible, or given form to any person. The process of rationality, with a lowercase ‘r’, is conceived in the very progressive mechanism of learning and correcting of errors that occur in the free interaction among individuals in a particular set of institutions.

True individualism does not assume the convergence of interests as an *a priori* hypothesis, a passive compatibility of human interests in *vacuo*. But stresses the importance of the institutional framework that create the knowledge necessary and embodied by individuals for the coordination and accordance of diffuse and contradictory interests. The problem lies in enabling an adequate institutional environment that guides men – by their own wills and actions – to comply with someone else’s intents and to favor these demands and wishes through an impersonal and unplanned coordination process. Given the limits of knowledge and reason, ‘the constitutional limitation of man’s knowledge and interests,’ the difficulty lies in

identifying and establishing the best institutional means of creating, transmitting, and storing knowledge that is relevant to the complex task of social coordination.

The chief concern of the great individualist writers was indeed to find a set of institutions by which man could be induced, by his own choice and from the motives which determined his ordinary conduct, to contribute as much as possible to the need of all others; and their discovery was that the system of private property did provide such inducements to a much greater extent than had yet been understood. They did not contend, however, that this system was incapable of further improvement and, still less, as another of the current distortions of their arguments will have it, that there existed a 'natural harmony of interests' irrespective of the positive institutions. (Hayek, 1946, pp. 12-3)

As a normative prescription, or main practical conclusion, true individualism extracts from the dispersed and fallible character of human individual knowledge – which is capable of covering only an infinitesimal part of the knowledge of society – the humility that is necessary to meet the demand for a strict limitation of all coercive power, which is legitimate only to areas essentially defined. Indeed, 'the fundamental attitude of true individualism is one of humility toward the processes by which mankind has achieved things which have not been designed or understood by any individual and are indeed greater than individual minds' (Hayek, 1946, p. 32).

SCIENTISM AND ABUSE OF REASON

In 'Scientism and the Study of Society' (1942-44, p. 24), Hayek addresses the indiscriminate and illegitimate application of methods from the natural sciences in the social sciences, which he calls scientism.

[A]n attitude which is decidedly unscientific in the true sense of the word, since it involves a mechanical and uncritical application of habits of thought to fields different from those in which they have been formed. The scientific as distinguished from the scientistic view is not an unprejudiced but a very prejudiced approach which, before it has considered its subject, claims to know what is the most appropriate way of investigating it.

Throughout the eighteenth and early nineteenth century, the study of social phenomena was restricted to research methods that took into consideration the nature and particularities of their object of study. With the rise and the scientific advance of the physical and natural disciplines, however, the meaning of the term science began to allude to the predictability and measurement coming from these disciplines. The resounding success of these fields of study within the natural sciences caused a kind of resentment in disciplines of the social sciences, which began to engage in the 'slavish imitation of the method and language of Science' (espe-

cially physics) in search for they own legitimation' (ibid.). Worse, the tyranny that flooded the social sciences with the methods of the natural sciences, and not with their essence (i.e., according to each object of study), derived from the intentions of natural scientists who advocated the adoption of the methods they practiced *de jure* but not necessarily *de facto*.³

For Hayek, 'Science' in its modern sense, with a capital 'S', arises in opposition to three main movements. Namely, (i) the medieval scholastic influence of studying the great authors of the past and their ideas, a posture much less assumed by extreme conviction than for lack of alternative means; (ii) idealism, the belief that ideas are somehow transcendental and that their world precedes the material world; and, more importantly, (iii) anthropomorphism, the interpretation of causal relationships of external reality as being generated by an intelligent design analogous to a human being, and the pursuit of those intentions as evidence of the existence of this same design. Thus, the reaction 'of modern Science has been to get down to 'objective' facts, to cease studying what men thought about nature or regarding the given concepts the true images of the real world, and, above all, to discard all theories which pretended to explain phenomena by imputing to them the directing mind like our own' (ibid., p. 29).

The main consequence of this process is the reclassification in the natural sciences of the sensory perceptions of men. The external world would now be classified according to other different properties. There is now the development of abstract mental models that used to be incomprehensible through only the mere sensitive experience of reality. Nevertheless, with this new world of objective knowledge provided by Science, the reinterpretation of sensory perceptions is possible. The reclassification process of these sensorial subjective perceptions is, in fact, 'the most characteristic aspect of the procedure of the natural sciences. The whole history of modern Science proves to be a process of progressive emancipation from our innate classification of the external-internal and external stimuli till in the end they completely disappear' (Hayek, 1942-44, p. 33).

Two questions follow. The first is that, for external facts to have some consistency in their behavior, they should be interpreted differently by each individual, based on the particular position from which the facts are presented to them. The question that arises then is how different sensory perceptions are, which appear in different spatial and temporal contexts, perceived in the same way by different people. The second question is that if men perceive similar things from different sensory experiences that correspond to external realities without any correspondence or physical relationship, such fact must be conditioned to important information, and thus serves as a starting point for further discussions.

From this observation, in which the differences between the facts of the natu-

³ The difference between what the 'men of science' *de jure* recommend and what they *de facto* do is not in the original text of the first part of 'Scientism and the Study of Society' (1942), but was added in the 1952 book collection edition of *The Counter-Revolution of Science* due to Karl Popper's critique in *The Poverty of Historicism* (1957) – later accepted by Hayek (1967, p. vii; see also Hayek, 2010, editor's introduction, pp. 36-7).

ral sciences and the facts of the social sciences are clearer, it is possible to infer that Science does not take the subjective knowledge of the sensory perceptions of individuals for granted. Its concern is not what individuals think about external reality and, consequently, how they behave after that perception. Instead, Science is concerned with what individuals should consider when taking into account the natural objective properties and relations of the external world. The role of Science does not concern with the assumptions of what individuals think reality is. *Au contraire*, its role is to constantly modify individual subjective perceptions in order to replace initial sensory knowledge with mental models that organize and relate new elements, generating new classifications of categories and events. However, Hayek (1942-44, p. 39) asks: 'what are the consequences of the fact that people perceive the world and each other through sensations and concepts which are organized in the mental structure common to all of them?' This is the scope of the social sciences. Social sciences are concerned with how men, through individual actions determined by subjective sensory perceptions, construct a world of their own, apart from the purely innate and objective relations of nature.

The social sciences have their own particular object and method: men and their relationships. The social sciences do not deal with physical properties of things, matter, or objects. Rather, it deals with the relationship between human beings and things, along with the relationship between one human being and other human being, which are built through human action. The aim of the social sciences is to explain the unintended or unplanned consequences of the actions of a set of individuals. Men's actions are here understood as conscious or reflected actions, actions among a range of possibilities, rather than unconscious reactions to physical stimuli. Actions are based on the set of the classifications of each individual's sensory perception, and perceptions are the set of opinions of each individual — what the individual subjectively thinks or imagines the external world really is.

It is assumed that the classificatory pattern of external phenomena is compatible among different individuals with different subjective perceptions. If it were not for this, it would be neither possible to understand the actions of each other nor to reach the basic consensus of what 'reality' is. However, there is a certain convergence of perceptions. This is the result of the same common mental structure of classification present in every human being, because there is a mechanism of conciliating a range of diverse sensorial perceptions. That is, the ends of human actions are not of the same objective nature, nor can they be defined according to their physical attributes. 'So far as human actions are concerned the things *are* what the acting people think they are' (ibid., p. 44).

This may be easily seen if one thinks of any tool or instrument. Hayek exemplifies this in the following manner. A hammer is a tool that is not defined as a hammer for its intrinsic physical properties, such as a particular type of iron or wooden handle, but for its purpose as a means to an end, which results from human action. Any property of means and objects for human action must be understood as mental categories of the individual before the means or the object themselves. If the agent of an action does not perceive an object of y physical properties via a z mental model, the physical properties of the object (x, y, w) no longer matter. The

agent will not mentally internalize the potential use of that object as a means for a particular action.

The difference between the natural and the social sciences is evident when one identifies that the object of study of the natural sciences is objective while, for the social sciences, it is subjective. The facts of the social sciences are the subjective opinions or beliefs of individuals, but they are objective data for the observer, the social scientist. Therefore, in a sense, the objects of the social sciences are also objective insofar as they are opinions which support the actions given to the social scientist, regardless of the subjective opinions of the observer. The facts of the social sciences differ from those of the natural sciences because of their subjective character, as they cannot be directly observed within the minds of individuals. They are mental facts that reside in the mental structure of classification and are therefore a constituent part of the inner world or of the subjective internal reality. Indeed, natural facts are material ones, which are ultimately a constituent part of the outside world or objective reality. One is only aware that mental facts exist because they share a common qualifying structure, the brain classificatory apparatus, which allows the recognition of third-party actions via assimilation. Still, perceptions will be conflicting and contradictory to a certain degree, since they are subjective and particular.⁴

Therefore, Hayek (1942-44, pp. 49-50) maintains that subjective, dispersed, and fallible knowledge is present in the very core of the social sciences and of economics.⁵

[T]he concrete knowledge which guides the action of any group of people never exists as a consistent and coherent body. It only exists in the dispersed, incomplete, and inconsistent form in which it appears in many individual minds, and the dispersion and imperfection of all knowledge are two of the basic facts from which the social sciences have to start. What philosophers and logicians often contemptuously dismiss as a ‘mere’ imperfection of the human mind becomes in the social sciences a basic fact of crucial importance.

Hayek draws attention to another singular complication of the social sciences and their method. It is the contrast between the ideas of individuals that motivate

⁴ ‘Take such things as tools, food, medicine, weapons, words, sentences, communications,’ Hayek (1943, p. 59) explains, ‘it is easily seen that all these concepts (and the same is true of more concrete instances) refer not to some objective properties possessed by the things, or which the observer can find out about them, but to views which some other person holds about the things. These objects cannot even be defined in physical terms, because there is no single physical property which any one member of a class must possess. These concepts are not just abstractions of the kind we use in all physical sciences, but they abstract from all the physical properties of the things themselves.’

⁵ It is by using the essentially subjective character of economic theory as a parameter that Hayek argues that economics is the most successful social science, and that ‘it is probably no exaggeration to say that every important advance in economic theory during the last hundred years was a further step in the consistent application of subjectivism’ (Hayek, 1942-44, p. 52, footnote 7; see also p. 54).

actions and *cause* social phenomena and people's ideas about how they perceive the social phenomena, or what *explains* them. That is, 'those ideas which are *constitutive* of the phenomena we want to explain and the ideas which either we ourselves or the very people whose actions we have to explain may have formed *about* these phenomena and which are not the cause of, but theories about, the social structures' (ibid., p. 63). Hayek names the first type of opinions motivational or constitutive, and the second type speculative or explanatory.

While the social sciences attempt to reproduce the complex social phenomenon that stems from individual actions based on motivational opinions (often not amenable to direct observation), the natural sciences assume the complex natural phenomenon as a given reality. Natural sciences try to relate the macro-phenomenon to its individual compositional elements, as opposed to its constitution of individual elements. In the social sciences, only the actions of individuals by assimilation of mental structures are considered empirical data, and the complex social phenomenon is non-observable as a whole. In the natural sciences, the empirical data becomes the complex natural phenomenon itself and the natural scientist does not have direct access to the constitutive elements of the macro-phenomenon.⁶ Thus, the appropriate method for the natural sciences is best described as an analytical, decompositive method of observable complex structures, while the most suitable method for the social sciences is defined as a compositive or synthetic method of the complex order based on observable and intelligible individual actions – for we are men and we have the same mental structure of classification.⁷

The social scientist's task is not to explain the beliefs, opinions, or actions of individuals. If there is scope for such, it is of a different nature, and this is the role of psychology. For the student of society, beliefs and actions are a given to the problem to be answered, as the different intentional human actions produce unplanned and unconscious results by their own actors. Moreover, if there were no regularities or some notion of order in the macrocosm resulting from human action but not from human design, Hayek claims that there would be no task for the social sciences, only for the explanation of the very formation of beliefs, that is, for psychology. The role of the social scientist is to explain how complex institutions that permeate civilization are formed by the result of multiple individual actions with no higher purpose, a process in which '[w]e 'understand' the way in which the result we observe can be produced, although we may never be in a position to watch the whole process or to predict its precise course and result' (ibid., p. 71).

Since we do have access to human action, but not to the complex process that produces institutions, we can explain the latter using the former. We do not have

⁶ Hayek already outlines the idea of dividing the empirical element of the natural sciences and the social sciences in his opening text of *Collectivist Economic Planning* (see Hayek, 1935, pp. 126-7).

⁷ The term compositive is borrowed by Hayek 'from a manuscript note of Carl Menger, who, in his personal annotated copy of Schmoller's review of his *Methode der Socialwissenschaften*... wrote it above the word 'deductive' used by [Gustav von] Schmoller. [...] This is useful and links up with the point that, since the elements are directly known to us in the social sciences, we can start here with the compositive procedure' (Hayek, 1942-44, p. 67, f. 4).

the necessary knowledge of all properties that may influence an outcome to make specific predictions of how the spontaneous order will unfold. The explanation of principle may prohibit certain results from happening, given the explanatory formation of elements known to the observer, but it will still be negative knowledge. The specific prediction of complex social phenomena is simply impossible due to the ignorance of the social scientist regarding all variables that can explain the emerging order. The compositional method is concerned with explanations of possibility of existence.

The inevitable imperfection of the human mind becomes here not only a basic datum about the object of explanation but, since it applies no less to the observer, also a limitation on what he can hope to accomplish in his attempt to explain the observed facts. The number of separate variables which in any particular social phenomenon will determine the result of a given change will as a rule be far too large for any human mind to master and manipulate them effectively. In consequence our knowledge of the principle by which these phenomena are produced will rarely if ever enable us to predict the precise result of any concrete situation. (Hayek, 1942-44, pp. 73-4)

Additionally, the very attempt to explain the mental classification process is subject to an insurmountable barrier. Since our own mind is a classification apparatus, another more complex classification apparatus is necessary to explain it, that is, a classification system cannot logically explain in full detail its own functioning, i.e., the classifications of subjective sensations of external facts. Hayek concludes, *prima facie*, 'that any apparatus of classification would always have to possess a degree of complexity greater than any one of the different things which it classifies; and if this is correct it would follow that it is impossible that our brain should ever be able to produce a complete explanation (as distinguished from a mere explanation of the principle) of the particular ways in which it itself classifies external stimuli' (ibid., p. 86).

In other words, there is an intrinsic limitation to the complexity of the mental classification apparatus in relation to itself and to any complex phenomenon. We are simply unable to formulate a complete, detailed explanation of complex phenomena due to the very limitation of our instrument of classification and our understanding of the phenomenon, that is, our brain structure. The complexity of the phenomenon in relation to its classificatory framework also naturally limits the possibility of predicting it, favoring only the limited pattern prediction from the explanation of principle of the phenomenon.⁸

⁸ Hayek deepens those notions in his treatise on theoretical philosophical psychology, *The Sensory Order* (1952). This work is an important influence to Hayek's methodological view, developing some aspects of 'Scientism.' However, the study of this work does not fall under the scope of this article. There is a growing emphasis given in the secondary literature to Hayek's psychological theory, especially in his methodological view and the evolutionary process of coordination. The adherents of this position even

After listing what the facts and purpose of the social sciences are, Hayek discusses the three main philosophical versions of scientism. These intellectual movements ignore the particular object and method of social sciences and attempt to transplant natural science methods into branches of scientific knowledge outside of what they were designed to encompass. They are, namely, objectivism, collectivism, and historicism. We will hereinafter briefly summarize Hayek's argument against these three movements.

Objectivism is based on the rejection of any methodological importance of the subjective knowledge in the study of social interactions. Clinging to the objective and physical properties of the natural physiological elements, at Hayek's time one of its contemporary protagonists was the physicalism of Otto Neurath. However, as previously seen, this is not possible for Hayek because our own perception of the external world is mediated by a mechanism of classifications that does not necessarily group or relate sensations according to their physical properties. In addition, every individual, according to his or her classification set, interprets and has different subjective sensations to the same objective stimuli. Collectivists, on the other hand, fall into scientism because they understand as empirical data a collective imaginary aggregate made by abstract hypotheses and construction. Collectivists seek empirical regularities in the complex phenomena of aggregates and attempt to deduce their elements via analysis, that is, it is an imitation of the decompositive method of the natural sciences.

Regarding historicism, Hayek contrasts the old historical view, which denied the possibility of a theoretical science of history, with the scientific historical view. Historicism, the historical view modified by scientism, advocates history as the only possible scientific discipline that can base and inform a theoretical science of social phenomena. However, Hayek points out that every kind of thought or mental classification involves some degree of abstraction. Moreover, our own mental structure is an abstract classificatory mechanism of external physical stimuli and sensations. Therefore, a *theoretical* science of history would be impossible, since the very selection of the object of study already involves abstract classificatory processes. There are, in the historicist and scientific approaches, the darling vice of meta-narratives of general historic laws that are analogous to natural laws drawn from history, which simply exclude any possibility of human fallibility and action. For Hayek, the most striking examples of this position are those of Henri de Saint-Simon, Auguste Comte, Georg W. F. Hegel, and Karl Marx.

CONCLUSION

The present article sought to show the emergence elements of complexity in Hayek's 1940s methodological texts. Those texts were associated by Hayek ([1952] 1979, pp. 10-1) himself and by Caldwell (2004a) to the first three parts of the Abuse

call themselves neuro-Hayekians. On *The Sensory Order* see, e.g., Butos and Koppl (1993, 2006), Birner (1999), Horwitz (2000), Caldwell (1994, 2004a, 2004b), and Di Iorio (2010).

of Reason Project. They indicate how Hayek would end up in the complexity approach from his methodological critique. As explained throughout the text, from the explicit recognition of the problem of knowledge, the development of this project caused Hayek to criticize the misuse of reason and the exaggerated belief in its potential by intellectual traditions of history of ideas. Additionally, Hayek criticizes the improper and acritical methodological importation of other sciences to areas for which these same methods are inadequate.

From this methodological critique and development in the Abuse of Reason Project, Hayek absorbed the more recent and modern language of the then contemporary philosophy of science (especially Popper's falsificationism) and complexity. Hayek only reaches the full maturity of his methodological position in 'Degrees of Explanation' (1955) and 'The Theory of Complex Phenomena' (1964). In the 1950s, Hayek changes the qualitative dichotomic demarcation between natural and social sciences as explained by the objective and subjective phenomena in which each discipline deals with, as discussed above. Hayek adopts a continuum quantitative criteria based on the complexity degree of the phenomena analyzed and definitively paved his path to complexity. Hayek (1964, p. 25) defines the complexity degree of a phenomena or pattern as "[t]he minimum number of elements of which an instance of the pattern must consist in order to exhibit all the characteristic attributes of the class of patterns in question."

In both the mentioned essays, Hayek accepts *prima facie* the Popperian falsificationism, but exposes the precariousness and the limits of the scientific power of explanation, prediction, and falsification in theories of complex phenomena. As argued by Oliva (2016), from the mid-1950s, Hayek would explicitly address the issue of complexity, treating economics in a way that was connected to other fields of knowledge that study unintended complex phenomena. Hayek (1964, pp. 39-40) sustains that complex phenomena teach the ultimate importance of human ignorance about the world. He argues that

[W]e take our ignorance more seriously. As Popper and others have pointed out, 'the more we learn about the world, and the deeper our learning, the more conscious, specific, and articulate will be our knowledge of what we do not know, our knowledge of our ignorance'. We have indeed in many fields learnt enough to know that we cannot know all that we would have to know for a full explanation of the phenomena.

As the title of his Nobel lecture states, 'The Pretence of Knowledge' (1974), Hayek would be worried about outdoing the scientific, modernist wave and exposing how fragile is founded the basis of much of the alleged knowledge that we believe to be valid and controllable. In Hayek's view, this false reason, or its pretense of knowledge, may end up causing harmful social consequences, such as intellectual support for authoritarian regimes – as he intended to portray in the fourth part of the Abuse of Reason Project.⁹

⁹ To be clear, this is not to say that Hayek came to his methodological critique in the Abuse of Reason

REFERENCES

- Barbieri, Fabio (2013). "Complexity and the Austrians". *Filosofía de la Economía*, 1(1): 47-69.
- Birner, Jack (1999). "The surprising place of cognitive psychology in the work of F.A. Hayek". *History of Economic Ideas*, 7(1): 43-84.
- Boettke, Peter (2002). "Information, knowledge and the close of Friedrich Hayek's system: a comment". *Eastern Economic Journal*, 28(4): 343-349.
- Boettke, Peter; Shaeffer, Emily; Snow, Nicholas (2010). "The context of context: the evolution of Hayek's epistemic turn in economics and politics". *Advances in Austrian Economics*, 14: 69-86.
- Butos, William; Koppl, Roger (1993). "Hayekian expectations: theory and empirical applications". *Constitutional Political Economy*, 4(3): 303-29.
- Butos, William; Koppl, Roger (2006). "Does the sensory order have a useful economic future?" *Advances in Austrian Economics*, 9: 19-50.
- Caldwell, Bruce (1988). "Hayek's transformation". *History of Political Economy*, 20(4): 513-41.
- Caldwell, Bruce (1994). "Hayek's Scientific Subjectivism". *Economics and Philosophy*, 10(2): 305-13.
- Caldwell, Bruce (1997). "Hayek and Socialism". *Journal of Economic Literature*, 35(4): 1856-1890.
- Caldwell, Bruce (2004a). *Hayek's Challenge: An Intellectual Biography of F.A. Hayek*. Chicago: University of Chicago Press.
- Caldwell, Bruce (2004b). "Some Reflections on F.A. Hayek's The Sensory Order". *Journal of Bioeconomics*, 6(1): 1-16.
- Di Iorio, Francesco (2010). "The Sensory Order and the Neurophysiological Basis of Methodological Individualism". *Advances in Austrian Economics*, 13: 179-209.
- Fleetwood, Steve (1995). *Hayek's Political Economy: The Socio-Economics of Order*. London: Routledge.
- Gray, John (1986). *Hayek on Liberty*. London: Routledge.
- Hayek, Friedrich A. (1935). "Socialist Calculation I: The Nature and the History of the Problem". In Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1937). "Economics and Knowledge". In Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1941). "The Counter-Revolution of Science". In Hayek, Friedrich A. (1952 [1979]). *The Counter-Revolution of Science: Studies on the Abuse of Reason*. Indianapolis: Liberty Fund.
- Hayek, Friedrich A. (1942-44). "Scientism and the Study of Society". In Hayek, Friedrich A. (1952 [1979]). *The Counter-Revolution of Science: Studies on the Abuse of Reason*. Indianapolis: Liberty Fund.
- Hayek, Friedrich A. (1943). "The Facts of the Social Sciences". In Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1944 [2007]). *The Road of Serfdom: Text and Documents*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1945). "The Use of Knowledge in Society". In Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1946). "Individualism: True and False". In Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1948 [1980]). *Individualism and Economic Order*. Chicago: University of Chicago Press.
- Hayek Friedrich A. (1951). "Comte and Hegel". In Hayek Friedrich A. (1952 [1979]). *The Counter-Revolution of Science: Studies on the Abuse of Reason*. Indianapolis: Liberty Fund.
- Hayek, Friedrich A. (1952 [1979]). *The Counter-Revolution of Science: Studies on the Abuse of Reason*. Indianapolis: Liberty Fund.

Project and adopted the complexity language only to make a critique of certain political philosophies and ideologies. On the contrary, the methodological critique is a positive, non-normative development of his singular research program based on the coordination of knowledge problem.

- Hayek, Friedrich A. (1952). *The Sensory Order: An Inquiry into the Foundations of Theoretical Psychology*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1955). "Degrees of Explanation". In Hayek, Friedrich A. (1967). *Studies in Philosophy, Politics and Economics*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1960). *The Constitution of Liberty*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1964). "The Theory of Complex Phenomena". In Hayek, Friedrich A. (1967). *Studies in Philosophy, Politics and Economics*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1967). *Studies in Philosophy, Politics and Economics*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1973-9). *Law, Legislation, and Liberty*. Chicago: University of Chicago Press.
- Hayek, Friedrich A. (1974). "The Pretence of Knowledge". In Hayek Friedrich A (1978). *New Studies in Philosophy, Politics, Economics and the History of Ideas*. London & Melbourne: Routledge & Kegan Paul.
- Hayek, Friedrich A. (1983). "Nobel Prize Winning Economist". In Armen Alchian (Ed.) UCLA, Charles E. Young Research Library, Department of Special Collections, Oral History Transcript n. 300/224. Available at <https://archive.org/details/nobelprizewinnin00haye>. (Accessed on 13/02/2020).
- Hayek, Friedrich A. (2010). *Studies on the Abuse and Decline of Reason: Text and Documents*. Chicago: University of Chicago Press.
- Horwitz, Steven (2000). "From The Sensory Order to the Liberal Order: Hayek's Non-Rationalist Liberalism". *The Review of Austrian Economics*, 13(1), 23-40.
- Kirzner, Israel (1988). "The Economic Calculation Debate: Lessons for Austrians". *The Review of Austrian Economics*, 2(1): 1-18.
- Mauerberg Junior, Arnaldo (2013). "A Complexidade e o Construtivismo na Economia". *Revista de Economia Política*, 33(3): 446-462.
- Nolan, Mark Charles (2013). "Hayek's 1945 Finlay Memorial Lecture: Tracing the origins and evolution of his 'true' individualism". *The Review of Austrian Economics*, 26(1): 53-71.
- O'Driscoll, Gerald (1977). *Economics as a Coordination Problem: The Contributions of Friedrich A. Hayek*. Kansas City: Sheed Andrews & McMeel.
- Oliva, Gabriel (2016). Hayek and complexity: coordination, evolution and methodology in social adaptive systems. Master's thesis, Graduate Program in Economics, University of São Paulo. Available at <http://www.teses.usp.br/teses/disponiveis/12/12138/tde-06072016-152628/pt-br.php>. (Accessed on 13/02/2020).
- Paulani, Leda Maria (1996). "Hayek e o Individualismo no Discurso Econômico". *Lua Nova*, 38: 97-124.
- Popper, Karl (1957). *The Poverty of Historicism*. London: Routledge & Kegan Paul.
- Steele, Gerald (1993). *The Economics of Friedrich Hayek*. New York: Palgrave Macmillan.
- Vaughn, Karen (1999a). "Hayek's Implicit Economics: Rules and the Problem of Order". *The Review of Austrian Economics*, 11(2): 129-144.
- Vaughn, Karen (1999b). "Hayek's Theory of the Market Order as an Instance of the Theory of Complex, Adaptive Systems". *Journal des Économistes et des Études Humaines*, 9(2-3): 241-256.

