

# Hayek in the lab. Austrian School, game theory, and experimental economics

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**ABSTRACT.** Focusing on the work of Friedrich von Hayek and Vernon Smith, we discuss some conceptual links between Austrian economics and recent work in behavioral game theory and experimental economics. After a brief survey of the main methodological aspects of Austrian and experimental economics, we suggest that common views on subjectivism, individualism, and the role of qualitative explanations and predictions in social science may favour a fruitful interaction between these two research programs.

**KEYWORDS:** Austrian School of economics, game theory, experimental economics, Friedrich A. von Hayek, Vernon Smith

## 1. Introduction

The Austrian School of economics is well-known for its aversion both to mathematical and formal analysis, and to experimental and empirical methods in the social sciences. This position led many modern Austrians to dismiss as irrelevant, or plainly reject, various valuable insights from recent research in the field.

Focusing on the work of Friedrich von Hayek and Vernon Smith, I argue that the reasons for this position are more historical than conceptual, and that fruitful interactions between different Austrian research programs and some recent developments in behavioral game theory and experimental economics are indeed possible. In Section 2, I briefly survey some methodological aspects of Austrian and experimental economics. Then, in Section 3, I argue that many results in the latter field are largely compatible with, and may offer strong support to, Austrian theoretical and methodological views.

## 2. Austrian and experimental economics

**Basic Austrian methodological views.** According to the Austrian School — from Carl Menger to Ludwig von Mises, Friedrich von Hayek, and Israel Kirzner —, economics is not an experimental science, laboratory experiments are impossible or irrelevant in social sciences, and economic theories are not empirically testable in the same way the theories in the natural sciences are. Austrians adopt a radical subjective approach to the theory of value and of economic decisions (cf. Buchanan 1969), combined with a strong form of methodological individualism based on the theory of spontaneous order. Moreover, they defend a rigorous anti-positivist and anti-reductionist view of the social sciences, and reject as detrimental or, at best, inappropriate, what Hayek (1952) dubbed “scientism”, i.e., the application of the methods of natural sciences to the analysis of social phenomena.<sup>1</sup> Mises (1949, p. 31), for instance, maintains that “no laboratory experiments can be performed with regard to human action” and that “neither experimental verification nor experimental falsification of a general proposition are possible in [economics]”. Hayek (1935, p. 126) echoes Mises’ views arguing that “in the social sciences [...] experiment is impossible, and we have therefore no knowledge of definite regularities of the complex phenomena in the same sense as we have in the natural sciences” (see also Hayek 1952, pp. 41 ff.). Interestingly, Hayek (1978, p. 180) himself was perhaps the first to

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<sup>1</sup> From the point of view of “orthodox” or “mainstream” (neoclassical) economics, this methodological stance relegates the Austrian School among the “heterodox” approaches, or at least among the peripheral branches of the discipline (cf. Hausman 2008, section 1.2). For a brief, up-to-date survey of the history, significance, and main results of the Austrian School see White (2008).

conceive (if only to dismiss it) the very possibility of testing economic hypotheses through laboratory experiments: “the validity of the theory [of competition] can never be tested empirically. We can test it on conceptual models, and *we might conceivably test it in artificially created real situations, where the facts which competition is intended to discover are already known to the observer.* But in such cases it is of no practical value, so that to carry out the experiment would hardly be worth the expense.” (italics added; cf. Smith 2008, pp. 39 and 291).<sup>2</sup>

**Experimental economics as an Austrian research program?** In sharp contrast with the Austrians’ position, during the last decades experimental methods have been increasingly applied in economics to test theoretical hypotheses and to study specific instances of their application, involving both real agents and computer-based simulations. In 2002, the Nobel prize was awarded to the psychologist Daniel Kahneman for his pioneering research on behavioral economics (most of which conducted with Amos Tversky), and to Vernon Smith, the father of experimental economics. Kahneman and Tversky applied the methods of cognitive science, especially psychology, to the analysis of individual decisions in real-world situations, later extended also to strategic contexts, as studied in behavioral game theory (Camerer 2003). Smith promoted the use of laboratory experiments to study real agents involved in strategic interactions (market exchanges, auctions, cases of public goods provision and problems of resource sharing) in order to test their behavior against the predictions of general equilibrium and game theory and study the efficiency and welfare implications of economic institutions (double auction, property rights, etc.).

In these experiments, participants are only given the private information about some specific aspects (e.g., prices, costs, or quantities of some good) of the experimental design, which is only known to the experimenter in its entirety.<sup>3</sup> In contrast with much standard theorizing, experimental participants

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<sup>2</sup> It may be noted that the traditional view of economics as a non-experimental science was, until recently, plain common-sense in the profession, as testified, e.g., by Samuelson’s classic textbook (Samuelson and Nordhaus 1985, p. 8): “Economics [...] cannot perform the controlled experiments of chemists or biologists because [it] cannot easily control other important factors. Like astronomers or meteorologists, [economists] generally must be content largely to observe.” See also Sugden (2005).

<sup>3</sup> The principles of economic experimental design are the subject of so-called *induced value theory* as developed by Smith (1976).

often outperform *homines æconomici* in market interactions: for instance, even small groups of economic agents, lacking complete information and perfect rationality, quickly converge on the theoretical equilibrium price. Moreover, real agents easily learn to correct “mistakes” and to approximate the “optimal” behavior predicted by theoretical models. Although economic institutions (e.g., different kinds of auction) affect in a decisive manner the outcome of experiments, results of this kind are robust to replication and variation of experimental design.

In spite of its experimental character, this line of research shows surprising affinities with a number of Austrian insights. Somehow paradoxically, Smith (1999, 2005, 2008) explicitly considers much of his research as a demonstration of some key Austrian ideas, and presents the whole enterprise of experimental economics as a “Scottish-Hayekian” research program (Smith 2008, Chs. 1 and 13). In fact, a good deal of experimental work has been devoted to some traditional Austrian, and more precisely Hayekian, themes. These include what experimentalists call the “Hayek–Kirzner hypothesis” — i.e., the idea that prices embody agents’ private information, on which competitive markets efficiently economize, and that profit opportunities evoke entrepreneurial discovery — which has been repeatedly tested in the lab (e.g., Smith 1982, Demmert and Klein 2003, and Kitzmann and Schiereck 2005). Another example is the laboratory replication of the emergence of spontaneous institutions (like market exchange and specialization) described by Crockett, Smith, and Wilson (2009). In the next section, some crucial connections between the experimental approach and Hayek’s methodological views are briefly presented and discussed.

### **3. Subjectivism, individualism and qualitative explanations/predictions**

The development of experimental economics and behavioral game theory has recently attracted the attention of both philosophers of science and economists with an interest in methodological questions (cf. for instance Guala 2005, Sugden 2005, 2008, and Hausman 2008, Section 4.5). A small number of scholars focused on the relationships and potential interactions between Austrian and experimental economics and game theory (Foss 2000, Holcombe 2009, Oprea and Powell 2010, Festa 2011). Although many modern Austrians are skeptical about these connections (Oprea and Powell 2010, p. 149), others go so far

as to plainly argue that “the field of experimental economics should be seen as a direct descendent of Hayek’s political economy” (Boettke, Coyne, and Leeson 2008, p. 93). At the very least, it seems safe to conclude that “[t]here is no inherent methodological divide between experimental and Austrian economics and there are many potential gains from exchange” (Oprea and Powell 2010, p. 160). The following comparison between Hayek’s and Vernon Smith’s work on some central topics of common interest aims at supporting this general conclusion.

**Epistemic subjectivism.** Hayek (1967) has famously characterized the central question of economics as the “knowledge problem”, i.e., how the information dispersed amongst the numberless members of the society is collected and organized in the market. More generally, Austrians have paid great attention to the epistemic dimension of economic interactions, insisting that they should be analyzed by taking into account the specific beliefs, epistemic capacities, and cognitive limitations of the individuals involved. This view is in agreement with (now) classical work in economics and game theory (Bicchieri 1993, 2006; Schelling 1960; Simon 1982-1997) and receives strong support from experiments, where less-than-perfectly informed and rational agents can successfully coordinate in market exchanges (Smith 2008). In turn, this contradicts the often repeated idea that markets can adequately work only when the neoclassical assumptions of complete information and perfect rationality are at least approximately satisfied.

**Methodological individualism.** Austrian methodological individualism is the view that social macro-phenomena must be explained as emerging from the unintended consequences of individual actions, and that social institutions, conventions, rules and norms can be analyzed as *spontaneous orders*, i.e., in Adam Ferguson’s words (Hayek 1967, p. 96) as the result of human action but not of human design. More recently, this theme has been also explored in game-theoretic analyses of the emergence and evolution of social cooperation (e.g., Sugden 2004), as well as in the growing literature on evolutionary psychology (e.g., Ridley 1996, Bowles and Gintis 2011). As Smith (2005, pp. 138–139) notes, this view is strongly corroborated by laboratory experiments, which offer real-world demonstrations of the emergence of institutions as the result of “invisible hand” processes, which participants are only partially aware of and can not predict or control.

**Explanations of the principle and pattern predictions.** According to Hayek (1967, Ch. 1–2), precise quantitative explanations and predictions are precluded to social sciences, which aim instead at “explanations of the principle” and qualitative “pattern predictions” about complex phenomena. As Oprea and Powell (2010, p. 153) point out, “experimental economics can be understood as an empirical method for developing pattern predictions of the sort suggested by Hayek”, i.e. for disclosing the underlying tendencies of human behavior. This kind of study also shares strong family resemblances with the simulations proposed within evolutionary game theory and agent-based modeling (Axelrod 1984, 1997; Seagren 2010; Skyrms 1993, 2004), which aim at revealing the emerging patterns of action in multi-agent contexts, the complexity of which precludes the application of standard analytical methods.

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