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Hayek's twin ideas: reconciling methodological individualism and group selection

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Hayek repeatedly refers to 'the twin ideas of evolution and spontaneous order'. Yet, critics argue that Hayek's theory of cultural group selection is inconsistent with his theory of spontaneous order. To assess these criticisms, this paper situates Hayek's social theory in the contemporary discussion surrounding multilevel selection. Hayek's theory posits two main levels—rules and order—that exhibit upward and downward causation. An examination of Hayek's theory of cultural group selection and his account of methodological individualism reveals that neither one can provide a fully adequate explanation of social phenomena. Neither individualistic nor group-selectionist analyses allow the theorist to fully account for social order, but taken together they provide a more complete explanation. Far from being substitutes, therefore, both types of analysis are complementary aspects of Hayek's social theory. Understanding Hayek's theory in this way allows us to glimpse how he might weigh in on contemporary debates surrounding multilevel selection in human societies.

Key words: Hayek, Multilevel selection, Cultural evolution, Methodological individualism, Evolutionary economics
JEL classifications: B5, B25, B41

1. Introduction

In one breath F. A. Hayek will urge the primacy of 'orderly structures which are the product of the action of many men but are not the result of human design' (Hayek, 1973, p 37); in the next, however, he will emphasise that social structures owe their persistence or extinction to their tendency to 'increase or decrease the efficiency of

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the group as a whole' (Hayek, [1967A] 2014, p 283). Critics have claimed that Hayek thus posits two distinct accounts of the emergence of social institutions: one which emphasises the local adjustments of individuals unintentionally giving rise to social structures, another which emphasises the effectiveness of macro-level properties and their adaptiveness in the context of intergroup competition. 'Hayek's appeal to a process of cultural evolution operating at the group-level as such', writes Viktor Vanberg (1986, p 85), 'stands in contrast to his explicit methodological individualism… and to what is otherwise the main thrust of his work'. This inconsistency, according to Vanberg (1986, p 85), 'represents a major flaw in Hayek's reasoning'.[1]

The tension between these two processes is not an idiosyncratic error in Hayek's system of thought. Rather, it is endemic to the dynamics of group adaptation more generally. Theories of multilevel selection acknowledge that adaptation occurs on a multiplicity of scales. A simple, illustrative model of multilevel selection posits two levels: individual organism and social group.[2] Based on these disparate levels of selection, the evolutionary biologist David Sloan Wilson defines two types of adaptive system:

> *Complex Adaptive System 1 (CAS1)*: "A complex system that is adaptive as a system.
> *Complex Adaptive System 2 (CAS2)*: 'A complex system composed of agents that employ adaptive strategies' (Wilson, 2016, p 32).

CAS1 adaptations occur when systems or groups adjust to their environments, environments which include other systems or groups. Group selection is an example of a process of CAS1 adaptation. By contrast, CAS2 adaptations occur via the local adjustments made by individual elements that make up a system or group. Invisible hand processes, in which individuals pursue values and unintentionally produce macrostates, are paradigmatic of CAS2 adaptation. Importantly, CAS1 processes will involve changes in individual behaviour, just as CAS2 processes will generate group-level modifications.

The distinct nature, and alleged incompatibility, of these two processes has led to a dialectic in which evolutionary theorists—be they biological or cultural—tend to champion one of two broad camps: those who grant primacy to selection at the group level and those who emphasise invisible hand processes that ultimately give rise to group characteristics (Mesoudi, 2011, pp 51–3). For conciseness, the former group will be referred to as 'CAS1 theorists', the latter as 'CAS2 theorists'.

Much of the literature that examines Hayek's use of evolutionary theory asks whether he is (or should be) a CAS1 or a CAS2 theorist. Whichever answer he provides, commentators claim, will entail serious alterations to his theory. If Hayek grants primacy to intergroup competition, they claim, then the role of individual-level adaptations is diminished. Hayek is no longer a *bona fide* methodological individualist, seeking to explain culture and institutions as the results of 'human action but not human design'. Not only does this rejection of methodological individualism put Hayek at odds with his earlier work, which champions the 'compositive method' of deducing macro-results

[1] For others who have identified these as incompatible explanations, see Hodgson, 1991; Steele, 1987; Gray, 1984, pp. 52, 55; Ullmann-Margalit, 1978, pp. 282ff; and Denis 2014. As Gaus (2020, p 38) points out, methodological individualism is a contested concept, with a host of incompatible meanings. I clarify the version of methodological individualism to which Hayek subscribes in Section 2.2. For present purposes, the essential point is that Hayek's critics take methodological individualism to encompass all invisible hand explanations involving decentralised self-organisation by individuals.

[2] For such a model, see Sober and Wilson, 1999, 19–21.

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from individuals' behaviour (Hayek, [1952B] 2010; Hayek, [1943] 1980), but it also calls into question Hayek's self-identification as a philosophical descendant of the Scottish Enlightenment. Invisible hand explanations feature prominently in Hayek's reading of theorists such as Adam Smith and Adam Ferguson, whose philosophical movement Hayek takes himself to be reviving and extending (Hayek, [1967A] 2014, pp 96 ff.).

On the other hand, if Hayek abandons his group-selectionist bent (CAS1) and wholly embraces methodological individualism (CAS2), then he faces the challenge of explaining why the emergent properties would be desirable or beneficial.[3] As Jonny Anomaly and Geoffrey Brennan (2014) explain, for any invisible *hand* process that results in a benefit to the group, there also looms an invisible *fist* process that threatens to undermine group functionality. Wilson's view is even more pessimistic: not only are individual adaptations logically unrelated to group level fitness, they actually tend to undermine it. In many cases, opportunistic adaptations on the individual level can engender 'a breakdown of group-level functional organisation', because '[b]etween-group selection, if it takes place at all, is not sufficiently strong to oppose within-group selection. The groups remain functionally impaired indefinitely..'. (Wilson, 2016, p 38). If Hayek emphasises local adjustments over group adaptations, therefore, he weakens the social-scientific basis of his anti-interventionist political stance. For, if CAS2 adaptations cannot be expected to generate socially beneficial outcomes, then the government must actively endeavour to make individual behaviour compatible with group functionality (Wilson, 2016, p 45).[4]

In sum, several commentators agree that Hayek must either abandon methodological individualism as the explanatory paradigm of social science or he must abandon his group-selectionist arguments. And they also agree that neither course leaves his broader theory intact.

This supposed dilemma achieves plausibility only by mischaracterising Hayek's view. Far from conflating two distinct evolutionary processes, Hayek incorporates both processes as integral features of his broader theory. Hayek's view is best interpreted as a multilevel selection theory involving both upward and downward causation. The argument for this interpretation of Hayek's view unfolds as follows: section 2 explains why neither group selection nor methodological individualism can provide an adequate explanation of social order when considered in isolation. By combining these two approaches, section 3 argues, Hayek provides a more satisfying explanation. *Pace* Hayek's critics, these two fundamental approaches hang together as a unified framework for explaining social phenomena.

2. The inadequacy of CAS1 and CAS2 approaches

Hayek's critics make two assertions. First, in advocating for a CAS1 or CAS2 approach, they suggest that Hayek's evolutionary theory *or* his methodological individualism, respectively, provide an adequate explanation of social order. Second, they hold

[3] Daniel Klein (1997) has noted that Menger himself thought there was little reason to expect evolved conventions to yield efficient outcomes.

[4] Although, as Gerald Gaus pointed out to me, an unstated assumption here is that a central governor would outperform CAS2 processes.

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that this 'or' is exclusive: Hayek's theory of group selection and his methodological individualism are incompatible accounts.

Before assessing CAS1 and CAS2 approaches as stand-alone explanations, it is necessary to briefly consider what makes for an adequate explanation. Hayek often cites two philosophers of science, Karl Popper and Ernest Nagel, whose theories are representative of the prevailing philosophy of science in Hayek's day.[5] Both of these philosophers advocated versions of the *deductive-nomological* theory of scientific explanation, in which explanations consist of a set of propositions, at least one of which is a scientific law, that jointly necessitate the outcome to be explained. In a book dedicated to Hayek, Popper explains that, for a theory to constitute an *explanation* of observable facts, 'a description of these facts must be deducible from the theory in conjunction with certain statements, the so-called "initial conditions"' (Popper, 1968 [1962], p 103).[6] This sets a rather high bar for Hayek: an explanation of social order must include empirical and law-like propositions that necessitate the emergence of that order. To clear this high bar, I will argue, Hayek must employ both types of explanation: group selectionist and methodological individualist.

2.1 Downward causation: Hayek's evolutionary theory

According to Vanberg (1986, pp 83–4), CAS1 theorists advocate 'collective functionalism', a view that posits a 'direct link' between benefit to the group and the emergence of a macrostructure. Such explanations clash with methodological individualism due to the fact that individual advantage and group benefit often pull in opposing directions. For Vanberg, this means that the predictions of a collective functionalist view are *implausible*, since they fail to account for the decisions made by individuals on the basis of their personal interests. Worse yet, collective functionalist explanations are also *vague,* because the mechanism by which collective functionality actually gives rise to macrostructures remains unspecified. Given that Hayek's theory of cultural evolution is a type of collective functionalism, Vanberg asserts, it thus exhibits both major issues: implausibility and vagueness. These issues set the challenge for Hayek's use of group selection. Can a CAS1 approach avoid implausibility by explaining how self-interested behaviour is compatible with group interest? And can it avoid vagueness by explaining the mechanism by which group benefits cause group adaptations? Without resolving both of these issues, CAS1 theory cannot provide a *bona fide* explanation, at least not according to the deductive-nomological theory outlined above.

With respect to the challenge of implausibility, contemporary group selection theory has made major strides in clarifying how group selection might occur in the face of individual-level selective pressures. Contemporary group selectionists, such as Sober and Wilson (1999), have clarified how group-level pressures can overcome individual-level ones, even when these pressures direct behaviour in opposite directions. Multilevel selection theorists often point to Price's equation to clarify the conditions under which pressures at a higher level will swamp those at a lower level in the evolutionary process (Turchin, 2011, p 8; Okasha, 2006, pp 62 ff.). When within-group diversity is small, between-group diversity is large, and when individuals within groups have relatively

[5] While Caldwell (2004b, pp 249; 2014, p 15) does not claim that Hayek adopted Popper or Nagel's theories of explanation, he does suggest that they likely influenced Hayek's philosophy of science in other areas.

[6] Ernest Nagel (1979, pp 29–46) defends a similar view of explanations.

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equal fitness, group selection can successfully overpower individual-level selective pressures.

When group selection occurs, the result is what evolutionary theorists call 'downward causation' (Flack, 2017; Corning and Szathmáry, 2015; Ellis, 2012; Hayek [1967A] 2014, p 288). Lower-level elements tend to exhibit those traits and behaviours that prove to be adaptive for the group. At the limit, the group can actually become a 'superorganism', programming its constituent individuals to behave in coordinated, group-beneficial ways (Szathmáry, 2015). This process has been thoroughly explored by models that demonstrate its possibility under various circumstances. It has also been verified empirically (Hamilton, 1967; Lewontin, 1970; Maynard-Smith and Szothmary, 1995; Wade, 2003). There is therefore no justification, at least given what we know today, for Vanberg's assertion that Hayek's theory of group selection is 'implausible'. Indeed, in offering his own criticism of Hayek, Geoffrey Hodgson (1991, p 69) makes the same point: 'Vanberg was wrong to dismiss group selection so easily.... [A]mong biologists the notion of group selection is not so reprehensible as Vanberg suggests, and it retains some considerable support from a number of theorists and philosophers'.

There is another criticism of group selection theory, different from Vanberg's, that also claims to show its implausibility. So-called 'gene reductionists' claim that groups are not suitable as units of selection (Williams, 1996). As Richard Dawkins memorably put it,

> [g]enetically speaking... groups are like clouds in the sky or dust-storms in the desert. They are temporary aggregations or federations. They are not stable through evolutionary time.... A population is not a discrete enough entity to be a unit of natural selection, not stable and unitary enough to be 'selected' in preference to another population. (Dawkins, 1989 [1976], p 34)

Groups lack the longevity and stability of genes. Hence, they cannot function as 'replicators', i.e. as units of selection.

Although critics of group selection are right to attack naïve accounts that take groups to be replicators, this is not Hayek's view. For him, the replicator is a *system of rules*, not the group or even the emergent order of actions: 'the natural *selection* of rules will operate on the bases of the greater or lesser efficiency of the resulting *order of the group*' (Hayek, [1967A] 2014, p 279). Selection takes place at the level of social order, the 'vehicle' (Dawkins, 1989 [1976], p 19), but the thing selected, the 'replicator', is the system of rules.

Having identified replicators as rule systems and vehicles as social orders, Hayek is able to sidestep the criticism that groups are too unstable to be replicators. They aren't the replicators, they are the vehicles. In this way, Hayek was ahead of his time. As Kim Sterelny explains, recent theories of group selection are best understood as claiming that 'groups function in evolution in the same way organisms do. That is, group selectionist hypotheses are about vehicles, not replicators' (Sterelny, 1996, p 564). Much of Hayek's work on cultural evolution aims to demonstrate that systems of rules exhibit heredity, variation, and selection — sufficient conditions for evolution to take place (Mesoudi, 2011, pp 27–34).[7]

[7] Perhaps these are not *necessary* conditions, however, since heredity might be replaced with mere longevity. 'Darwin"s "survival of the fittest" is really a special case of a more general law of *survival of the stable*' (Dawkins, 1989 [1976], p 12).

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Hayek's CAS1 approach stands up well to the criticisms of both Vanberg and Dawkins that call into question the plausibility of group selectionist accounts. However, it remains to be seen whether or not Hayek's account is guilty of *vagueness*, as Vanberg asserts. All theories, to some extent, stylise, so vagueness falls along a spectrum. However, recalling Hayek's commitment to the deductive-nomological theory of scientific explanation, we might posit that to be 'too vague' for Hayek means that a theory fails to provide a set of sufficient conditions entailing the explanandum. Taking this view, it's clear that Vanberg is correct: there is a major gap in Hayek's group-selectionist theory of social order. Although Hayek adequately spells out the process of downward causation from group-beneficial order to the proliferation and extinction of certain systems of rules, group selection alone fails to specify how systems of rules actually produce order. Some rules will generate beneficial orders, some will generate dysfunctional orders, and some will fail to produce order at all (Hayek, 1973, p 44). Without explaining how this process works, Hayek's social theory does not meet the requirements of scientific explanation, since there is a largely unexplained link between certain systems of rules and certain group-level traits. In other words, despite providing a detailed account of downward causation, group selectionism says nothing about the process of *upward causation*.

2.2 Upward causation: methodological individualism and spontaneous order

In Vanberg's view, methodological individualism and spontaneous order, closely related concepts, provide the main alternative model for explaining social phenomena. For Hodgson, however, this explanatory method fails to accomplish Hayek's goals. Hodgson criticises methodological individualism, first, for being incomplete (Hodgson, 1991, pp 78–9). Methodological individualism, as Hodgson understands it, takes individual values for granted, eschewing explorations into psychology and preference-formation. From there, it attempts to work up explanations of human behaviour by individuals acting within groups. By leaving the origins of human nature unexamined, Hodgson asserts, Hayek fails to provide a full account of 'long-run changes and developments in a social context' (78). An adequate explanation of social order must therefore 'involve a discussion of the moulding of individuals by circumstances as well as of circumstances by individuals', that is, it must provide an 'evolutionary perspective' (79).

Hodgson also questions whether Hayek's social theory is consistent with his anti-interventionist stance (80). This second criticism is echoed most clearly by Wilson:

> … there is an unstated assumption that [CAS1 and CAS2] are compatible with each other; in other words, that a system composed of agents which employ adaptive strategies is adaptive as a system. The metaphor of the invisible hand, which has played such a central role in the history of economic thought, embodies the same assumption. But a proper understanding of evolutionary theory leads unequivocally to the conclusion that these two meanings are not compatible with each other, except under special conditions (Wilson, 2016, p 33).[8]

According to both Hodgson and Wilson, there is no reason whatsoever to believe that individual-level adaptations will facilitate collective functionality.[9] In fact, given the

[8] Note that Wilson *does* apply his critique directly to Hayek's work in his book *Does Altruism Exist?* (Wilson, 2015, pp 95–6). His criticism is marred by the fact that he ignores the importance that Hayek places on the institutional framework that channels CAS2 processes. See Boettke (2019, pp 25).

[9] In fact, many spontaneous orders, produced by individuals adhering to local norms, are rather horrific; they are far worse than close alternatives or even than having no norm whatsoever governing that specific domain. Henrich (2017), offers a host of gruesome examples of suboptimal norms that would qualify as spontaneous orders. For a cringe, see page 161.

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prevalence of social dilemmas, individual-level adaptations are likely to undermine group success. Wilson, associating Hayek with the view that 'greed is good', thus finds Hayek's use of evolutionary theory ironic (Wilson, 2015, pp 95–6, 100).

Examining the veracity of this criticism requires at least a rough understanding of how Hayek understands methodological individualism and how he employs it to explain spontaneous social orders. Both the meaning of 'methodological individualism' and its relation to the idea of spontaneous order must be examined.

For Hayek, the basic idea of methodological individualism is that an explanation or understanding of social phenomena must begin with an analysis of individual human action: 'there is no other way toward an understanding of social phenomena but through our understanding of individual actions' (Hayek, [1952C] 2010, p 6). This does not mean the theorist cannot speak of groups or of collective action. But such concepts must, ultimately, be analysed in terms of the behaviour of individual actors.[10] The need for an analysis of individual human action comprises at least two features. The first feature, often referred to as *Verstehen*, concerns the need for interpretive understanding in the explanation of human behaviour.[11] Hayek concisely characterises this methodological postulate by saying that '[s]o far as human action is concerned, things *are* what the acting people think they are' (Hayek, [1943] 1980, p 89).[12] As an important corollary of this truism, costs and benefits must be construed *subjectively*, and human action, therefore, cannot be understood until one comprehends the agent's subjective viewpoint.

Equally important is Hayek's explanation of *why* social science must begin with an analysis of individual human action. According to Hayek, social phenomena are often too complex or too abstract to be perceived without a theory that constructs them from the behaviour of interacting individuals. Consequently, methodological individualism is not merely a tool of explanation, but also a tool of discovery. In the social sciences, Hayek claims,

> … it is the attitudes of individuals which are the familiar elements and by the combination of which we try to reproduce the complex phenomena, the results of individual actions, which are much less known—a procedure which often leads to the *discovery* of principles of structural coherence of the complex phenomena which had not been (and perhaps could not be) established by direct observation. (Hayek, [1952B] 2010, pp 101–2)[13]

[10] Caldwell (2004b, pp 279–87) identifies this as one of the areas in which Hayek's conception of methodological individualism overlaps with the more common mainstream notion of methodological individualism. At the same time, he is adamant that Hayek rejects (much of) the version of methodological individualism that posits an idealised model of rational economic man.

[11] Denis (2014) emphasises *Verstehen* in his account of methodological individualism.

[12] This methodological postulate traces back through Ludwig von Mises (2007 [1949]: p. 43), all the way to Carl Menger. Mises writes, 'It is illusory to believe that it is possible to visualise collective wholes. They are never visible; their cognition is always the outcome of the understanding of the meaning which acting men attribute to their acts. We can see a crowd, i.e., a multitude of people. Whether this crowd is a mere gathering or a mass (in the sense in which this term is used in contemporary psychology) or an organised body or any other kind of social entity is a question which can only be answered by understanding the meaning which they themselves attach to their presence. And this meaning is always the meaning of individuals. Not our senses, but understanding, a mental process, makes us recognise social entities'.

[13] See also (Hayek, [1943] 1980: 98; [1967B] 2014: 70; [1964] 2014: 259; [1943] 1980: 89–90): 'Social theory… is, then, logically prior to history. It explains the terms which history must use… The social complexes, the social wholes which the historian discusses, are never found ready given as are the persistent structures in the organic (animal or vegetable) world. They are created by him by a work of construction or interpretation—a construction which for most purposes is done spontaneously and without any elaborate apparatus. But in some connections where, for example, we deal with such things as languages, economic systems, or bodies of law, these structures are so complicated that, without the help of an elaborate technique, they can no longer be reconstructed without the danger of going wrong and being led into contradictions'.

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These complex phenomena—for example, the nature of general equilibrium in a market economy—are abstract, not concrete, and therefore not available to perceptual observation.[14] Consequently, the social scientist cannot proceed by analysing some perceivable whole into its basic elements, as Hayek believed was the common approach in the physical sciences. Instead, when explaining phenomena of high complexity, the social scientist must start with the basic elements and reconstruct these complex phenomena before such phenomena can be understood or sometimes even recognised.

Does Hayek mean to assert that we can deduce complex phenomena by identifying the basic elements and processes that give rise to them? There is good reason to reject this position whether or not Hayek held it. First, a hallmark of emergent phenomena is that one cannot infer their properties from the underlying elements; emergent phenomena are, in some sense, surprising.[15] Many of the complex wholes that Hayek seeks to understand are emergent phenomena in this sense. Moreover, they are *complex*. The mind-boggling combinatorics involved in complex systems—systems with large numbers of interrelated, heterogeneous parts—pose serious challenges for any attempt to reverse engineer them (Green, 2015). Finally, Hayek himself rejects the ability of social science to explain or predict particular outcomes in complex systems, like society.[16] We cannot, therefore, trace out the implications of individual actions that give rise to particular macrostates.

Hayek *does*, however, seem to hold that social science enables us to understand certain relations or patterns exhibited by complex or abstract systems. Hayek calls these results 'pattern predictions' and explanations (Hayek, [1975] 2014, p 371). We cannot explain or predict the exact list of prices at a given moment in time; we cannot explain or predict the exact phenotype of a particular species at a given moment in the future. However, in both cases, we can start with simple assumptions about how basic elements behave and, from there, trace out a process that will reveal *general patterns*. Markets will tend toward market-clearing prices; genetic evolution will tend toward organisms that are well adapted to their environments, which include other organisms. In both cases, we rely on basic constituents to reveal general patterns that will emerge on the macro-level. The intellectual task of the social scientist is thus poorly described by the term *analysis*; it is, instead, a *synthesis* or *composition* (Hayek, [1952B] 2010, pp 101–2). Accordingly, the term 'explanation by methodological individualism' will be used interchangeably with the more concise 'compositive explanation'.

This expanded construal of Hayek's methodology captures the intuitive notion of methodological individualism that critics ascribe to Hayek. In particular, the core of this more detailed conception of methodological individualism is *the reconstruction of emergent social phenomena—such as spontaneous orders—in terms of individual behaviour*.

[14] 'The "emergence" of "new" patterns as a result of the increase in the number of elements between which simple relations exist, means that this larger structure as a whole will possess certain general or abstract features which will recur independently of the particular values of the individual data, so long as the general structure (as described, e.g., by an algebraic equation) is preserved. Such "wholes", defined in terms of certain general properties of their structure, will constitute distinctive objects of explanation for a theory, even though such a theory may be merely a particular way of fitting together statements about the relation between individual elements' (Hayek, [1964] 2014: 261–2). See also (Hayek, [1967A] 2014: 281–2; [1967B] 2014: 70).

[15] Gaus (2018: 675; 2019: 976; 2020: 38) discusses this feature of emergence.

[16] In Hayek's (2014B, 201, fn.3) view, explanation and prediction are nearly equivalent intellectual tasks.

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It thus implicates the sort of invisible hand explanations that Vanberg and others consider to be inimical to Hayek's group selection account of cultural evolution.

Having explained the meaning of *methodological individualism*, we can now address the second key idea: the relation between methodological individualism and spontaneous order. In contrast to what Hayek (1973, p 49) calls 'organisations', *spontaneous orders* emerge without commands. Instead, a set of behaviour-regulating rules gives rise to an undesigned pattern of interaction. The rules, in this case, are not tailored to achieve some pre-specified goal. Such orders are thus 'not the result of all the factors being taken into account by a single centre', but rather are 'produced by the responses of the individual elements to their respective surroundings' (Hayek, [1955B] 2014, pp 160–1).[17] '[I]f a multitude of individual elements obey certain general laws', Hayek explains, 'this may... produce a definite order of the whole mass without the interference of an outside force' (Hayek, [1955B] 2014, p 160). Whereas the rules that undergird organisations come attached to defined positions with specified goals and serve as complements to commands, the rules that underlie spontaneous orders 'must be independent of purpose and be the same… for whole classes of members not individually designated by name' (Hayek, 1973, p 50). Importantly, these rules are 'applied by the individuals in the light of their respective knowledge and purposes; and their application will be independent of any common purpose'.[18]

For Hayek, the abstract nature of these spontaneous orders entails the need for methodological individualism in examining them. Because the interactions between millions of individuals, following only general rules, will exhibit abstract, imperceptible patterns—what Hayek calls 'abstract spontaneous orders' (Hayek, 1973, p 38)—we cannot hope to perceive, much less understand, society by examining it only at the aggregate or macro-level. There is no antecedently known pattern which the order strives to realise, and our minds have not evolved to directly perceive abstract, algebraic patterns that are liable to emerge. Although not all spontaneous orders will be abstract (and hence imperceptible), many of them will be, 'and for this reason will not be intuitively perceivable and not recognisable except on the basis of a theory accounting for their character' (Hayek, 1973, p 38). In sum, Hayek's multi-part claim is that (1) many orders within society are spontaneous in the sense that they emerge from rule-following agents, rather than an overarching plan, (2) these orders are often *abstract* and thus imperceptible, and (3) any adequate account of an abstract spontaneous order will employ a compositive explanation. This type of theorising—viz. the process of *mentally reconstructing* a spontaneous order *by tracing the relations that exist between the elements*—is essentially what Hayek calls methodological individualism.

The economic explanation of social phenomena thus runs from the subjective values, beliefs, or rules that determine individual behaviour to the order of actions that emerges when a number of such individuals interact. But, as Wilson and Hodgson are acutely aware, this story contains rather wide gaps. Why should the social scientist assume that the rules followed by individuals will give rise to a spontaneous order, rather than disorder or chaos? And more normatively, given that some orders may be suboptimal or even ghastly, on what basis can we endorse the resulting spontaneous

[17] Cf. Hayek (1973, 43): 'the result of their elements following certain rules in their responses to their immediate environment'.

[18] This does not imply that there is no common purpose; simply that the individual need not know this purpose in making her decisions. See Mack (2006).

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order, as Hayek suggests we should? Vanberg's criticism of the CAS1 approach thus seems equally applicable to the CAS2 approach, just as Wilson and Hodgson have claimed. Methodological individualism, like group selection, leaves large explanatory gaps when considered in isolation. As a result, just as group selection fails to satisfy the deductive-nomological criteria of explanation, so does compositive explanation.

As shown in Section 3, to fill these gaps, Hayek turns from the individualistic methodology of pure economics and draws upon multilevel selection theory. The need to account for the explanatory gaps identified in sections 2.1 and 2.2 thus helps to explain why Hayek believed that 'nobody can be a great economist who is only an economist' (Hayek, 1956, p 123). By appreciating the integration of these explanatory approaches, Hayek's social theory can finally be understood.

3. Reuniting the twins: Hayek's multilevel selection theory

As noted above (Section 1), several commentators view Hayek's dual use of methodological individualism and group selection theory as contradictory; Hayek's social theory must be modified so as to avoid either CAS1 or CAS2 explanations. Bruce Caldwell (2004a) presents an alternative view. Although he concurs with the critics that Hayek is inconsistent, Caldwell does not think that Hayek should be viewed as either a CAS1 theorist or a CAS2 theorist. Rather, Hayek's enthusiastic endorsement of methodological individualism represents an early phase, and group selection theory eventually superseded Hayek's early individualism. To support his account of Hayek's methodological transition, Caldwell cites Hayek's 1967 paper on cultural evolution, 'Notes on the Evolution of Systems of Rules of Conduct', where Hayek describes how systems of rules will expand or recede to the extent that they affect the 'greater or lesser efficiency of the resulting *order of the group*' (Hayek, [1967A] 2014, p 279).[19] While Caldwell concedes that individuals still play a role in this process, since it is through their adoption of and adherence to rules that the order obtains its properties, he claims that Hayek's earlier endorsement of methodological individualism as the *only* way to understand social phenomena (Hayek, [1952C] 2010, p 6) was, plainly, a 'misstatement' (Caldwell 2004a, p 285).

In Caldwell's view, it is unimportant whether or not Hayek is a doctrinaire methodological individualist. Caldwell resolves the apparent tension between group selectionist explanations and methodological individualism by simply allowing that sometimes Hayek employs compositive explanations and sometimes group-selectionist ones. *Pace* Vanberg, Hodgson, and others, Caldwell's solution does not force a choice. Group selection and the compositive method are simply two alternative tools in the social scientist's toolbox, perhaps suited to explain different phenomena. There is, however, an issue with Caldwell's reading: Hayek employs the two tools *simultaneously*. In fact, the very text that Caldwell cites to establish Hayek's supposed withdrawal from methodological individualism includes an endorsement of the compositive method:

> ... it is often easier to ascertain the rules of individual conduct than to trace from them the resulting overall and often highly abstract order.... *the 'functions' which these rules serve we shall be able to discover only after we have reconstructed the overall order which is produced by actions in accordance with them* (Hayek, [1967A] 2014, pp 281–2).[20]

[19] See also Hayek 1978, p. 158.
[20] Emphasis added.

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Here we see Hayek advocating the compositive method of intellectually reconstructing social orders from an understanding of the actions of individual agents. If group selection and methodological individualism were, indeed, two alternative, mutually exclusive types of explanation, it would be odd for Hayek to explicitly endorse both in the same article. It would be even stranger for Hayek to claim that both are necessary for understanding the nature of social rules. It seems, then, that Hayek does not view these methods as exclusive alternatives. He must hold that they somehow work together.[21]

As we have seen (Section 2), neither compositive explanations, nor group selection theory taken alone can provide a complete explanation of social phenomena. Moreover, since each of these explanatory methods contributes different elements to the full explanation of social phenomena, they are mutually compatible. Being neither (full) explanations of the same phenomenon, nor mutually exclusive, they do not constitute *alternative* methods of explanation. Since, taken alone, each type provides an incomplete explanation of the phenomena, Hayek's claim that methodological individualism is *necessary* for an adequate understanding of social phenomena is compatible with the claim that group selection is also *necessary*. Importantly, Hayek does not, and should not, claim that either approach is *sufficient* to achieve a complete explanation. For Hayek, the two approaches are not, as Caldwell supposes, substitutes; they are complements.

To see how these two explanations work together, recall the major gaps that emerge when each is considered in isolation. Group selection alone leaves us in the dark about how orderly structures emerge from the myopic, rule-following behaviour of individuals. Methodological individualism, on the other hand, fails to explain why individuals end up following rules that are conducive to functional orders.

In discussing the concept of spontaneous order, Hayek himself notes that methodological individualism alone fails to explain the 'invisible hand' (Hayek, [1967B] 2014, p 298). Although Hayek's normative argument does not rely on the claim that currently existing orders are optimal (Hayek, [1960] 2011, p 48; Hayek, 1988, p 27; Whitman, 1998), it does depend on the claim that the spontaneous orders will generally be beneficial, even if suboptimal.[22] As Wilson and others have pointed out, explanations of social phenomena that employ methodological individualism *alone* provide no reason whatsoever to believe this (Wilson, 2015, pp 95–6). Considering the deductive-nomological theory of explanation, then, the CAS2 approach utterly fails to provide an adequate explanation of functional group order.

Hayek's solution comes in the form of his theory of group selection. In the context of discussing the invisible hand, Hayek writes,

> ...neither Smith nor any other reputable author I know has ever maintained that there existed some original harmony of interests irrespective of… grown institutions. What they did maintain... was that institutions had developed by a process of the elimination of the less effective which did bring about a reconciliation of the divergent interests. (Hayek, [1967B] 2014, p 98).[23]

[21] One must concede to Caldwell the point that, towards the end of his career, Hayek increasingly emphasises group selection and mentions methodological individualism more sparsely. The present argument turns less on this historical point than on the theoretical point that these two strands of Hayek's social theory complement one another.

[22] Hayek (1978, 168) also maintains that spontaneous orders are a *necessary*, though not sufficient, condition for the successful pursuit of nearly *any* personal end in a modern society.

[23] See also Hayek 1988, 27–8; 1973, 44.

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We expect our *grown institutions*, the rules that regulate our behaviour, to produce beneficial results only because they are the result of a process of group selection. By positing selection at the level of groups—the process detailed in Section 2.1—Hayek thus provides an account of the functionality (though not the optimality) of the systems of rules that have evolved. We expect these systems to give rise to order rather than disorder simply because a society lacking order will not inspire imitation, will not support wealth creation or population growth, and will be vulnerable to invasion. Hayek thus uses group selection to supplement his individualistic, compositive explanations of social order, explanations that fail to provide a full account without this addition.

Just as methodological individualism requires group selection, so the converse holds. On its own, group selection can explain why the patterns of interaction that arise within groups will be conducive to the functionality of these groups. But it cannot explain what Hayek considered to be the most important object of the social sciences: the nature and existence of spontaneous orders. The special properties of the various spontaneous orders that make up society simply cannot be explained (or perhaps even perceived, as noted above [Section 2.2]) without additional theorising. A massive black box mediates between collective functionality and, for example, the properties of the *catallaxy* or of a particular social morality. Group selection, therefore, fails to provide a true explanation of social phenomena, at least according to the theory of explanation with which Hayek was likely working.

To replace the black box with a *bona fide* explanation, Hayek invokes compositive explanations. Methodological individualism bridges the gap between rules of conduct and social order—that is, between replicators and vehicles. Evolutionary biology provides an apt analogy here: just as the theory of natural selection explains how certain packages of genes spread throughout a population, so cultural group selection explains how certain systems of rules spread throughout human societies. And just as microbiology explains how variations at the genetic level produce specific phenotypic expressions, so the compositive approach of social science explains how variations at the level of rules give rise to orders of a certain kind with certain properties. To claim that group selection and methodological individualism are mutually exclusive alternatives is as mistaken as claiming that natural selection and microbiology are mutually exclusive explanations of the same phenomena.

The correct account of Hayek's methodology, therefore, does not eschew either group selection, as Vanberg urges, or methodological individualism, as Hodgson proposes, nor does it treat them as two alternative methods of analysis to be employed separately, as Caldwell suggests. For Hayek, a true explanation of social phenomena requires the full use of both approaches in a mutually complementary fashion. Drawing together these several strands, Hayek's methodology involves the following logical (not chronological) order of explanation:

(1) Multiple competing societies abide by diverse sets of moral/legal rules.
(2) Within each society, these rules spontaneously give rise to diverse orders, exhibiting different properties, or they fail to do so.
(3) These different properties support different rates of replication; some lead to social dissolution. This occurs in various ways: violent conquest, rates of population growth, or, most importantly, intentional or unintentional imitation of more successful cultures.

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(4) Through this process of selection, certain systems of rules spread and overtake alternative systems. Such systems of rules could also lead to mutual influence.
(5) Variation enters the system: mutual influence between two cultures will lead to 'breeding', rules will be unsuccessfully copied by others or imperfectly transmitted to new generations, or innovators will intentionally violate the rules.
(6) A new pool of rule-systems thus emerges, and the process is reiterated *ad infinitum*.

Methodological individualism is Hayek's favoured method of bridging steps (1)–(3), while group selection completes the explanation by bridging steps (3)–(6). For a visual depiction of Hayekian explanation, see Figure 1 below.

Starting with some systems *S* of rules, perhaps 'stumbled upon' as Hayek puts it (Hayek, 1978, p 164), we have a network of relationships. From this network an order *O* emerges (or fails to). In the context of alternative systems that also give rise to orders (or non-orders), *O* bears ramifications for the ability of *S* to proliferate: a society whose rules generate a more successful order *O* will, *ceteris paribus*, successfully compete, *C*, with other societies. That is, their rules will propagate at a quicker rate. This results in a system that, through negative and positive feedbacks *FB*, generates a new population of systems to compete in the next round. Compositive explanations bridge the upper boxes, showing how *S* leads to *O* and what properties, beneficial or harmful, the elements of *O* will exhibit. Cultural evolution explains the process of feedback that occurs as the process 'resets' between *C* and *S* (at the next period).

Crucially, this feedback system involves mutual causation between the levels. *Upward causation* (Section 2.2), studied by applying methodological individualism, occurs as orders spontaneously emerge from agents following rules. *Downward causation* (Section 2.1), on the other hand, occurs as group-level selection pressures shape the rules that agents in the population adhere to. It is in light of this multilevel, bidirectional causation that Hayek asserts the interdependence of mind and society. Our culture shapes our values and constraints; 'reason and civilisation develop in constant mutual interaction' (Hayek, [1967B] 2014, p 339). In recognising multiple levels of selection linked by upward and downward causation, Hayek is a thoroughgoing multilevel selectionist.

A standard issue raised by skeptics of multilevel selection theories is to question the ease with which positive or negative feedbacks at the group level can affect rule adherence at the individual level. In particular, one might object that group-beneficial rules may be genetically maladaptive for the individual. In such a case, we face the free-rider problem; universal adherence will not be an evolutionarily stable strategy, since it is vulnerable to invasion or subversion from within. There are two possible responses

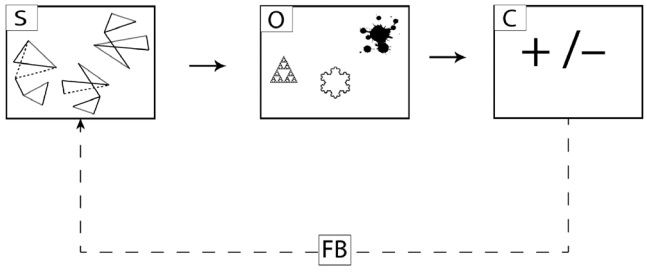

Fig. 1. *Multilevel, bidirectional causation.*

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to this objection. One of these has already been discussed (Section 2.1): under certain conditions, group-level pressures can overcome individual-level ones (Sober and Wilson, 1999, pp 24–5; Okasha, 2006; Turchin, 2011). A second response has been put forward by Luciano Andreozzi (2005), who argues that, in Hayek's theory, group selection is *not* an account of how society stabilises altruistic behaviour. Rather, it is an account of how society selects between stable equilibria. Socially beneficial rules that diminish individual fitness must be enforced by formal or informal institutions.[24] In either case, cooperation can be stabilised and group selection plays a role in determining the social rules accepted and adhered to in equilibrium.

By integrating both upward and downward forms of causation, we arrive at an understanding of Hayek's social theory that incorporates a bidirectional relationship between individual agency and social structure. Understood in this way, Hayek presents what others have called a *transformational model of social order* (C. Lawson 1994; T. Lawson 1994). The significance of this result lies in the fact that several other scholars have drawn the same conclusion about Hayek's social theory, despite approaching his work from completely different angles. Steve Fleetwood (1996) and Jochen Runde (2001), for example, both undertake an analysis of Hayek's social theory in terms of Tony Lawson's distinction between empirical realism and critical realism. In doing so, they both conclude that at the heart of Hayek's theory lies a bidirectional causal relationship between individual agents and social structures. In the context of an entirely distinct inquiry—an inquiry into the significance of emergence in Hayek's work—Paul Lewis (2015) arrives at a strikingly similar conception. Hayek's social theory, Lewis concludes, involves 'the interplay between… two ontologically distinct… causal powers, namely, the social order of actions and the power of people to engage in purposeful, creative decision making' (Lewis, 2015, p 1187; see also p 1171). Despite the diversity of our interpretive approaches, Fleetwood, Runde, Lewis, and I converge to the same basic conclusion: far from being mutually incompatible alternatives, group selection and methodological individualism are complementary, even interdependent, parts of a unified, Hayekian approach to understanding social phenomena.

4. Conclusions

For two explanations to be alternatives they must fully account for the same phenomenon. For a choice between two alternative explanations to be necessary they must be mutually exclusive. Explanations of social phenomena based on methodological individualism and those that employ group selectionist accounts are neither sufficient on their own, nor mutually exclusive. Therefore, the social scientist need not, and Hayek certainly did not, choose between group selection and the invisible hand accounts of the compositive method. Group selection and methodological individualism are fully consistent, and as a result the 'twin ideas' of evolution and spontaneous order can be seen as two aspects of a unified explanatory framework for social phenomenon.

[24] Technically, in a rational actor model, enforcement can stabilise these norms only if we have either infinitely repeated interactions, or if we dispense with subgame perfect equilibrium, relying on mere Nash equilibrium as Binmore (2005: 68–71, 85) does. Andreozzi (2005, pp 237–9) avoids this issue by using replicator dynamics to defend the idea of a cooperative equilibrium with punishers. This relies on assuming simple decision heuristics that defy common knowledge of rationality.

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More contestable is whether or not these two levels of adaptation can maintain the functionality of a modern society. One group of theorists believe that CAS2 adaptations suffice to support, at least, an acceptable social order. Others claim that CAS2 adaptations will lead to group dysfunction without efforts to design institutions so that CAS2 adaptations translate into CAS1 adaptations. Hayek's view may be somewhere in-between. Gene-culture coevolution has endowed human beings with rational capacities and has made them rule-following beings by constitution. Yet, humans' deep genetic past also endows them with atavistic urges that threaten to undermine the foundations of modern society unless cultural evolution can succeed in suppressing these primordial instincts. Thus, unlike the CAS2 theorists, Hayek expresses unease at the thought of weak CAS1 pressures. But unlike many of the CAS1 theorists, Hayek relies on a process of cultural evolution, rather than institutional design, to protect collective functionality. Whether or not the pressures that Hayek invokes for this purpose suffice is a question that merits further investigation.

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