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Is Multiple Realizability a Valid Argument against Methodological Individualism?

[ABSTRACT] In recent decades a number of authors have relied on the multiple realizability argument in order to reject methodological individualism. In this paper I argue that this strategy results in serious difficulties and makes it impossible to identify social entities and phenomena. [ABSTRACT ENDS]

Keywords: multiple realizability, methodological individualism, methodological holism, Harold Kincaid, Keith Sawyer.

The multiple realizability argument originates from philosophical debates about the reducibility of psychology to neurology. It was first formulated in an influential paper by Jerry Fodor in 1974. (Fodor 1974) Since then, some authors (Kincaid 1986 and 1997; Sawyer 2002, 2003 and 2005; also Currie 1984, 252) have attempted to use it in the philosophy of the social sciences in order oppose methodological individualism. Even authors sympathetic to methodological individualism have been inclined to accept the argument as valid. (Jones 1996) In this paper I argue that the argument is not valid within the social sciences (although it may be valid when describing relationships between phenomena in other disciplines). If it were valid, it would produce serious difficulties for the possibility of the study of social phenomena in general.

1.

The history of the multiple realization argument goes back to Hilary Putnam's works from the 1960s. In 1974 Jerry Fodor used multiple realization as an argument against the view that psychology is reducible to neurology. (Fodor 1974) While he accepted that mental states (such as beliefs or pains) are neurological events, Fodor argued that the *laws* of psychology cannot be reduced to the laws of neurology. Pains, for instance, can be realized in many different ways in different nervous systems (octopuses, lizards, humans). It is therefore impossible to convert, in a systematic form, statements about pains into statements about neurological events. Neurology as a discipline does not have the terminology that can jointly cover all the cases of pain in different creatures. The important assumption on which Fodor relied is that disciplines are differentiated by the "natural kinds" they study. The laws of psychology deal with the "natural kinds" that are not coextensive with those of neurology. Consequently, the laws that neurology can formulate cannot be coextensive with the laws of psychology, even though every psychological phenomenon may be a neurological phenomenon. The general terms that neurology operates with do not coincide with the natural kinds that psychology studies and are unlikely to be co-extensional with psychological terms.

The same applies to reduction between many other fields. Consider, for instance, the fact that every monetary transaction is a physical event: it may be the exchange of paper notes, pieces of gold, strings of wampum or an electronic operation. The diversity of the events that may count as monetary transaction is so great that, although they are all physical events, it is impossible to convert the laws of economics that pertain to monetary exchange to physical laws about them. Simply, physics does not have the terms suited to separate those physical events that can be used as monetary transactions from those that cannot.

The two important attempts to use the multiple-realization argument against methodological individualism in the social sciences come from Harold Kincaid and Keith Sawyer. (Kincaid 1986, 1996 and 1997; Keith Sawyer 2002, 2003 and 2005) Methodological individualism is understood as the view that a social theory should be "reducible to individualist theory" (Kincaid 1986, 496) or that "every event that sociology explains can be explained in terms of individuals, and every law in sociology can be explained by laws concerning individuals." (Sawyer 2002, 537) Both Kincaid and Sawyer endorse *ontological* individualism—they do not assume that societies consist of anything else but individuals; as Kincaid puts it, individuals "exhaust" the social world. (Kincaid 1986, 495; Sawyer 2002: 537-539) Similar endorsements of ontological individualism are standard in the philosophy of the social sciences and commonly described as the generally accepted view. (Udehn 2001, 2; Førland 2008, 45; Epstein 2009, 187; List and Spiekerman 2013, 630.)

In what follows I assume that ontological individualism is the common ground shared by both methodological individualists and their opponents. Both Kincaid and Sawyer express strong commitments to ontological individualism.[1] One should bear this in mind because of some arguments that follow.

It is useful to introduce here a small refinement in the formulations of ontological individualism. The social world also includes collective activities (such as sport games) and it is awkward to say that *activities* consist of *physical entities*, such as individual humans. A more suitable formulation of ontological individualism, suggested hundred years ago by Georg Simmel, would be to say that the social world consists of (is exhausted by) human individuals[2] and their *interactions*.[3] (Simmel 1908, 3-5 and Simmel 1917, 6-15.)

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[1] For Kincaid social entities and phenomena are "exhausted by" by individuals in the sense that

> every entity in the social realm is either an individual or a sum of such individuals. Individuals determine the social world in the intuitive sense that once all the relevant facts (expressed in the preferred individualist vocabulary) about individuals are set, then so too are all the facts about social entities, events, etc. (Kincaid 1985, 495.)

Similarly, according to Sawyer (2002, 537):

> **"**Ontological individualism is the stance that only individuals exist; sociological objects and properties are nothing but combinations of the individual participants and their properties."

These assumptions are well-justified. An author who rejects ontological individualism and assumes that social entities and phenomena consist of something more than just individuals and their interactions (or that they do not consist of individuals at all) does not need the multiple realizability argument in order to prove that social phenomena and entities are not reducible to individuals and their interactions. In that case they certainly cannot be reducible because they are conceived to be different from the sums of individuals and their interactions.

[2] "Individuals" is understood to include individuals' properties as well.

Theintroduction of interactions does not expand ontology; pointing out that individuals interact does not mean saying that interactions are a separate kind of entities. Also, interactions themselves can have properties; we can describe *how* people interact. In order to say that "a game of squash was fast-paced" one need not postulate that the game was an entity that had the property of being fast-paced; the phrase can merely mean that the players played in a certain way. All this may seem obvious, but if one attributes to methodological individualism the improbable view that individuals do not interact in social life, or that their interactions do not have properties, then one can easily generate refutations of such methodological individualism—but they merely hit the straw man.[4] Once methodological individualism is construed to preclude interactions between individuals, it becomes pointless to construct more sophisticated arguments against methodological individualism, such as the one based on multiple realizability. Although many authors forget to include interactions in their definitions of ontological individualism it would be an uncharitable interpretation of their position to attribute them the assumption that that individuals do not interact in their social environment. In this article I assume that this is not the case, and that the authors who endorse ontological individualism also endorse the view that individuals interact in their social environments.

The formulation of the multiple realizability argument in both Kincaid and Sawyer is straightforward. Kincaid points out that the same social event, "peer group" or "bureaucracy" can be realized in any number of different relationships between individuals. (Kincaid 1986, 497) Each of these configurations exhausts and determines the events they realize, but because of the diversity of realizations no single type of the configuration of individuals and their interactions corresponds to the predicates of a social theory. Since no individualist description can cover all the realizations covered by a social term, it will be impossible to formulate, using individualist terms, laws about social events or phenomena that have the biconditional form "if … then … ." Individualist terms pertain to specific realizations of social phenomena, so they cannot cover what is covered by social terms. Kincaid states as an example the claim of Marxist sociology "if the French Revolution failed there would be another bourgeois revolution in France." (Kincaid 1986, 501) If we were now to replace "bourgeois revolution" with individualist terminology, he argues, we could only refer to individual events such as the English Revolution or the Dutch Revolution or similar, he says. However, it makes no sense to say "if the French revolution failed there would be the English or the Dutch or … revolution in France".

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[3] As he put it, a society is not a *substance* that could consist of individual physical parts, but an event, a function of mutual interactions between individuals. (Simmel 1917, 14.) See similarly Hodgson 2007. Greve 2012, 210 and Zahle 2003, 85 similarly mention interactions. It would be hard to doubt that Simmel endorsed *ontological* individualism, since he explicitly defined society as a set (*Umkreis*) of individuals that are connected through interactions and consequently seen as a whole. For a different view see Udehn, 2001, 74-76.

[4] An example is Hodgson 2007, 220-221. Hodgson accurately describes as improbable the view that social phenomena could be explained by referring to individuals without taking account their relations (interactions), but then decides that it is unwarranted to use the term "methodological individualism" for the position that takes individuals' interactions into account. Certainly, the terms "methodological structuralism" or "methodological institutionalism," that he recommends are actually better suited for the position that would (as he describes) "reify social structure as something more than an interacting pattern of individuals, which would exist even if the individuals all disappeared." (221)

Sawyer repeats the same argument but also develops its implications further. "The basic idea is that for any social property, there is in principle an endless sequence of nomologically possible individual-level states such that although each of them 'realize' or 'implement' the social property, none of them is coextensive with it." (Sawyer 2002: 547) In other words, "social properties may be irreducible to individual[s'][5] properties, even though social entities consist of nothing more than individuals." (541) Specific ("token") events or institutions can always be described in the terms that pertain to individuals, but this does not apply to the types of social events or institutions. (542) For instance, in his view, the methodological individualist's reduction of "competitive team sport" would have to "involve the disjunction of all past and potential players' individual properties, in every past and potential competitive team sport, in all of the world's cultures." (549) If methodological individualism were true, then for every sociological natural kind predicate there would exist a coextensive set of natural kind predicates pertaining to individuals[6] while generalizations that state this would be laws. (551) However, this cannot be the case because the diversity of elements in individual level disjunction prevents the formulation of such laws.

Sawyer further uses multiple realizability in order to argue that "social properties of events may be causally related to individual[s'][7] properties and social properties of later events and that these causal laws may be irreducible to individual level causal accounts." (Sawyer, 2005, 204) Because of multiple realization, it is possible that (a) a social property lawfully causes individuals' properties although the properties of the individuals that determine the given social property do not lawfully cause these individuals' properties, and (b) a set of individuals' properties I_1 may determine a social property S_1 and a set of individuals' properties I_2 may determine a social property S_2 in such a way that S_1 lawfully causes S_2 although I_1 does not lawfully cause I_2.[8] The emphasis is on the term "lawful": the real causal power still resides in the sets of individuals, but because of the great variety of their combinations, statements about lawful regularities cannot be translated into statements about individuals.

The validity of the multiple realizability argument has been accepted even by the authors who are sympathetic to methodological individualism. Tod Jones thus states that the argument is valid but that the individualists' point has never been that high-level generalizations can be translated into individualist terminology. (Jones, 1996, 124) Rather, "[t]he central claim of individualism has always been one that ran in the other direction: Given all the information about the behavioral dispositions and the contextual environment of each individual involved in some social phenomena, one can come up with an account of any observable social event." (124) Similarly, outside the social sciences, parallel dilemmas about

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[5] Confusingly, Sawyer uses the term "individual properties" (that normally means "single properties") where his text makes it clear that he means "individuals' properties".

[6] Confusingly, Sawyer uses the term "individual natural kind predicates." The phrase could be misunderstood as "predicates belonging to individual natural kinds" in which case his statements would be meaningless.

[7] See note 5.

[8] Or, as Sawyer put it (Sawyer, 2003, 208):

> 1. Social constraint. Social property S at time t1 lawfully causes individual property I* at time t2, even though the supervenience base I at time t1 does not lawfully cause I*.
> 2. Macrosocial laws. Social property S at time t1 lawfully causes social property S* at time t2, even though the supervenience base I at time t1 does not lawfully cause the supervenience base I* at time t2 or social property S* at time t2.

methodological individualism exist in the philosophy of history. Applied in the philosophy of history, the multiple realization argument would make it impossible for methodological individualist historians to formulate historical laws—but since few historians today are interested in Spengler- or Marxist-style historical laws, a methodological individualist historian is likely to agree happily with the conclusion Kincaid and Sawyer want to draw.

2.

The multiple realizability argument, however, harbors wider problems. Consider its implications for the study of social phenomena or entities in general. If the realizations of such phenomena or entities (revolutions, banks) are as widely diverse as it is necessary for the argument to work, then they should have no common properties that they share. The problem in that case would be to say when something is a bank or a revolution. We could not recognize them, because they would have no properties that would enable us to do it. We would not know when we can apply the words "bank" or "revolution" to them. If the realizations of "competitive team sport" were so diverse as Sawyer claims, then we could never say when our generalizations about a competitive team sport pertain to a realization of the phenomenon "competitive team sport," because we would never be able to say whether a phenomenon is a competitive team sport or not. Kincaid similarly claims about group rewarding that "No single, fixed description of what individuals do to bring about 'group rewarding' seems available." (Kincaid 1996, 156) If so, how can we know when some individuals' activities count as "group rewarding" and how do we know whether we should describe them using the phrase "group rewarding"?

The same problem applies to more general terms such as "social entity" or "social phenomenon"—if their realizations are so widely different, then we cannot say when something is a social phenomenon or a social entity. Kincaid actually admits (unrelated to the counter-argument presented here) that he cannot say what counts as a social entity, and can only state examples. (Kincaid 1997, 32.) This now has further repercussions for the applicability of the multiple realization argument against methodological individualism. The problem is that even if Kincaid knows (by some unspecifiable criteria) what counts as a social entity, and can state examples, we have no reasons to assume that the methodological individualist is aware of these criteria and that he or she would classify the same things as social entities or social phenomena. But then, when the methodological individualist says that social entities are reducible to individuals and their interactions and if Kincaid says that they are not because of the multiple realization argument, they do not necessarily contradict each other because they may mean different things by "social entity."

Without multiple realizability, the response to these dilemmas is simple and straightforward: social entities and phenomena obviously must meet certain criteria in order to be classified as the social entities and phenomena of a certain kind (or in general). In other words, to be what they are, and to be recognized as what they are, they must have certain, necessary, properties. It is because of their properties that we say that something is a bank, a revolution, a social entity or a social phenomenon. However, this response cannot be combined with multiple realizability. If social entities and phenomena are realizable by the multiple configurations of individuals, their interactions and properties, whose wild diversity

precludes the possibility of valid bridge-laws between the social-level and individual-level descriptions, then it is also impossible to state the properties that these diverse realizations of such social entities and phenomena have in common. Consequently, it becomes impossible to identify them. Saying that a social phenomenon or an entity has widely different realizations that have no properties in common, means saying that the realizations of such a social phenomenon or entity cannot be identified.

At the same time, reductionist individualists can comfortably say that social entities and phenomena are the sets of individuals and their interactions that have certain, specific properties that define them. If the properties of the actions and interactions of a set of individuals satisfy the definition of a bank, then these individuals and their interactions are a bank; if the properties of the interactions of a set of individuals satisfy the definition of a revolution, then these interactions are a revolution. The strategy also enables reductionist individualists to form sociological laws of the biconditional form 'if … then …'—for instance:

> If a set of individuals and their interactions X has the properties $p_1 \ldots p_n$ then it also has the property p_{n+1}.

whereby a set of individuals and their interactions needs to have the properties $p_1 \ldots p_n$ in order to be a certain kind of social entity or phenomenon: for instance, a bank or revolution.

An opponent of individualist reduction may try to apply the multiple realizability argument against this strategy. The argument would be again that (some of) the specific defining properties, that are said to identify the realizations of social entities and phenomena, may be themselves subject to multiple realizations in ways that make reduction impossible. But if such social phenomena or entities existed, the proponent of individualist reduction will respond, their realizations would have to be so diverse that they would have no properties in common that would enable us to identify them. We would end up with the concepts of social entities and phenomena that have no known or identifiable realizations.

3.

The argument against wildly diverse multiple realizability of social entities and phenomena presented in the previous section relies on the assumption that in order to operate[9] with the concept of a certain social entity or phenomenon one must have the criteria that an entity or a phenomenon must satisfy in order to be that entity or phenomenon. In order to operate with the concept of a revolution, one must know which are the properties that a social phenomenon must have in order to be a revolution. This assumption is an equivalent of the "classical" theory of concepts.[10]

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[9] "To operate with a certain concept" should be construed to mean here "decide whether an entity or phenomenon satisfies the criteria that an object needs to satisfy in order classify under the given concept." One should not assume that this is the only operation that the phrase designates.

[10] As Laurence and Margolis 1999, 10, put it, this is the understanding that concepts are "structured mental representations that encode a set of necessary and sufficient conditions for their applications, if possible in sensory or perceptual realm."

It has been also assumed that sets of individuals and their interactions can have properties. It is hard to see how this could be denied; methodological individualism that assumed that this is not the case would be an improbable and exotic doctrine that is very easy to refute. Nevertheless, some examples used by Sawyer and Kincaid in order to illustrate the multiple realization argument are marked by the assumption that the methodological individualist cannot attribute properties to the sets of individuals and their interactions.

We have already seen that Sawyer claims that "A reduction of the group-level natural kind term 'competitive team sport' to natural kind terms of individuals would involve the disjunction of all past and potential players' individual properties[11], in every past and potential competitive team sport, in all of the world's cultures." (Sawyer 2002, 549) However, there is nothing that says that a methodological individualist may not understand teams of players as aggregates of individuals (to use Kincaid's phrase)[12], games as sets of interactions between individuals, and attribute properties to these aggregates and sets of interactions. If "team sport" is conceived of as a set of individuals' interactions, then it must have some properties that differentiate such sets from the sets of interactions that we describe e.g. as "bureaucracy"—otherwise we could not tell one from another. Now, if "team sports" as sets of interactions between individuals have the properties that enable us to recognize a team sport, then these properties must be shared by all realizations of the sets of interactions that count as team sports. (If some realizations do not have them, we cannot say that they are team sports.) The individualist will consequently use these properties to form biconditionals: if $P_1 \ldots P_n$ are the properties that an interaction between individuals must have in order to be a team sport and if P_{n+1} is the property of being boring, then the statement "if X is a team sport, it is boring" becomes "if a set of interactions between individuals X has the properties $P_1 \ldots P_n$, it also has the property P_{n+1}." In other words, for Sawyer's argument to work, the methodological individualist would have to believe not only that social entities and phenomena can be reduced to sets of individuals and their interactions, but also that sets of individuals and their interactions (probably unlike any other sets in the Universe) cannot have properties.

A similar response can be given to Kincaid's example "if the French revolution failed there would be another bourgeois revolution in France." Kincaid used this example in order to illustrate the problems that would arise if one tried to reduce a social phenomenon ("a bourgeois revolution") to a disjunction of individual events (such as the English Revolution, the Dutch Revolution and so on). However, insofar as one seeks to reduce *sets of individuals' interactions* (i.e. interactions between individuals), reduction to *individual sets of interactions* (such as specific historical events) is a misleading digression. "Another bourgeois revolution" translates, on a straightforward individualist account, into "another set of individuals' interactions that has the properties that are necessary for an event to be classified as 'bourgeois revolution'." Consequently, the sentence that Kincaid stated as an example will be understood by an individualist as "Had the French Revolution not occurred, another set of individuals' interactions that has the properties that are necessary for an event to be classified as 'bourgeois revolution' would have occurred in France."

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[11] Again, "individual properties" is an ambiguous term; I understand it as "properties that belong to individuals." See notes 5 and 6 above for similar problems.

[12] "…few individualists deny aggregates exist." (Kincaid 1986, 493, n1)

One should mention that the same misunderstanding (that methodological individualism precludes the attribution of properties to the sets of individuals and their interactions) also underlies an argument mentioned by Steven Lukes and then repeated many times by Kincaid: that social entities cannot be reduced to individuals and their interactions because in the process of reduction one would be forced to refer to other social entities. (Lukes, 1968, 122, Kincaid, 1997, 23, 34, 35, 51) For instance, one cannot explain educational system without referring to teachers and one cannot explain teachers without mentioning schools, and schools are social entities. However, the argument will not convince an individualist, for whom the names of social institutions ("school" or "army" or similar) are but names for the sets of individuals and their interactions, applied if the given set of individuals and their interactions has the properties that make it classifiable as the institution in question.[13] There is therefore no reason why a methodological individualist should not be able to use these terms in the process of reduction: for a methodological individualist, a school, or a bureaucracy is a set of individuals and their interactions, that have certain characteristics that enable us characterize them as schools or bureaucracies.[14] The thesis of methodological individualism is not that institutions such as schools or armies do not exist, but that they are reducible to individuals and their interactions. It is an old individualist adage that such words have to be used because it is impractical, cumbersome and often impossible (using a description of a reasonable size) to refer to large sets of individuals and their interactions using sets of terms that refer exclusively to individuals taken singularly. (Jones 1996, 125-126, similarly Mellor 1982, 60) It does not help to argue against the methodological individualist that in the process of further reduction of an institution such as a school sooner or later one will have to rely on some irreducible concepts of social entities, because this is precisely what the methodological individualist denies—that there are such entities. Refuting methodological individualism by starting from a premise that denies it cannot count as a successful refutation.

4.

It has been argued so far that the multiple realizability argument against reduction in the social sciences requires identifiability, while identifiability contradicts multiple realizability—but if this is so, then why is the multiple realizability argument regarded as valid outside the social sciences? How come that this kind of counterargument does not

[13] For similar responses along these lines see Zahle, 2003, 85-86 and Greve, 2012, 212.

[14] A similar formulation is in Kincaid 1996, 146. He explicitly states that an individualist theory cannot refer to collective entities: "Social theories are ones that use social predicates or kind terms such as 'class,' 'organization,' 'state,' and so on. Individualist theories must refer only to individuals" and that "so long as the relationships involved make no assumptions about social entities or avoid social predicates, no harm is done." "So an individualist theory must be purely individualist; it must refer only to individuals and make no ineliminable assumptions about social entities or ineliminable use of social predicates." In Kincaid's presentation, the idea that social entities can be understood as eliminable is not considered, and on his account of the individualist position the phrase "is a member of the ruling class" is not a formulation that an individualist could use, since it "invokes a social entity, the ruling class, and thus would not eliminate social explanations—goal of reduction." The understanding that a class is a set of individuals and their interactions is simply not taken into account.

present a problem for the formulations of the multiple realizability argument outside the social sciences?

To respond to the dilemma one should compare the application of the multiple realizability argument in the social sciences with the way multiple realizations are said to characterize the relationship between, for instance, neurology and psychology. A definition of a psychological phenomenon P specifies the properties that something must have to be P. P may have many wildly different realizations, each of which will have their own neurological description, while, at the same time, because of their great diversity, there can be no joint *neurological* description for all of them. They are nevertheless identifiable on the basis of their *psychological* description. One can psychologically identify the realizations of psychological phenomena even without knowing anything about their neurological descriptions; in most cases, one needs to know nothing about neurobiology in order to recognize psychological phenomena.[15]

But assume that a description of a social phenomenon S specifies the properties s_1, s_2 … s_n that a set of individuals or their interactions must have in order to be S. Imagine now that the realizations of S are widely different, so that (although they are all sets of individuals and their interactions, as assumed by ontological individualism[16]) it is impossible to state a set of properties that they (and only they) share. In other words, it is impossible to state the properties that a set of individuals and their interactions must have in order to be S. But this cannot be the case, because it has been assumed that they all share the properties s_1, s_2 … s_n.

This situation is obviously not comparable with the relationship that exists between psychology and neurology. It is better compared with a model of psychology in which the definitions of psychological phenomena specify properties p_1, p_2 … p_n that a psychological state must have in order to be P. At the same time, in this alternative model, it is claimed that the realizations of P are so diverse that it is impossible to state a set of *psychological* properties that they all share—in which case it will be impossible to identify them using a psychological description. But this obviously cannot be the case, because it has been said that that they are identifiable by the properties p_1, p_2 … p_n. Multiple realizability argument in the relationship between psychology and neurology normally assumes that psychological phenomena are identifiable using the conceptual framework of psychology, but that it may be impossible to state a single set of neurological properties they must have—and that for that reason a definition of a psychological phenomenon (sometimes) cannot be translated with a single definition of a neurological phenomenon. However, when it comes to the application of the multiple realization argument advocated by Kincaid and Sawyer, the entities and phenomena that are reduced and to which they are reduced belong to the social sciences; they cannot both have and not have the properties that are necessary and sufficient to identify them. In other words, they cannot be *both* identifiable and unidentifiable using the properties that the social sciences attribute to the sets of individuals and their interactions. Because of ontological individualism, a social phenomenon or an entity must be a set of individuals and their interactions that have the properties specific for that phenomenon or entity—but then it

[15] See Greve 2012, 205 for this same point.
[16] See note 1.

makes no sense to say that its realizations are so diverse that they cannot have any properties in common.

5.

It may be useful to analyse here a model of the social sciences that endorses both ontological individualism and multiple realizability. This would mean formulating two types of the social sciences:

> *the higher-level* social sciences deal with the social entities and phenomena that are irreducible to the sets of individuals and their interactions (because of multiple realizability)

and

> *the lower-level* social sciences that deal with the social entities and phenomena that are reducible to the sets of individuals and their interactions.

The relationship between the higher-level and the lower-level social sciences replicates, within the social sciences, the relationship between, for instance, psychology and neurology. The way psychologists can empirically study human psychological reactions without any consideration of the neurological level, so higher-level social scientists should be able to study empirically social phenomena and entities and formulate laws about them without taking into account what happens on the individual level.

Once again, the problem with this comparison is that psychology and neurobiology are genuinely two different sciences. Consider the concept of a social phenomenon or entity (S) that is irreducible to any set of individuals or their interactions and consequently studied by the higher-level social science. Such an entity or a phenomenon is in that case defined by a set of identifying properties (s_1, s_2, … s_n) and we identify a phenomenon or an entity as S if it has these properties. But what kind of entities do these identifying properties (s_1, s_2, … s_n) define or identify? The assumption is that they cannot define or identify the sets of individuals and their interactions because in that case they would be actually the predicates of the lower-level social sciences. Saying that (s_1, s_2, … s_n) define or identify sets of individuals or their interactions means saying that such a set satisfies the conditions of being S and that consequently S is reducible to the sets of individuals and their interactions. In order to avoid this situation we have to assume that the properties that define S do not define or identify sets of individuals and their interactions. But if S does not define sets of individuals or their interactions and if consequently the realizations of S are not sets of individuals and their interactions, then, according to ontological individualism, its realizations are not social entities or a phenomena.[17]

This kind of situation does not arise in the relationship between psychology and neurology: psychology can define criteria that some neurological phenomena may satisfy or may not satisfy, but this does not mean that its predications are neurological predications. A

[17] See note 1.

psychological phenomenon P defined by properties p_1, p_2 … p_n may be realized by numerous neurobiological events N', N'', N''' whereby these Ns can be so diverse that it is impossible to find a set of properties of neurobiological processes n_1, n_2 … n_m that jointly define this set. In other words, it may be impossible to provide a joint neurological description that would identify all (and only) neurological phenomena that satisfy p_1, p_2 … p_n. In the case of the relationship between the higher-level and lower-level social science, this explanation is not applicable. Assume that I^1, I^2, … I^i, … I^n are the realizations of a social entity or a phenomenon S, where each I^i is defined as a set of individuals and their interactions that has lower-level properties i^i_1, i^i_2 … i^i_m that are characteristic for it.[18] Let also S be defined as any social entity or phenomenon that has the higher-level properties s_1, s_2, … s_n. Then if I_1, I_2, … I^i, … I_n are widely diverse realizations of S, they cannot share the properties s_1, s_2, … s_n—in which case they cannot really be its realizations because they do not have the properties that are necessary for them to be S. In fact, since their descriptions are widely different and it is impossible to state a set of properties that jointly define them, then it is also impossible to say which social entity or phenomenon they realize. In other words, it is impossible to state the definition of the social entity or phenomenon they realize because it is impossible to state the properties that something must have in order to be that entity or phenomenon. Vice-versa, if I^1, I^2, … I^i, … I^n all have the properties s_1, s_2, … s_n, then they are not wildly diverse. The analogy between psychology and neurology on the one hand and the higher- and lower-level social sciences on the other cannot be established because both kinds of social sciences define the phenomena and the entities they study by specifying the properties that the sets of individuals and their interactions must have in order to be these phenomena and entities. Psychology, however, can define its phenomena by stating the properties a phenomenon must have in order to be that phenomenon independently of neurology; the fact that the same phenomena have no joint neurological definition does not affect their psychological definition.

Conclusion

In the philosophy of mind, Fodor's argument about multiple realizability has exercised a huge influence—and also met significant opposition. (Kim 1989 and 1992) Whatever its relevance for the philosophy of mind, the argument does not provide a useful perspective when it comes to the reducibility of social entities and phenomena to the sets of individuals and their interactions. It is one thing to argue that phenomena that can be covered by a single definition in one discipline can be described in another discipline only by using a great variety of different descriptions. It is quite another thing to argue that, within one and the same discipline, one can define entities and phenomena, in a way that is sufficient for identification, while at the same time, these phenomena and entities are so wildly diverse that, within that same discipline, one cannot state their joint definition that would enable their identification.

[18] They have to be sets of individuals and their interactions because of ontological individualism. See note 1.

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