



# Integration and the Disunity of the Social Sciences

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## 1.1 Introduction

There is a plurality of theoretical approaches, methodological tools, and explanatory strategies in the social sciences. Different fields rely on different methods and explanatory tools even when they study the very same phenomena. We illustrate this plurality of the social sciences with the studies of crowds. We show how three different takes on crowd phenomena—psychology, rational choice theory, and network theory—can complement one another. We conclude that social scientists are better described as researchers endowed with explanatory toolkits than specialists of some specific social domain. Social scientists' toolkits are adapted for identifying and specifying the role of specific causal factors among the multiple factors that produce social phenomena. These factors can be, in a nonexclusive way, economic incentives, psychological processes, the ecology, or aspects of the social and cultural environment.

The plurality of methods and theories in the social sciences flies in the face of the project to unify the sciences associated with the positivists of the nineteenth and twentieth centuries. Yet, the compatibility and consilience of theories and practices still have epistemic value: they enable the development of more powerful and robust theories and they allow the advent of interdisciplinary studies. We present the integrative stance as the will to improve compatibility and consilience across fields, yet recognize that the plurality of causes of social phenomena invite a diversity of methodological and theoretical tools. We conclude by characterizing naturalism as an integrative stance applied to fields that belong to the social science *and* to the natural sciences.

## 1.2 The Unity of the Social Sciences: A Failed Project

The strong unity model associated to positivists such as Carl Hempel and Ernst Nagel holds that social facts reduce to facts about individuals, which in turn can be reduced to biological, chemical, and ultimately physical facts. Disciplinary boundaries do not necessarily correspond to the organization of nature; they are arbitrarily drawn by



scientists. Furthermore, the methods and aims of the social sciences should be modeled on those of the natural sciences, as ultimately everything could be explained in physical terms. Although this view has generally fallen into disrepute, its specific answers to the ontological, disciplinary, and methodological objectives remain hotly debated. For instance, some social scientists would advocate methodological individualism in the social sciences, arguing that social phenomena should be explained in terms of individual behaviors and their aggregation. But some other social scientists recommend methodological holism—social facts can appear in scientific explanations (Zahle 2016).

In spite of these attempts to single out the specificity of the social sciences, explanations of social phenomena remain very diverse. For instance, an explanation in economics relies on modeling an economic agent as a rational individual maximizing her own expected utility. Such assumption is at odds with standard explanations in sociology, which appeal to the social milieu as a determinant of individuals' behaviors. It is hard to find a methodological principle and/or a theoretical claim that would characterize or unify all explanations in the social sciences. What is in fact striking is the diversity of methods and theories in the social sciences compared to the relative unity of other scientific disciplines. Given the lack of consensus, the social sciences have de facto followed a generally pluralistic philosophy: Different social sciences develop their own methods for studying the social world, yet often with their disciplinary boundaries overlapping in such a way that the very same social phenomena are investigated and explained in radically different ways.

Contrary to this stance of “default pluralism,” we argue in favor of a methodological pluralism: make the most of different approaches, as they can bring explanatory insights, and yet strive for integration. Successful integration makes apparent the complementarity of different theories and methods for explaining a given social phenomenon. We argue that deploying a plurality of methods and theories for studying, understanding, and explaining some social phenomena and asking different questions is often justified because social phenomena result from a multiplicity of causal factors. Different methodologies and theories might be needed for identifying and describing these causal factors. When that is the case, the methods and theories are complementary to one another, giving a richer, deeper understanding of the social world. We illustrate this diversity with explanations of crowd phenomena.

### 1.3 Explanations of Crowds

How, why, and when do crowds form and dissipate? Crowds are the archetype of social phenomena. At first glance, it seems that crowds would form a well-identified and characterized object of scientific investigation—a social kind, so to speak. It turns out, however, that there is no satisfactory scientific characterization of crowd. There are no constitutive factors or defining traits for identifying a category of social phenomena whose extension would cover our intuitive notion of crowds. The notion of crowd is, in that respect, similar to the notion of tree. One is very able to recognize a tree, but there is no scientific category for trees. In spite of this, scientists can well describe why

a birch or an oak is the way it is. Likewise, social scientists can investigate the causes of a specific crowd formation. In this section, we show that an understanding of any specific crowd is likely to require drawing on very diverse explanatory tools. In Sections 1.4 and 1.5, we examine how different approaches studying a same phenomenon yet with different tools and theories can be integrated and provide a richer understanding of the phenomenon.

### 1.3.1 Crowd Psychology: Imitation and Contagion

The classical accounts of crowding developed at the turn of the nineteenth century (Le Bon 1896; Tarde 1901, 1903; Trotter 1916; Freud 1989). These accounts appeal to psychological concepts like contagion, herd instinct, imitation, and group mind. Each of these concepts has been invoked to explain the commonality of sentiment and behavior that seem to be at the root of crowding. For instance, “contagion” is a metaphor for the transmission of ideas or behavioral inclinations among agents, much as disease is transmitted through a population. But how? Through what mechanism? Some authors appeal to the effect of facial expressions on others, some to chants; some appeal to the herd instinct, which purportedly drives humans to cluster together into ever-larger groups. These psychological notions point to the relevance of mental phenomena in producing the behavior that eventually constitutes a crowd. Crowds appear when people do the same things at the same time—marching, chanting, and having aggressive or fearful behaviors. The similarity can arise because of similar reaction to a single event: for instance, a fire might cause people to flee from the burning building independent of the fact that others similarly flee. In many cases of crowds, however, the behaviors are interdependent: the choices and emotions of one individual influence the choices and emotions of the others. This strong social influence has been grasped by the authors mentioned above.

While studies of crowd behavior started at the beginning of the twentieth century with thought-provoking speculations on its psychological bases, current studies of the relevant psychological underlying mechanisms involve laboratory experiments testing hypotheses specified with the technical vocabulary of cognitive science. The specification of the herd instinct and dispositions to imitate, as psychological traits shared by all humans, has led to numerous work in psychology, especially when investigating what, in human psychology, allows for the emergence of culture (Tomasello 2009; Mesoudi 2016). The existence of a herd instinct and “compulsive imitation” has, however, been largely challenged by other authors working on cultural evolution and its psychological foundations (Morin 2015). Crowd behaviors such as marching or breaking things together are some type of joint actions. Recent cognitive studies investigate to what extent these can be caused by processes of “entrainment,” simultaneous affordance, simulation mechanisms, joint attention, and so on (see Knoblich and Sebanz 2008). Crowd behavior might also involve the rapid spread of emotions. Cognitive science, again, investigates with laboratory experiment how and why emotions can spread in crowd contexts: the emotions can result from the social connectedness of doing things together (Marsh et al. 2009) and it can be rapidly transmitted through face perception (Dezecache et al. 2013). The investigations are enabled by the methodological tools



of behavioral experiments but also by conceptual and interpretive tools from larger psychological theories, such as theories of embodied cognition and social cognition. For instance, Dezecache, Jacob, and Grèzes (2015) use evolutionary psychology to interpret results and formulate hypotheses about emotional contagion.

Although enlightening, there are several limits to explanations of crowd phenomena on the basis of contagion of emotions and automatic imitation of others' behaviors. For one, participation to crowd might be motivated by reasons rather than induced by spontaneous cognitive processes such as compulsive imitation. For another, the environmental factors are neglected in the merely psychological explanations. We now turn to these other factors, which can contribute to the formation of crowds.

### **1.3.2 Rational Choice: Unintended and Intended Crowd Formation**

Rational choice theory remains one of the main tools of the social sciences. It includes a set of assumptions about how agents make decisions: they are rational, which means they make the best choices for achieving their goals, given their limited knowledge. Sometimes, the rationality assumptions are supplemented with the presumption that economic agents' goal is to maximize material gains. Rational choice theory is strongly criticized by both sociologists and psychologists on the ground that it includes false assumptions about human decision-making: contrary to the model of rational choice, humans are often not able to select the best means for achieving their goals. Kahneman and Tversky's work in behavioral economics provided strong evidence that people's choices often depart from what the theory of rational choice would predict (see, Gilovich, Griffin, and Kahneman 2002). Still, there remains several ways to use rational choice theory as a tool for explaining social phenomena. One way is to interpret rational choice models of specific phenomena as "as if" models. This interpretation favors predictive power over explanatory value, since it does not identify the actual causes of the phenomena.

A second way is to use rational choice theory as providing a well-justified baseline for the study of human behavior because animal cognition, human or not, is adaptive. Cognition is a function of some organisms that consists in processing information so as to produce behavior that increases fitness. It is therefore likely to select the best means for achieving goals that are themselves proxy for maximizing fitness (sexual desires, for instance). In that sense, rational choice theory can be a useful tool for the study of nonhuman behavior as well as human behavior. It is not necessarily a good description of the psychological mechanisms, but it is likely to be a good first approximation.

A third way to interpret and use rational choice theory consists in making the minimal assumption that, in the specific case at hand, the choices of agents are motivated. The choices are sensitive to incentives. The use of rational choice theory is, in such case, not a set of axioms for formalizing social phenomena, but a heuristic way to formulate empirical hypotheses, which are then put to the test. This heuristic is justified because of the second point mentioned above: cognition is adaptive. So far, a minimal core of rational choice theory has often proved to be true: economics has provided a rich set of cases showing that people's choice are best explained as being



sensitives to incentives and risk. The popular book *Freakonomics* (Levitt and Dubner 2005) provides beautiful illustrations of such explanations, enabling to uncover the surprising effect of some incentives.

For this chapter, we will focus on the insights that rational choice theory brings for explaining crowd formation. One such illustration is the crowd forming in one restaurant, while the restaurant next door remains empty. The cognitive and social processes go as follows: passers-by want to eat in a good restaurant but have no knowledge about whether the restaurant on the right is better than the restaurant on the left. The first group decides at random; it goes to the restaurant on the right. The second group then decides on the basis of the fact that the restaurant on the right has clients while the one on the left has none. Without further information, the best bet is to rely on the choices of others and go to the restaurant on the right. This is what the second group does. The same thing happens again and again, so that the restaurant on the right becomes crowded and the one on the left remains empty. People end up all doing the same thing and forming a crowd, in spite of the fact that they have no interest in doing so. Still, people make the best decision given that the information they have is only, or mainly, derived from their observation of the choice of others. Such phenomena, called information cascade, provide an example of crowding because of the rational choice of people who do not want to create a crowd. It is based on the testable hypothesis that people take these specific decisions (going to a restaurant in our illustration, but other actual phenomena) on the basis of information that they derive from observing the behavior of others. There are other conditions where crowds appear as unintended consequences of people making the best choice for themselves. The Braess's paradox, for instance, describes the conditions in which traffic jams are caused by actually improving on the available roads and creating highways. One situation for this to happen is pictured in Figure 1.1: there are 4,000 people commuting from one city (start) to the other (end) every morning, and these two cities are connected by two roads. The traveling time is forty-five minutes for covering one trunk of the road (a small road) plus the number of users of travelers on the other trunk, divided by 100. Because of rational choice, half of the population takes one road, while the other half takes the other road. It thus takes sixty-five minutes to go from start to end. However, one improvement in the road structure—building a highway between A and B—leads commuters to take one path and neglect the alternatives, which are now comparatively longer. They do so because they want to minimize their commuting time, but the

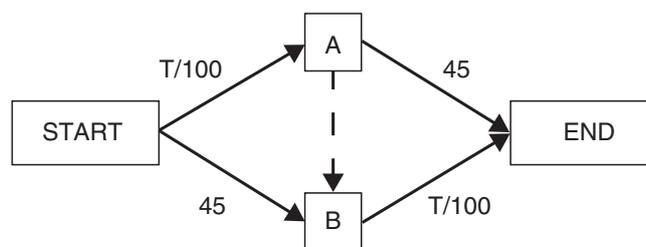


Figure 1.1 Illustration of the Braess's paradox

unintended consequence is that the road is crowded. With all people taking the same road, the travel time is now eighty minutes.

There are also cases where a crowd is formed because people do actually want to form a crowd. In such cases, rational choice theory helps specifying the cognitive problems that need to be solved in order to coordinate for forming a crowd. The problems occur when many people are motivated to participate to a crowd, yet these people know that there is no such crowd to participate to. Thus, in spite of their desire to come together to form a crowd, they fail to do so. How is this problem solved in real life? An example is provided by the Arab Spring, a set of revolutions that took place in North Africa in the years 2010–12. One key event of the Arab Spring is the crowd that gathered in Tahrir Square, in Cairo. This crowd formed for expressing their preferences for a change of regime. Yet, the preference for changing the regime of Mubarak and the willingness to express this preference did not come from one day to the other. The motivation for participating to a demonstration and forming a crowd was present throughout the Egyptian population for some time, but the coordination problem prevented the formation of a crowd. Indeed, expressing one's disagreement with the regime was not without danger; yet it could be done with more safety as a collective action. A first problem, in collective action, is to agree on a time for action. When people cannot talk and agree on this matter, this is a hard task. One salient event can provide the required information: now is the good time! This salient event enables solving the coordination problem—it is a Schelling point (Cronk and Leech 2012). In the Arab Spring, the salient event was provided by the events in Tunisia, which was the first of the North African countries to undergo a successful uprising, with the fall of Ben Ali in 2011. The action of Mohammed Bouazizi, a Tunisian street vendor who self-immolated, might also have provided the first coordinating signal that it was now time to demonstrate (Howard and Hussain 2011).

The crowd in Tahrir Square was first and foremost caused by a desire, shared by many, to express their dissatisfaction with the Mubarak regime. However, an analysis of coordination problem with the tools of rational choice theory points out that this desire is not enough. Beliefs about what others will do are crucial, as revealed by a rational choice theory analysis.

### **1.3.3 Network Science and the Ecology of Crowd Formation**

The above explanations make one causal factor of crowd formation apparent: the means of communication and how they connect people. The Arab Spring has often been qualified as Twitter or Facebook revolutions. Some have argued that one key feature of the Arab Spring was the reliance of the demonstrators on New Information Technology (Howard and Hussain 2011; Stepanova 2011). Some others have argued that social media had a modest impact, while television and word of mouth were the most important source of information (Williams Associates 2011; Friedman 2011). The penetration of Twitter in Egypt around the time of the revolution was low: about 12,000 subscribers out of a population of 80,000,000. At the same time, there were 3.5 million Facebook users: a 4.5 percent penetration rate (Dunn 2011). Still, the penetration of internet users in Egypt had skyrocketed in the decade leading up to

the Arab Spring, with 17 million users online by May of 2011, about 21 percent of the population (Stepanova 2011).

Le Bon and Tarde did, in their time, already mention the role of mass communication (LeBon 1896, 137; Tarde 1901, 7–11), but the recently developed field of network science makes its systematic study possible. Network science applies mathematical analysis for describing patterns of interconnections among a set of things. Relying on the mathematics of graph theory, it conceives connections as vertices in a graph and the connected things as nodes of that graph. Network science can be used for the analysis of diverse phenomena, such as the modeling of the spread of disease in an epidemic and the spread and containment of forest fire (Porterie et al. 2007). For us, however, the relevant applications of network science concern the “connectedness” of social agents and the spread of specific behavior. In this context, connections might be communication links, “friend” relation in Facebook, or physical connections.

We saw in the previous section that crowds might arise when a coordination problem that involves a large number of people is being solved. Coordination can be achieved when the same action-triggering information is distributed to many people in a short time. Network science shows that it is possible when the network of communication allows for rapid spread of coordinating information. What types of network allows for this rapid spread? This is made possible when a few nodes are extremely popular and thus able to distribute the information at once to many other nodes. In other words, the existence of hubs—highly connected nodes—can play a crucial role in crowd formation and maintenance. Thus, during the Arab Spring, the Facebook account of Wael Ghonim played the role of a hub for distributing coordinating information. In a demonstration, this role of distributing coordinating information can be taken by the person who holds the megaphone: the network, in that case, is constituted of nodes that represent members of the demonstration and links that represent who hears whom.

One observation made by early scientists of crowd (LeBon 1896, 34–5) was that crowds seemed to be answering the will of one single individual—the leader—or at least one “idea.” We interpret this intuition about crowds as related to the coordinated action of people forming a crowd. Network science can therefore specify this intuition: the leader, if any, is not necessarily an individual with official leadership. It is the individual that is a hub. Also, the ideas that seem to belong to the crowd in virtue of holding it together are coordinating ideas that are shared by the participants of the crowd.

Another property of networks can provide insights in the formation and maintenance of crowds. When links in a network express hyperlinks in the web, friendship, or any type of social connection, the number of links connecting a node provides a measure of popularity of that node. For instance, there are many more links to the pages of Wikipedia than to the ResearchGate homepages of this chapter’s authors. The former is more popular than the latter. Networks that express popularity evolve: new links are created, and some are deleted. One factor for the creation of a new link toward a node is how much this node is already connected. Indeed, an individual with many friends is more likely to meet new people, by means of his existing friends, than someone with few friends. Likewise, well-connected websites are more likely to be visited than others. Thus, the very structure of the network—who is connected to whom—partially determines how this network evolves, in such a way that the nodes already rich in



connections, get richer. The consequence of this type of evolution is that the popularity is distributed following a power law, which means that very few nodes are extremely popular while the rest of the nodes have very little popularity.

Such process can cause the advent and maintenance of crowds. For instance, if people prefer to go to a disco where there already are people, then they will crowd in one disco and let the other empty (note that this is different from the restaurant story, where people did not want to be together but did end up doing so deriving information from the presence of others). Likewise, crowds can happen on the internet, when people visit the same webpage at the same time. An illustration of this effect is the crowd of 80 million YouTube users who, on December 7, 2009, chose to watch Britney Spears's video "Womanizer." A key factor of the rush was its appearance as the first recommendation for the YouTube users watching "Toxic," an already popular video. Being already rich of this very valuable link, "Womanizer" gathered more links and references. As with the disco example, there is a process of preferential attachment, where past success determines future success. The analogy between crowds on the internet and crowds in public spaces makes sense because similar principles—features of the network driving the influence of a behavior on others—can lead to both types of "crowds." Interestingly, the evolution of unequal distribution of popularity can be boosted or moderated by hugely popular nodes, which regulate access to other nodes. The best illustration of this fact is search engines: insofar as answers to queries are ordered list of websites, which is determined by popularity (this is what Google's algorithm PageRank does), it will boost the rich-get-richer effect of networks. On the other hand, the rich-get-richer effect is moderated by the role given to keywords and by the personalization of results implemented by search engines: these processes promote websites that might not be so popular but which respond to specific interests.

The management of crowd during mass gathering, and the prevention of crushing deaths during evacuation is a problem that city and building architect have to face. Indeed, dramatic events can be avoided with good egress design. A historical example is the Italian Hall disaster of 1913 (described in Tubbs and Meachan 2007): the evacuation of partygoers directed to inward-swinging doors, which could not be opened due to the physical pressures exercised by the evacuating occupants. The crowd formed making it impossible to open the door and causing the death of seventy-two people by crushing and suffocation. This provide dramatic examples of the role of the environment on crowd formation, which are now studied with several tools, including models about how crowd are most likely to behave given external constraints such as fire escape route.

#### 1.4 Diversity of Explanatory Tools and the Integration of Theories

The above illustrations show that diverse methods, theoretical resources, and conceptual tools can be fruitfully used for explaining crowd formations. In general, social scientists benefit from using a rich toolkit of explanatory techniques. This is





because social phenomena, including crowd formation, arise from diverse causes, ecological or psychological, related to motivations or to other cognitive processes. Thus, a different selection of tools will be appropriate for identifying the role of different causes of social phenomena.

#### 1.4.1 Fields in the Social Sciences as Explanatory Toolkits

In some mythical academic world, each discipline corresponds to a well-specified domain of study, which is best explained on the basis of a unified theory and investigated with some dedicated methods. In that world, all studies happen within a paradigm. The above examples—explanations of crowds—show that the social sciences do not resemble this mythical world. A first difference with the mythical academic world is that there is rarely any agreement about how to define the domain of investigation. Crowds, for instance, might seem to form a rather well-defined social kind. They are the subject of many books and papers and are being modeled with computer simulation. Yet, there is no necessary and sufficient condition for a social phenomenon to qualify as a crowd. The archetypical crowd is a gathering of a large number of people at the same location and at the same time. But the sorites paradox applies when looking for specific criteria: how many people does it take to make a crowd? Also, people packed in a place do not make an archetypical crowd if they do not influence each other's behaviors. Conversely, the folk notion of crowd can be extended to cases where people are not physically next to each other but influence each other at a very rapid rate: that is the case of the crowding on the internet mentioned above.

The problem of circumscribing domains is pervasive in the social sciences. Social and cultural anthropologists, for instance, disagree on the very notion of culture (Boyer 2014) and other key notions (e.g., religion). This is not a weakness of the social sciences compared to the “natural sciences”: notions that supposedly identify fields in natural sciences, such as genes and life, are also hotly debated. Most scientific fields do not carve the world at its joints. Still, social scientists do specialize. The specialization is, however, more a question of focus on different aspects of the same phenomena than the study of different phenomena that would presumably belong to different domains. Most importantly, social scientists differ from field to field in that they have at their disposal different explanatory tools. During training and practice, they come to master methodologies and theories, which they diligently put to work for explanation. Thus, fields are not defined in terms of a domain of explananda, but rather through means of explaining and type of explanantia. This raises an important challenge: checking that for a given explanandum, social scientists do not provide incompatible explanations. This does not imply unifying the social science in the sense specified in the first section, but it does imply some interdisciplinary work.

When explaining crowds, social scientists are, thanks to a sufficiently rich explanatory toolkit, able to identify a set of diverse factors that will influence the causal processes that lead to crowd phenomena. The tools put to work for explaining that we mentioned above include the cognitive studies of transmission and imitation, the study of motivated behaviors and how they aggregate, with rational choice theory, and the description of infrastructure for transmission—network science. Each explanatory





tool provides a means to identify causes of crowd formation and maintenance and describe their specific effects. Each explanatory tool provides elements of explanation that are not necessarily incompatible with the other explanations. The fact is that crowds result from the conjunction of multiple causes.

Network science is an explanatory tool for identifying ecological factors of crowd formation: they allow the description of structural elements that will direct the distribution of information. But, of course, the content of the distributed information will make a difference. To what extent, for instance, is it a coordinating information? Answering this question might require the tools of rational choice theory (including game theoretical notions such as the Schelling point). Likewise, the rich-get-richer structural process might need to be complemented with other factors to explain why one rather than the other item or node became hugely popular. Bianconi and Barabási 2001 have talked about cultural fitness or a node's fitness, which is "its ability to compete for links at the expense of other nodes". Invoking cultural or node's fitness itself does not provide a causal explanation, but it calls our attention to what needs to be further explained: the residue that is not predicted by structural aspects of the network. These further factors are mainly psychological factors. These might involve different types of preferences and motivations, as specified in subsection 1.3.2. or this might involve psychological mechanisms of transmission, as specified in subsection 1.3.1. Thus, combinations of the tools for analyzing the diversity of causal factors will be called for in the study of plausible causal mechanisms and for identifying their causal role in each particular case.



#### 1.4.2 Integration and Pluralism

As the case studies described above show, there is a plurality of methods and explanatory strategies that can be relied upon to understand the different aspects of crowd phenomena. One way to react to such plurality is to take it as a defect of a field which needs to be fixed. This was the goal set by advocates of the unity of science that we mentioned in the introduction. We saw, however, that the disunity does not arise from a lack of understanding of the relations between well-defined domains. Rather, it arises from the multiple means for investigating different causal factors. The causal roles of the factors are best explained with psychology, rational choice theory, network science, and so on. In the face of a plurality of causal factors contributing to a phenomenon, and with factors that are best studied by different approaches, we seem to be left with scattered and possibly incompatible explanations. One could be tempted to stop here: acknowledge the diversity and disunity of the social sciences and resign to their apparent incommensurability as an inevitable outcome of the social world. In contrast, an integrative stance approaches explanatory plurality in the social sciences as raising questions of compatibility and interactions: the goal, then, is not unity and reduction, but the search for more integration, enabling interdisciplinary research.

The integrative stance is an epistemic *attitude* that involves investigating how the plurality of causal factors interact and differentially contribute to some phenomenon. The integrative stance involves allowing multiple apparently incompatible perspectives to cohabit, interact, and enrich one another by offering tools to study different aspects



of a same phenomenon. We advocate adopting the integrative stance because it is a way to pursue three epistemic values: consistency, consilience, and complementarity.

*Consistency* refers to the fact that two different approaches to a same phenomenon are not contradicting one another.

Two approaches are *consilient* when they can identify, and agree on, the role of the causal factors that each of them study. For instance, in the Braess's paradox, the psychological factor is the willingness to shorten as much as possible one's commuting time. The ecological factor is the size of the road, determining how many cars can go at what speed. These two approaches, one analyzing the psychology of drivers and the other the flow of cars, are consilient because one can identify the causal role of each factor in forming traffic jams. Consilience consequently implies that there exists a set of terms common to the consilient approaches and describing the explanandum. In the Braess's paradox, for instance, both approaches agree on one way to describe the explanandum, namely, the time it takes to commute. Note that consilience does not imply commensurability in the classical use of the term: there does not need to be a single overarching theory, a unifying language or common criteria for assessing the scientific validity of an explanation. The diverse explanantia, which identify psychological or ecological causal factors, need not rely on common terms and measures. The commensurability is local: just at the points where the approaches can fruitfully interact and be combined.

Finally, an integrative pluralism celebrates the division of scientific labor so long as *complementarity* is pursued. Complementarity means that what serves as a black box for one approach is an explanandum for another. As each approach focuses on specific causal factors and using special methods devised to understand the causal roles of these factors in bringing about some phenomenon, it is inevitable that other aspects of the phenomenon are either ignored or simplified. However, by dividing the study of the causal factors of some phenomenon, the blind spots of one approach can productively be complemented by the tools of another, thus leading to more comprehensive explanations of the phenomenon. For instance, Barabasi analyzes the causal factors leading to success or popularity that are in the network, but he identifies one variable that network science cannot explain. This variable is black boxed under the term "cultural fitness." A successful complementarity approach would have another approach—a psychological one in that case—taking over and specifying the causes of cultural fitness. What is likely to happen, however, is that the approach called in specifies what it is that they can and cannot explain. Thus, a preliminary work improving consilience might be needed to achieve complementarity.

Adopting an integrative stance does not imply a reductionist perspective where one approach would have to be modified in order to become coherent with the other (e.g., making the social sciences coherent with the natural sciences, which suggests a directionality in the coherence assessment). Instead, an integrative attitude aims at developing better interfaces between the different approaches in order to allow their mutual enrichment and a co-development of their respective research methodologies. Note that we are not describing principles of the scientific method aimed to ground the reliability of science. We are more modestly emphasizing the epistemic value of consistency, consilience, and complementarity and drawing consequences on

interdisciplinarity. Likewise, Popper's falsificationism is better understood as an attitude of scientists toward possible refutations, rather than as a principled characterization of "the scientific method" or an order to abandon theories in view of data incompatible with the theories' predictions. Adopting an integrative stance is thus to open the investigation of a particular phenomenon to the possibility that its constitutive elements and causes may be better understood by interdisciplinary efforts. This does not mean that interdisciplinarity should be pursued at all cost. Integration is worth pursuing when and because a richer understanding of a phenomenon benefits from conciliating different approaches together.

Here are examples of the problem of integration involved in the studies of crowd.

- First example, sociological studies of crowd, especially early ones, have often attributed ideas and emotions to the crowd itself. However fruitful this metaphor might be, it prevents consilience with psychology. One field is using the term in one sense, and the other is using the term with another sense. Consilience can be improved by either avoiding the attribution of mental states to sets of people, or by redefining the concepts of ideas and emotions, to the satisfaction of both sociologists of crowds and psychologists. So far, it seems that the best option is the former rather than the latter. In this case, the effort for consilience has to be done by sociologists. Yet, the other option might also be fruitful: for instance, Chalmers and Clark (1998) have been advocating a notion of cognition that is not limited to the bounds of the skull. Memory for instance, could be ascribed to a system that include both a human agent and his notebook containing some relevant information. In that case, the effort for consilience has to be done by both cognitive scientists and sociologists.
- Second example: Economists, including behavioral economists, have been keen to develop models that rigorously describe the observed behavior and have some predictive value—this is rational choice theory. The models can be interpreted in at least two ways. In one interpretation, the models are precise mathematical redescription of observed patterns of behaviors. In another interpretation, the models describe some psychological processes. Thus, an essential variable of models in rational choice theory refer to individual preferences, which is quantified in terms of "utility." The variable can be used either to describe behavioral data assuming that agents are rational or to make empirical claims about the actual motives that cause people to make the choices they do. Both usages are consistent with psychology, which can either develop independent theories of motivation or theories that are compatible with, and building upon, findings in experimental and behavioral economics. The interpretation of preferences as psychological facts might be the solution for making economics consilient with current cognitive psychology. Since the 1970s the field of behavioral economics has worked on the consilience between economics and psychology. This effort was celebrated with the prize in economic sciences in the memory of Alfred Nobel delivered to Kahneman and Smith in 2002. In our example of the crowd gathering at Tahrir Square, we do really want to talk about underlying motives as having a causal role in crowd formation.



- Third example: The network science analyses of popularity explicitly state that they identify one factor in the growth of popularity and the consequent distribution. Features of the sociocultural phenomena that cannot be explained with the structure of the network are residual and in need of some other type of explanation. In this way, network science is striving for compatibility with other scientific approaches. But there remains more work to be done for consilience: we want to know how the ecological factors related to the network interact with the psychological factors. For instance, why and when are people led to use and trust the results of search engines?

### 1.5 Naturalism as an Integrative Stance

The integration advocated above has focused on integration among fields in the social sciences. However, the integrative stance can be applied to fields coming from both the social and natural sciences. As a case of integration in the natural science, Mitchell (2002) documents explanations of the division of labor in social insects. She shows how different approaches—such as evolutionary theory, behavioral genetics, behavioral ecology, and animal learning—are not understood as competitive explanations but can be integrated together to explain both the patterns of division of labor together with their plasticity and apparent self-organization. Closer to the social sciences is the case of archaeology and explanations of site formation, which often involves articulating theories and methods from anthropology, geology, taphonomy, nuclear chemistry, osteology, and many more (Renfrew and Bahn 2008).

We think of naturalism in the social science as the stance of valuing consilience between the social and the natural sciences. It is thus an integrative stance, but one that goes against the historical divide between the social and natural sciences. Naturalism is therefore different from reductionism. For instance, neuro-economics, insofar as it aims to explain economic behavior with the sole means of brain science, is a reductionist project. But it is not consilient with psychology. It bypasses it and thus loses the ability to describe how multiple causes such as beliefs, evolved and learned skills, individual history, motivation, and so on might interact for producing a given behavior. Reductionist projects run the risk of making oversimplification because social phenomena are likely to result from multiple causes of different types. Naturalistic projects, not so much.

Naturalism does not consist either in mimicking or drawing on the methods of natural science. For instance, theories of cultural evolution have made an analogy between the processes of biological evolution and cultural changes (Mesoudi, Whiten, and Laland 2006). This motivated some authors to draw on the models of biological evolution (Boyd and Richerson 1985). The analogy might be justified and fruitful, but it does not make the project a naturalistic one. It does not make biological and cultural theories consilient because it does not matter to theories of evolutionary biology that their models might work for explaining culture and, reciprocally, it does not matter to theories of culture that the model they use comes from evolutionary biology or from elsewhere.



Dan Sperber (1996) is explicitly aiming at developing a naturalistic approach in the social science. He presents a framework theory that allows distributing questions across several fields: to psychology, as a most relevant field, but also to any other relevant field able to describe the causes of cultural phenomena. For instance, the chemistry of chert explains its hardness and brittleness, which in turn explains aspects of the production of arrowheads in the Neolithic (Charbonneau 2015). Likewise, crowd formation often results from both intentions, such as the intention to escape, and nonpsychological factors, such as inward rather than outward swinging doors—as illustrated by the Italian Hall disaster. Sperber has especially worked on ways to make cultural anthropology consilient with cognitive psychology. For this, he specified how and when mental representations are causally involved in social and cultural phenomena. He then points out the work that the cognitive revolution and evolutionary psychology have done for making psychology consilient with the natural sciences—investigating, respectively, the material implementation of cognitive processes and the biological evolution of cognitive capacities.

## 1.6 Conclusion

Following the failure of the unificationist program of the logical positivists and of the reductionist approach, it seems that the social sciences are to remain divided and their different approaches and disciplines insulated. In this chapter, we have argued in favor of an integrative pluralistic stance, where the specificity of the different approaches in the social sciences is celebrated, but where interdisciplinary cohesion and cooperation are strived for. Indeed, the best ways to promote integration and naturalism as we characterized them in this chapter is to focus on causal explanations. Since social phenomena result from multiple causes, the best explanations will make use of the relevant explanatory tools of the fields and disciplines, whether they come from the social or natural sciences.

The integrative pluralism developed here is based on the toolbox metaphor: since social phenomena result from many different causal factors, it is worth having a set of explanatory tools that best afford the production of satisfactory explanations. In our illustrations, we mentioned the following causal factor of crowd formation and maintenance: the psychology of crowd behavior such as the transmission of emotions, incentives for making the choices that lead to crowding, the network, and a multitude of ecological factors. For each of these causal factors, one approach was best endowed for analyzing its role in producing the crowd phenomenon. Our approach to pluralism is a pragmatic one: there exist a set of explanatory tools, let the scientists use the ones that better fit their specific explanatory purposes.

Integrative pluralism promotes an active cooperation and co-development of theories and methodological approaches between the different social sciences. In this, it is different from the many competition-centered approaches of theory-choice that view the coexistence of different theories and methods explaining a same phenomenon as the grounds for the falsification (e.g., Popper), elimination (e.g., Paul Churchland), and/or simply abandonment (e.g., Kuhn) of the “weaker” ones. An integrative

pluralism is also distinct from an epistemic anarchism that aims to normatively impose a plurality of scientific approaches in order to stimulate scientific progress (Feyerabend 1975; Chang 2002). Nor, in fact, does it entail that different approaches are inevitably incommensurable, as staunch relativists would have it. Instead, we acknowledge the existence of different explanatory frameworks and argue that interdisciplinary dialogue can obtain when the identification of the causal factors underlying a phenomenon serves as a common epistemic goal. Finally, our defense of pluralism does not rest on a rejection of the metaphysical assumption of monism—that is, that the world is itself one, united thing—nor does it entail that we need to grant reality to various types of entities (Dupré's 1993; "promiscuous realism"). Rather, we argue for an *epistemic* pluralism, the benefit of which is cashed in terms of a complementarity between approaches leading to a more comprehensive understanding of some phenomenon.

Our view of pluralism is in line with Peter Galison's view on scientific disunity and pluralism in the physical sciences. In his *Image and Logic*, Galison (1997) argues for a pluralistic view of physics, showing how theoreticians, experimentalists, and instrument-makers often have very different problems, methods, and languages when working on some common project. However, this plurality becomes productive as the different traditions develop what Galison terms "trading zones," that is, a minimal language that allows the different traditions to exchange and jointly solve problems. The languages so developed are not universal and englobing, the different approaches are not unified, but the benefits of interdisciplinarity are achieved by establishing a common epistemic space of interaction between the traditions. Similarly, we argue that the integration of multiple approaches should rely on three epistemic values, that of consistence, consilience, and complementarity. Instead of striving for a unified theory that would englobe the different methods and theories of the social sciences, aiming toward these epistemic values has the benefit to offer a more comprehensive understanding of the contributions of the different causal factors producing a phenomenon under study.

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# Commentary: Plurality and Pluralisms for the Social Sciences

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Heintz, Charbonneau, and Fogelman present plurality as a hallmark of the social sciences. Taking investigations on crowd formation and dissipation as relevant case studies, they argue for methodological pluralism, claiming that an integrative stance encompassing a range of different approaches is the best strategy to address the multiplicity of causes and varied aspects of social phenomena. Pluralistic views have met with growing consent in recent philosophy of science, largely concomitant with an increasing interest in the special sciences, their specific methodologies and conceptual tools, and in scientific practice. By highlighting a few differences in possible ways of being pluralists, this contribution aims to provide some epistemological tools to further detail the authors' discourse on pluralism, and to question if it can qualify as a permanent stance for the social sciences.

## 1. Plurality and Pluralism

Philosophical reflections on pluralism have given rise to myriad views in the last few decades, touching upon a whole range of—largely interrelated—issues from scientific theories to causation, explanation, and evidence. Some of these views have tackled science and scientific method as such, while others have addressed specific disciplinary fields and the special issues they face.

While both “plurality” and “pluralism” are the leitmotifs of much current philosophical work on the scientific enterprise, they must not be confused. Pluralist positions stem from the acknowledgement of a plurality of elements related to the construction of scientific knowledge in a given domain, but they do not coincide with it. Many scientific fields—some would argue all of them—display a plurality of methodologies, explanatory accounts, theories, and conceptual tools. Disciplines can exhibit plurality at different stages of their development in time, or when dealing with different sorts of phenomena, or different aspects of the same phenomena, or when pursuing different research programs, when having different epistemic aims, or when different groups of researchers are at work. The elaboration of *pluralistic* positions has

specifically to do with philosophical considerations over the implications that such *pluralities* might have with respect to our expectations on the goals science should have, over whether or not science must aim at a single method, at universal laws, single explanatory and predictive procedures, and general shared concepts. Pluralism has to do with our orientations and commitments on scientific discourse and the forms of plurality it might exhibit.

Acknowledgment of the variety of natural phenomena and their features, for example, of complexity in the biological world (see Mitchell 2003), has been accompanied by claims on separateness and disunity in nature (see Dupré 1993; Cartwright 1994, 1999). Without entering into metaphysical issues, I will focus here on epistemological problems and discuss different ways of tackling plurality from pluralistic standpoints, in line with the methodological concerns expressed by Heintz, Charbonneau, and Fogelman (henceforth HCF). Once the distinction between plurality and pluralism has been clarified, we shall reflect on how pluralism can be defined, what it exactly amounts to, and what basic ideas most pluralists would generally agree upon. What all “pluralisms” seem to share is not just the acknowledgment of a range of different possible epistemic tools but an *explicit endorsement* of the multiplicity of perspectives, notions, and methodological approaches. Not only is there a plurality of methods and theories in scientific research and practice, but this is an added value, and should be strongly preferred over monistic attempts to reduce, neglect, or overcome plurality.

Pluralism implies some positive evaluation of present plurality. It will not take some single view to be clearly the best in all respects, and it will not condemn all those not conforming to some established “orthodoxy” as somehow inferior. The next section examines how different views on what pluralism amounts to can take different stances with respect to not only how scientific research is currently pursued but also how it should be pursued, and ultimately with respect to the very “fate of [scientific] knowledge” (Longino 2002).

## 2. Varieties of Philosophical Pluralism

Without aspiring to provide an exhaustive list of the perspectives available in the current philosophical debate, I will present some of the leading and most successful views on pluralism, outlining their characterizing features and general implications.<sup>1</sup>

Among the most prominent pluralist positions, Sandra Mitchell’s *integrative pluralism* (Mitchell 2002, 2003) emphasizes explanatory issues and possible complementarity among different approaches. Previous works by Mitchell (Mitchell 1992; Mitchell et al. 1997) distinguish between *competitive* and *compatible pluralism*. The competitive approach takes the competition between different theories or research programs as the best strategy to test them severely and thereby enhance scientific progress. It helps scientific communities face problems related to theory choice given available evidence and the fact that currently accepted theories might not be those deserving the highest epistemic trust in the future in light of further evidence (see Kitcher 1990). Competitive pluralism can be seen as strategic, and merely temporary, to be employed as a means to achieve the acceptance of a single true theory in the



long run. Compatible pluralism, on the other hand, sees alternatives as not mutually exclusive, and has been widely recognized—especially in the biological sciences—with respect to different explanatory accounts and different levels of analysis. While grasping some real features of biology, this approach might fail to entertain a crucial insight of pluralism, namely the role of various alternatives in tackling *one and the same* feature of a given phenomenon. In the end, it might isolate single levels of analysis, neglecting the wealth of mutually interacting processes and separating disciplinary fields and research groups. In other words, compatible pluralism runs the risk of turning into *isolationist pluralism*.

As a way to overcome the ambiguities of pluralistic standpoints and to analyze how various models of the same phenomenon are related, Mitchell puts forward *integrative pluralism* to distinguish between theoretical modeling and the application of models to specific complex phenomena. “At the theoretical level pluralism is sanctioned,” while “at the concrete explanatory level . . . integration is required,” since “however many contributing causes participated, there is only one causal history that, in fact, has generated a phenomenon to be explained” (Mitchell 2002: 66). Pluralism will continue to hold in modeling potential contributing causes, but not in the application of such models in specific explanations, where they must be integrated: “pluralism with respect to models can and should coexist with integration in the generation of explanations of complex and varied biological phenomena” (68). In between integrative and isolationist pluralism, *interactive pluralism* has been advocated, which claims that “satisfactory explanations can also be obtained without integration of multiple levels” and, while not establishing an integration imperative, “does not discourage interaction as, in some instances, interaction and integration do lead to better explanations” (van Bouwel 2014: 109).

Pluralism can be taken as an overall attitude to science as such, how it should be pursued and what we can expect from it, but—as has just emerged—it also addresses more specific issues, such as explanation and causation. *Explanatory pluralism* argues for the rejection of a winner-takes-all view, in favor of the employment of different explanatory approaches, taking different features of the explananda and different relations holding among them as explanatorily relevant.<sup>2</sup> Different explanatory accounts may be adopted according to the specific kind of phenomenon we are dealing with, the features of the phenomenon or the levels of organization we are tackling, the researcher’s background knowledge and that of those to whom the explanation is to be conveyed, the final purpose of the explanation, and our further epistemic aims. For explanatory pluralism to be genuine, we always have to make sure that the competing explanatory accounts are actually addressing the same object and the same explanatory question. Otherwise, available explanations will not be genuinely different explanations of the same explanandum, and the plurality of explanations will not be much of an issue. *Causal pluralism* has, in turn, been presented in various guises. Generally speaking, it argues that there is no such thing as *the* causal relation: when talking about causation, we deal with different kinds of relations in different systems and/or different concepts and theories to capture them. Causation can be conceived in terms of, for example, productive, difference-making, and probability-raising relations and can be analyzed by mechanistic, manipulative, and counterfactual theories. Causal



pluralism can be advanced into ontological, conceptual, and epistemological versions and questions, among others, whether causal discourse can be tackled in the same terms across different fields.<sup>3</sup>

Is pluralism here to stay? This is one of the crucial questions to address when discussing different forms of pluralism: does pluralism have to do with some provisional feature of our construction of knowledge, to be eventually overcome by changes in, for example, methodological, experimental, and conceptual tools, or does it stand as a permanent perspective whose fate will persist over time? Different answers are provided. The so-called *moderate pluralism* implies a temporary copresence of alternative theories aimed at achieving some form of unity in the long run. Other views stress how pluralism seems to persist in disciplines that have significantly progressed, as a symptom not of the allegedly immature character of investigations, but rather of the complexity of the systems under enquiry and of the interfield work addressing them. Hasok Chang advocates pluralism as a permanent feature of scientific endeavour we should all, normatively, strive for. His *active normative epistemic pluralism* claims that different approaches must be enhanced insofar as they address different epistemic aims (e.g., describing, explaining, predicting, measuring, classifying, etc.) and satisfy different—sometimes divergent—epistemic values (e.g., simplicity and completeness). Pluralism offers twofold benefits: toleration amounts to “insurance against unpredictability, compensation for the limitations of each system, and multiple satisfaction of any given aim,” while interaction includes “the integration of different systems for specific purposes, the co-optation of beneficial elements across systems, and the productive competition between systems” (Chang 2012: 253). Chang stresses how pluralistic science does *not* abdicate its freedom and responsibility to interpret and evaluate scientific work, dissipate resources, admit of *any* simultaneous contribution whatsoever, and end up in relativism.<sup>4</sup> It is not the pursuit of some “anything goes” kind of trend, but the commitment to promote a motivated and justified “many things can go” attitude.

Pluralism is also related to the social nature of scientific investigations. Longino (2002) has stressed how researchers working, for example, in the biological sciences, present a wide array of different expertise, employ different theories and methodological approaches within open debate, and are subject to critical review, with no primacy of a specific subfield or standpoint over the others. Research being pursued in multiple directions is required to proceed transparently, making use of processes of peer review, and can provide simultaneously independent and/or interconnected views in a multidisciplinary context. Scientific communities benefit from entertaining numerous perspectives to investigate phenomenal intricacy, and the social nature of scientific activity is held to further support epistemological pluralism. Epistemological reflections thus bring with them considerations on the relations between science and politics—more specifically between democratic societies and the construction of pluralistic knowledge.<sup>5</sup>

### 3. Crowd Formation and Methodological Pluralism

Let us now turn to the case study discussed by HCF and to their epistemological concerns. HCF’s discourse starts off with the recognition that the social sciences



are characterized by “a plurality of theoretical approaches, methodological tools, and explanatory strategies,” and that “different fields rely on different methods and explanatory tools even when they study the same phenomena” (HCF: 1). Pluralism is introduced because “the plurality of causes of social phenomena invite for a diversity of methodological and theoretical tools” (HCF: 1). Different toolkits are needed in order to grasp the multiplicity of causal factors bringing about social phenomena, and pluralism is given a disciplinary flavour, showing how crowd phenomena are investigated by psychology, rational choice theory, and network theory—which are claimed to provide complementary explanatory accounts.

Crowds are presented as the objects of quite distant investigations. Psychology and cognitive science study them in terms of “contagion” of ideas, behavioral inclinations, emotions, and the herd instinct, responsible for making people gather in large groups, as when marching or chanting together. Rational choice theory, on the other hand, focuses on unintended and intended crowd formation and explains it on the basis of information cascade, where the crowd is the unintended consequence of what people take to be the best choice for themselves—for example, crowd forming in a restaurant, while the one next door remains empty—or the intended consequence of motivated behaviors that aggregate starting from a first salient event—for example, crowds forming for revolutionary purposes, as during the Arab Spring. Yet another view is provided by network science, which aims to model connections among people accounting for the distribution of coordinating information and the maintenance of virtual crowds, analyzing infrastructure for transmission (e.g., the distribution of website popularity).

To evaluate the meaning and role of pluralism as a theoretical option, we shall first of all establish what exactly we are being pluralists about. In discussing crowd formation and maintenance, do the different accounts actually address *the same* phenomena? Do psychology, rational choice theory, and network theory tackle *the same explanandum*? Are we identifying different causes of the same phenomenon, due to different standpoints or different epistemic aims, or are we considering different phenomena altogether, and providing answers to different why-questions? A careful elaboration of a fruitful pluralist approach preliminarily means drawing the boundaries within which our pluralistic perspective is put to work. We shall hence make clear, for instance, to what extent such phenomena as intended and unintended crowds, marching and sitting in a restaurant, promoting a revolution or a website can be taken as the same object of investigation on which alternative accounts are provided.

Once we establish exactly which object pluralism is targeting, we need to consider in which sense it can count as explanatory pluralism. According to HCF, “social scientists benefit from using a rich *toolkit of explanatory techniques*. This is because social phenomena, including crowd formation, arise from *diverse causes*, ecological or psychological, related to *motivations* or to other *cognitive processes*. Thus, a different selection of tools will be appropriate for identifying the role of different causes of social phenomena” (HCF: 7, italics added). As already stressed, multiple possible causes are per se neither necessary nor sufficient to force pluralism and to abandon the search for some unique overarching explanatory account. Pluralism is selected here as the most fruitful option to do justice to a variety of elements, which, while related, should not



be conflated. What we are presented with is a wide field of investigation—the social sciences—with a plurality of explanatory methodologies, dealing with different kinds of causes, in the light of various motivations and epistemic interests. Accordingly, explanatory pluralism can be understood as having multiple facets. It might regard which different core *relations* are to be taken as explanatory, whether, for example, causal, unificationist, functional, or other, and, if causal, which relation is deemed to be at play (e.g., mechanistic or manipulative-counterfactual). If it is the diverse causes we are focusing on, pluralism will be dealing not only or primarily with explanatory relations but also with different kinds of *relata*. Moreover, HCF acknowledge an important role played by motivations and final *epistemic aims*, that is, the reasons we are looking for an explanation and what in the end we will use the explanatory content for. What is worth stressing is that explanatory pluralism itself has to do not just with the plurality of causes and current variety of methods devised to tackle them, but with the very idea of what “explaining” amounts to. It can involve the *relata* of the explanatory relation and the ways to identify them, the very nature of the explanatory relation, the purpose for which the explanation is sought, and the epistemic values by which the adequacy of the explanation will be evaluated.

#### 4. On the Integrative Stance: From Plurality to Pluralism, and Back

HCF take pluralism to have a specific epistemic purpose, advocating an “integrative stance” to improve compatibility and consilience among fields, and to foster interdisciplinarity. To fully understand HCF’s position, we shall ask whether this is a provisional proposal, or whether embracing a whole range of separate and distinctive methods is conceived as a permanent approach. How can integrative pluralism be implemented? Can it eventually be resolved, with some unitary picture to emerge in the long run, or is pluralism here to stay?

HCF do not defend just tolerant pluralism, that is, mutual respect and the coexistence of different approaches, or interactive pluralism, where different views are encouraged to cross-fertilize the soil, but *integrative* pluralism, which asks for some *joint* bloom to blossom out. Integration, it is argued, “involves allowing multiple apparently incompatible perspectives to cohabit, interact, and enrich one another by offering tools to study different aspects of a same phenomenon” (HCF: 9). The integrative stance is specifically advocated to pursue three epistemic values: consistency, consilience, and complementarity. Consistency has to do with the different approaches not contradicting each other; consilience with the role of the causal factors they study—with just local commensurability; complementarity with the division of scientific labour, with each field of expertise focusing on a few factors, simplifying or bracketing the others; and then all covering each other’s blind spots.

With respect to crowd formation, HCF recommend interdisciplinary integration between disciplines belonging in principle to both the social and the natural sciences, to make the most out of the different causal explanatory approaches developed within



different fields. They advocate an integrative pluralistic stance to ensure interdisciplinary cohesion and cooperation by focusing on causal explanations. Different explanatory tools are adopted for the integration of theories in order to avoid epistemic anarchism, staunch relativism, or strong incommensurability, and to favour “a *complementarity* between approaches leading to a *more comprehensive understanding* of some phenomenon” (HCF: 12, italics added). While coherence and consilience seem less problematic, I believe integration through complementarity merits further reflection and constitutes a critical aspect to fully grasp the whole perspective HCF suggest.

In the first place, we shall make clear on which features explanatory integration shall focus. For integration to be fruitful, we should start by positing some common language and conceptual toolbox between the fields of enquiry involved, to allow a shared terrain of communication and exchange. Building on that, some insights should be provided regarding the level of description of the exact object of the purported integration. It should be specified whether we are supposed to integrate explanations of some “archetypical crowd,” like the simultaneous gathering of a very large number of people at the same (real or virtual) location, in very general terms, or some more specific phenomenon, like virtual crowding on the internet or, rather, people converging in a square for political reasons, or, even more specifically, some instantiation of a crowd, for example, during the Arab Spring in Egypt. Is explanatory integration to be pursued in accounts at the type or token level? HCF state: “combination of the tools for analyzing the diversity of causal factors will be called for in the study of plausible causal mechanisms and for identifying their causal role in each particular case” (8). For integration—and not just compatibility—of causal explanations and mechanistic accounts to take place, the boundaries of the target system and the graininess of the analysis must be very carefully specified.

Second, should we believe that integration would necessarily and always lead to better explanations? How can we be sure it will always yield the most adequate answer to a given question? As highlighted, motivations and final epistemic purposes affect the choice of a given explanatory account as the most adequate in a given context. Furthermore, for integration to be pursued, explanatory models must be commensurable, which might not always be the case. Thus, while it is worth testing compatibility between different explanations to see whether fruitful *interactions* between them can be performed, that *integration* will always be possible and always constitute the preferred strategy to fit specific explanatory purposes is debatable, and cannot just be assumed as an uncontroversial starting point.

Third, how can we combine the idea that we are not striving for a single unified theory, yet at the same time argue for an epistemic pluralism the benefit of which is given by a complementarity between approaches leading to a *more comprehensive understanding* of the phenomenon at stake? What would a “more comprehensive understanding” consist in, and with respect to which aims should it be measured? Would a more comprehensive understanding of crowd formation and dissipation be, for instance, more inclusive, or more detailed, or carry higher predictive power? And should we then take integration to be progressively pursued toward some sort of “*most comprehensive understanding*”? Both the second and third points raised here seem to suggest that an interactive pluralism should rather be preferred over an integrative one



if the variety of approaches in the social sciences and their genuinely specific features are to be both respected and cultivated—if, so to speak, after going from plurality to pluralism, we want to endorse pluralism in order to preserve the richness of plurality.

Concluding, I'd like to stress that HCF's proposal includes different suggestions that might elicit different reactions. The advocacy of different methods and kinds of explanations to study different aspects of the same phenomena, the claim that different explanations can be compatible, and the plea for interdisciplinary work all seem straightforward and agreeable. Whether they also, and necessarily, commit us to integration, and how that shall be achieved merit, instead, a qualified reading and might need further reflection. The challenge HCF must meet is how to have not only interaction, but integration, while bearing in mind that "the degrees of integration, like the degrees of accuracy and simplicity, will be a function both of what is possible and of the purposes to which we intend to put the knowledge" (Longino 2005: 193), with no guarantee that integration can be achieved, and no expression of faith to be made in that respect. Given the reasons that motivate it, pluralism must be promoted as a way to enhance plurality and its role, over and above any specific, "winning" position related to a single epistemic aim, even were it integrative.

## Notes

- 1 For possible taxonomies of pluralism, see, for example, Kellert, Longino, and Waters (2006); Mitchell (2009); and van Bouwel (2014).
- 2 Explanatory pluralism has also been addressed with a specific focus on the social sciences (Little 1991; van Bouwel 2004; van Bouwel and Weber 2008), and with disciplines at the crossroads of the natural and the social sciences, such as psychiatry (see Kendler 2008; Campaner 2014).
- 3 See, for example Cartwright (2004), Campaner and Galavotti (2007), Godfrey-Smith (2009), and Psillos (2009).
- 4 Let us stress that relativism, in turn, does not per se imply pluralism: relativism demands that *actually existing* alternatives are all treated on a par, but does not commit to any requirement that a multiplicity of alternatives *should be* in place.
- 5 See also Longino (1990) and Kitcher (2001).

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