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## The Problem *of* Induction vs the Problem *with* Induction

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Scientists never ‘explain’ any behavior, by theory or by any other hook. Every description that is superseded by a ‘deeper explanation’ turns out upon careful examination to have been replaced by still another description, albeit possibly a more useful description that covers and illuminates a wider area. I can illustrate by what everyone will agree is the single most successful ‘theory’ of all time. I refer to Newton’s theory of universal gravitation.

Paul Samuelson [1964]

All theory depends on assumptions which are not quite true. That is what makes it theory.

Robert Solow [1956]

### Some Background

#### *The Problem of Induction*

Since the time when Adam Smith’s friend David Hume observed that there was no logical justification for the common belief that much of our empirical knowledge was based on inductive proofs [Hume, 1739; Russell, 1945], methodologists and philosophers have been plagued with what they call the ‘Problem of Induction’. The paradigmatic instance of the Problem of Induction is the realization that we cannot provide an inductive proof that ‘the sun will rise tomorrow’. This leads many of us to ask, ‘So *how* do we know that the sun will rise tomorrow?’ If it is impossible to provide a proof, then presumably we would have to admit that we do not know! Several writers have recently claimed to have solved this famous problem [Popper, 1972; Hollis and Nell, 1975] – which is quite surprising, since it is impossible to solve. Nevertheless, what it is and how it is either ‘solved’ or circumvented is fundamental to understanding all contemporary methodological discussions.

Since the Problem of Induction is fundamental, we will need a clear statement of it. Before attempting this, let us clarify some of its elementary parts. First, there is the implicit presumption that empirical knowledge requires logical justification. We will call this 'Justificationism'. Justificationism probably needs little explanation at this stage, since it is widely accepted, but for future reference, let us be specific.

*Justificationism* is the methodological doctrine that asserts that nobody can claim to possess knowledge unless he or she can also demonstrate (with a proof) that his or her knowledge is true; that is, everyone must justify his or her knowledge claims.

Crudely stated, this requirement says, 'knowledge' is not Knowledge unless it is *true* knowledge. Second, there is the further requirement that the justification of empirical (true) knowledge requires an inductive, as opposed to a deductive, proof. We will call this 'Inductivism'. Although Inductivism has been around for several hundred years, our view of it will be the following:

*Inductivism* is the methodological doctrine that asserts that any justification of one's knowledge must be logically based *only* on experiential evidence consisting of particular or singular observation statements; that is, one must justify his or her knowledge using only verifiable observations that have been verified by experience.

Given Inductivism, any straightforward solution to the Problem of Induction requires an 'Inductive logic', that is, there must be a form of logic which permits arguments consisting of only 'singular statements' (e.g., 'The sun rose in Vancouver at 5:28am on the May 16, 1981'), while the conclusions that validly follow may be 'general statements' (e.g., 'The sun will rise every day'). Now we can state the famous problem:

The *Problem of Induction* is that of finding a general *method* of providing an inductive proof for anyone's claim to empirical knowledge.

In other words, this is the problem of finding a form of logical argument in which (a) the conclusion is a *general* statement, such as one of the true 'laws' of economics, or the conclusion is the choice of the true theory or model from among various competitors; and (b) the assumptions include *only* singular statements of *particulars* (such as simple observation reports). With an argument of this form one is said to be arguing inductively from the truth of particulars to the truth of generals.

(On the other hand, a deductive form of argument proceeds from the truth of generals to the truth of particulars.) If one could solve the Problem of Induction, the true 'laws' or general theories of economics (i.e., economic knowledge) could then be said to be induced logically from particular observations.

For very many years virtually everyone believed that science and its 'scientific method' represented a solution to the Problem of Induction [Agassi, 1963]. Their belief was based on the commonly accepted view that Newtonian physics represented *true* knowledge, since there were many reports of the existence of inductive proofs of that knowledge. Late in the nineteenth century, when doubts were raised concerning the absolute truth of Newtonian physics, a more moderate claim for science was developed [e.g., Poincare, 1905/52; Duhem, 1906/62; Eddington, 1928].

#### *The Problem of Induction in economics*

It is interesting to note that except for some recent books explicitly about methodology [Hollis and Nell, 1975; Stewart, 1979; Blaug, 1980; etc.], economics writers have rarely been concerned with this allegedly fundamental problem. There is a very simple reason for this. For most of the nineteenth century, economists simply believed that the Problem of Induction had been solved; thus it did not need any further consideration. After all, Newton seems to claim to have arrived at the laws of physics from scientific observation using inductive methods [e.g., Newton, 1704/1952]. In Adam Smith's time, inductive generalization was the paradigm of rational thinking; Newton's physics was the paradigm of inductive generalization.

Unfortunately, Hume's critical examinations of logical justifications for the acceptance of inductive proofs were largely ignored [Russell, 1945, pp. 659ff.]. Consequently, most thinkers continued to believe that there was an inductive logic. Thus there was no apparent reason to doubt the claims made for the scientific basis of Newton's physics. And there was no reason to doubt the possibility of rational (i.e., inductive) decision-making. Supposedly, whenever one had all the facts, one only needed to be inductively rational to arrive without doubt at correct decisions. Moreover, whenever one made an error in judgement, it would have had to be due to either an irrational moment or a failure to gather all the facts.

Although economic theory has been deeply affected by the eighteenth-century beliefs about rational decision-making, the rationalism of economic theory is not obviously inductivist – with the possible exception of the distinction between 'positive' and 'normative' economics. At least, very little of the faith in rationalism *appears* to have survived as

explicit inductivism. The reason for the absence of explicit inductivism in mainstream economics today is that neoclassical economics reflects the concerns of late nineteenth-century and early twentieth-century philosophers, who were becoming aware of the possibility that Newton's physics might not actually be true and, more important, that inductivism might not be able to live up to its promises.

It can be argued that anyone who believed that Newton's physical laws were true because they had been inductively proven must have been in some way mistaken. Such an argument would lead to two questions: (1) Did Newton fail to prove his theory true because he was mistaken about the objective *quality* of his 'facts'? (2) Was Hume correct about the absence of an adequate inductive logic, so no *quantity* of 'facts' could ever prove Newton's theory true? In response to such questions modern economic methodology falls generally into one of two opposing methodological camps depending on the answers given. On the one hand (for want of a better name), there are the 'conservative' methodologists who would give an affirmative answer to (1) and a negative one to (2) and would promote the importance of the distinction between 'positive' and 'normative' economics. On the other hand, there are the 'liberal' methodologists who would give a negative answer to (1) and an affirmative one to (2) and would find the views of Solow and Samuelson, quoted above, more to their liking.

#### *The problem with induction*

The major point to be stressed here is that both methodological positions are based on Justificationism as well as on some form of Inductivism. And thus, both methodological positions accept the Problem of Induction. They differ only in regard to how the problem *with* induction is recognized.

The 'conservative' methodologists in economics say that there is nothing fundamentally wrong with inductive arguments, with the one possible exception that we must be very careful in the collection of 'facts'. For the 'conservative' methodologists, if there should be a problem with the application of induction in economics or other social sciences, then it is that there are not enough 'hard facts' [e.g., Leontief, 1971]. Specifically, before beginning an inductive proof one must be careful to eliminate subjective or 'normative' opinions about what are the 'facts'. The 'conservative' methodologists thus stress that for economics to be scientific it must be based on 'positive' rather than 'normative' statements.

The 'liberal' methodologists in economics take a position which is less optimistic but more devious. Rather than simply admitting that some theories which were once thought to be true are actually false, the

'liberals' obfuscate the methodological questions by denying that (non-tautological) theories could ever be true. For example, they might argue that only a tautology can be true and a self-contradiction can be false [see further, Quine, 1965].

Theories, according to the 'liberal' methodologists, are to be considered 'better' or 'worse', rather than true or false. The reason for this switch is that the 'liberal' methodologists still think that the Problem of Induction must be solved before one can discuss 'truth' but, to their credit, they recognize that there is a problem with inductive logic. Specifically, they realize that no *finite* quantity of true singular statements could ever prove that any given general statement is true. In short, they admit that there is no inductive logic, and *that* is the problem *with* induction.

#### *The retreat to Conventionalism*

Despite the generous nods given to the positive/normative distinction in many economics textbooks, this popular distinction is nothing but a relic left over from late nineteenth-century attempts to save Inductivism. Since almost all economists have by now accepted that there is a problem with induction, one has to wonder why economics textbooks continue to promote the positive/normative distinction. The reason appears to be quite simple: For methodologists in economics, the Problem of Induction is still not dead!

The most commonly adopted methodological position, in effect, puts Inductivism on a 'back-burner' for the present and temporarily puts a different requirement, 'Conventionalism', in its place along with Justificationism. It will be argued here that, despite the attendant smoke, noise and celebration, the methodological controversies of the early 1960s, were merely family squabbles. That is to say, virtually all economic methodologists bow to the Problem of Induction [possible recent exceptions are Latsis, 1972; Wong, 1973; Newman, 1976; Coddington, 1979]. Since this problem is insolvable without an inductive logic, most methodological arguments in economics today are about the appropriate way to circumvent the Problem of Induction.

Given Conventionalism, it would appear that economists as methodologists do not attempt to solve the Problem of Induction itself but instead try to solve a weaker form of the Problem of Induction. For the purpose of discussing methodology the problem-shift is unfortunate because the modified form of the Problem of Induction, which will be called the 'Problem of Conventions', is a bit more complicated than the original problem. The aim of the original Problem of Induction was a straightforward, objective, inductive proof of the (absolute) truth of any true theory. Contrarily, as we shall see, the aim of the Problem of

Conventions is a choice of the ‘best’ theory according to conventional measures of acceptable ‘truth’. Without an inductive logic, the solution to the Problem of Conventions can get rather complicated (in exactly the same way welfare economics has difficulties with social choices [Boland, 1971a]). To add to the complications, there are many different measures to choose from [Boland, 1971a], and the measure used may or may not involve ‘inductive’ evidence.

### *The Problem of Conventions*

Let us now state the problem which dominates economic methodology today.

The *Problem of Conventions* is the problem of finding generally acceptable criteria upon which to base any contingent, *deductive* proof of any claim to empirical ‘knowledge’.

Note that although the problems of Induction and of Conventions differ regarding the nature of the proof required for justification, they are the same in regard to the requirement of Justificationism. The word ‘knowledge’ has been specifically enclosed in quotation marks because one of the consequences of the presumed Justificationism is that ‘knowledge’ is not (true) Knowledge unless it has been absolutely proven true, and deductive proofs always depend on given assumptions.

Where pure Inductivism requires a final (absolute) inductive proof for any true theory, Conventionalism requires only a *conditional* deductive argument for why the chosen theory is the ‘best’ available. This poses a new problem. Since we assume because we do not know, deductive arguments always have assumptions. Therefore, the choice of any theory is always open to question. That is, one can always question the criteria used to define ‘best’ or ‘better’. Thus, there is always the danger of an infinite regress – for example, by what meta-criteria would we choose the criteria of ‘best’? There is also the danger of circular arguments – for example, the operative criteria are appropriate because they are sufficient to justify our choice. Ultimately, the Problem of Conventions becomes one of providing a justification while at the same time avoiding an infinite regress and a circular justification – and all this is to be done without an inductive logic!

### *Conventionalism vs. Inductivism*

The ‘conservative’ methodologists (those who still do not wish to abandon Inductivism completely) might say that the Problem of Conventions is too precarious and tentative and that we would be better off trying to solve the original Problem of Induction – for example, by

finding a way to establish objective facts [Rotwein, 1980]. The ‘liberal’ methodologists (who deny the possibility of inductive logic) can counter by arguing that any claimed solution to the Problem of Induction is an illusion and that the ‘solution’ is but another instance of the Problem of Conventions. Their reasoning is simple. There are no ‘objective facts’ because all ‘facts’ are ‘theory-laden’ [e.g., Hanson, 1965; Popper, 1972; Samuelson and Scott, 1975; etc.] – that is, any claimed ‘facts’ must have been based on the acceptance of one or more theories. Thus, according to the ‘liberal’ view, any inductive ‘proof’ cannot be complete because every reported ‘fact’ will require a proof too. Hence, we will begin an infinite regress unless we have already accepted ‘conventions’ concerning the ‘truth’ of the ‘facts’. In other words, the most we could ever expect to achieve is a logically consistent, deductive proof based on the prior acceptance of a set of ‘conventions’. In this manner, the ‘liberal’ methodologists can claim that our concern is not whether a theory is *true*, but only whether our argument in its favor is logically *valid*.

The ‘conservative’ methodologists still need not concede defeat. If all facts are theory-laden, our being concerned only with logical validity might mean that our ultimate goal can only be the creation of tautologies. The ‘liberal’ methodologists have handled this possibility with the *ad hoc* prescription that all economic theories and models must at the very least be ‘falsifiable’ or ‘testable’. This prescription does avoid tautologies – but it does so only at the expense of leaving room for the ‘conservative’ methodologists to argue that empirical (i.e., inductive) evidence must play a role. Even though empirical evidence cannot provide a final proof, incomplete induction may be employed in the creation of competing theories or models, leaving deductive arguments for the justification of the choice between them. This view also allows inductive evidence to be involved in the choice criteria used.

We can easily see that this is indeed a family dispute between ‘liberal’ and ‘conservative’ methodologists and that it could probably go on forever, since there never will be the decisive arbiter of final (inductive) proofs. Both positions advocate a form of Conventionalism. Where the ‘liberals’ argue for a pure Conventionalism without any necessary role for inductive evidence (the so-called Hypothetical-Deductive model), the ‘conservatives’ advocate a more modest form of Conventionalism which does not completely abandon Inductivism or the need for some inductive evidence. As long as we continue to presume the necessity of logical justification (i.e., Justificationism) while admitting the impossibility of inductive proofs of general statements, some form of Conventionalism will always be seen to be a ‘better’ methodological position than pure Inductivism (that is, the strict requirement of final

inductive proof). But perversely and more significantly, we must observe that it is seen to be 'better' only if dealing with the Problem of Induction is still considered an important objective.

In some sense the only difference between the 'liberal' and 'conservative' positions is that only the latter holds out for a long-run solution to the Problem of Induction. In the short run – that is, for day-to-day methodological concerns – the positions are identical. Both positions require that the Problem of Conventions be solved in the short run. The 'conservative' methodologists thus have two viewpoints. They adopt Conventionalism in the short run and hold out for Inductivism in the long run. Given their schizophrenia, discussing methodology in economics is often rather difficult because it is not always clear which viewpoint is operative. For the remainder of the book, except where specifically noted, we will identify Conventionalism with the short-run viewpoint so that we do not have to distinguish between the 'conservative' and 'liberal' positions.

### Conventionalism in Economics

#### *The effects of Conventionalism*

For our purposes it is unfortunate that the term 'Conventionalism' has been promoted as a pejorative one by the philosopher Karl Popper and his followers. Many can rightfully object to the apparent name-calling that is implied by the use of such terms as 'Conventionalist', 'Inductivist', 'Instrumentalist', and the like. Few philosophers today would promote themselves as Conventionalists. But more important, in economics it is very difficult to find anyone who exactly fits one of the molds delineated by Popper. Nevertheless, Popper's methodological categorization does serve an heuristic purpose. Despite the possible entertainment value, we do not wish to label individuals with peculiar philosophical tastes. Our only concern here will be the identification of impersonal items on the impersonal hidden agenda of neoclassical economics.

Our argument here is that the first item on the hidden agenda of any neoclassical article is the Problem of Induction. The agenda item usually appears, however, in its weaker, modified form, as the Problem of Conventions.

When we say that any particular problem is on the hidden agenda of a given article we are saying either that one of the objectives of the article is to solve that problem or that it is presumed to have been solved already and that what appears in any given neoclassical article will be consistent with the presumed solution. Since the solution of the Problem of Conventions (and, hence, a circumvention of the Problem of Induc-

tion) is taken for granted, it might be difficult to find direct evidence of its presence. However, two clues to its presence can be identified.

First and foremost is the absence of references to any theory being either true or false. The reason for this lacuna is that, *given Conventionalism*, if one were to refer to a theory being true, then it would imply that one has solved the Problem of Induction and thus has the ability to prove the theory's truth. But this would be inconsistent, as Conventionalism is predicated on a denial of the possibility of solving the Problem of Induction. So, strictly speaking, Conventionalism precludes any references to truth or falsity.

The conventionalist ban on the use of the terms 'true' and 'false' would present obvious difficulties even for simple discussions. It would also complicate the use of other terms such as 'knowing' and 'knowledge', as well as 'explaining' and 'explanation'. The reason for the ban on the use of the words 'knowledge' and 'explanation' is somewhat elusive. It seems to be due to a variation of the presumption of Justificationism, that to know is to have obtained 'true knowledge' and, similarly, 'to explain' is to give a 'true explanation'.

Although the ban on using the terms 'true' and 'false' in their literal sense is rather complete, the terms 'knowledge' and 'explanation' do appear often in the literature. What needs to be understood, however, is that there is a presumption that whenever the term 'explanation' is used one never means literally true explanation. Instead, an 'explanation' only means a 'true' explanation *relative* to some accepted conventional measures of 'approximation' [Samuelson, 1952; 1964; Simon, 1979].

Consider, for example, the old debates over the theory of imperfect competition [Archibald, 1961; Stigler, 1963]. Some argue that the concept of imperfect competition is empty or arbitrary and unduly complex. Simplicity would be served by merely applying perfect competition or monopoly where appropriate [Friedman, 1953]. The dispute thus becomes one of 'which is a better approximation' – a simplifying approximation which gives more positive results, or a generalizing approximation which allows for a better description of what firms actually do? This dispute will not be resolved without an accepted criterion of approximation [Boland, 1970b; 1971a].

The second clue to the presence of Conventionalism is the apparent concern for making a choice among competing theories or models [e.g., Tarascio and Caldwell, 1979; cf. Boland, 1971a]. As mentioned above, most methodological articles and debates have been about the criteria to be used in any 'theory choice'. There is virtually no discussion of *why* one should ever be required to choose *one* theory! The reason for the lack of discussion of the motivation for 'theory choice' is that the Problem of Conventions is simply taken for granted. A direct

consequence of accepting the need to solve the Problem of Conventions is the presumption that any article or essay must represent a revealed choice of a theory and that any such choice *can* be justified. The only question of methodological interest in this case concerns how to reveal the criteria used to justify the theory choice.

#### *Conventionalism and 'theory choice' criteria*

Given the Problem of Conventions, most questions of methodology reduce to what amount to exercises in economic analysis. Specifically, any choice of a theory or model can be 'explained' as being the result of a maximization process in which the objective function is an accepted measure of 'truthlikeness' and the constraint is the set of available alternative theories or models. To choose the best theory is to choose the one which maximizes some desired attribute. Over the last forty years, several different criteria or objective functions have been mentioned. The most well-defined have been 'simplicity', 'generality', 'verifiability', 'falsifiability', 'confirmability', and 'testability'. Less well-defined are 'empirical relevance', 'plausibility' and 'reasonableness'.

Each of these criteria has its advocates and its critics. Those advocates who wish to remain consistent with the dictates of Conventionalism will not claim that their explanation of the choice of any particular theory in any way constitutes a proof that the theory is actually true. If by chance the chosen theory is 'best' by all criteria, there could never be an argument. But usually competing theories are best by one criterion and not by another, and in such cases critics, who may also wish to remain consistent with Conventionalism, are thus forced to quibble over a choice between criteria [e.g., Samuelson, 1967; Lucas, 1980; cf. Boland, 1970b].

#### *Limitations of choice criteria*

Those critics who are not bound by the dictates of Conventionalism can take a different approach. One line of criticism [e.g., Boland, 1980] is to reject Conventionalism by arguing that each criterion is based on an allegedly absolutely *true* theory of the nature of any true theory of the phenomena in question. For example, choosing a theory which is the 'most simple' presumes that the real world is inherently simple, thus any true theory of the real world must also be simple, and that furthermore, although the truth of one's theory may not be provable, the simplicity of competing theories can be established if the measure of simplicity is well defined. A similar argument can be raised against the version of Conventionalism which judges theories on the basis of the criterion of generality.

Advocates of any Conventionalist criterion might wish to deny that

they have assumed that their theory of the world is true, since such an assumption violates the requirements of Conventionalism. But, if the advocacy of a particular criterion is not based on the presumed true theory of the essential nature of the world which the theory 'explains', then the use of the criterion either leads to an infinite regress or opens the choice to a charge of arbitrariness. Specifically, one can always question the choice of the choice criterion. If a true theory of the world is not presumed, then we are right back at the doorstep of the Problem of Induction.

Conventionalist criteria other than simplicity or generality would seem to be less vulnerable. Unfortunately, there are still problems. One of the first Conventionalist criteria was verifiability, but that criterion is no longer taken seriously, as it has not fared well against the logical criticism of Popper and others who argue that all informative, non-tautological theories are unverifiable [Popper, 1934/59]. For Popper, theories are informative only if they are falsifiable. He seems successfully to have destroyed the belief in verification, as falsifiability and testability are now widely accepted as a minimum condition for the acceptability of any theory or model in economics [*pace* Hutchison, 1938 and Samuelson, 1948]. This is unfortunate, as 'theory choice' criteria, falsifiability and testability are still quite arbitrary. But worse, those critics *not* bound by Conventionalism can also argue that the true theory may not be the most falsifiable nor the most testable of the available alternative theories [Wisdom, 1963; Bartley, 1968].

#### *Validation, confirmations and disconfirmations*

For some purists, the acceptance of the criteria of verifiability or falsifiability might seem a little inconsistent if one still accepts Conventionalism and its denial of a (non-tautological and non-self-contradictory) theory being either true or false. If a theory cannot be false, what does 'falsifiable' mean? These purists find refuge in a set of weaker criteria for the lesser purpose of 'validation' [Stewart, 1979]. The most widely used criterion is 'confirmability', and rather than seeking to verify a theory or model we are said to be only seeking its confirmation. For example, the universal statement 'All swans are white' may be said to be confirmed (but not proven) when a very large number of 'white swans' have been observed in the absence of any 'non-white swans'. Those who accept Popper's criticism of the purpose for verification may opt for the criterion of 'testability' where the objective is to select only theories which in principle could be 'disconfirmed' [Hempel, 1966, ch. 4].

Unfortunately, such validation criteria have their limitations, too. For example, a highly confirmed theory may still be false. But purists can counter with the observation that this is not a problem, since any theory

which does not violate the axioms of logic (i.e., one which is logically consistent) cannot be considered false even in the presence of a reported refutation (an observed counter-example) because any refuting fact is itself theory-laden – that is, any proponent of the ‘refuted’ theory can defend it by questioning the alleged truth of the observed counter-example [cf. Agassi, 1966a]. This example highlights one of the prominent features of logically consistent Conventionalism. In place of the concepts of ‘true’ and ‘false’, Conventionalism uses ‘valid’ and ‘invalid’. And furthermore, the only *objective* and non-arbitrary test to be applied to theories or models is that of logical consistency and validity. Even if we cannot prove a theory or model is true, at the very minimum to be true it must be logically consistent.

The concept of confirmation is not without its logical problems, too. In its simple form it equates a probability of truth with a degree of confirmation. Following Hume, some might claim that although objective inductive proofs may be impossible, it is still possible to argue inductively, and the outcome of such an argument will be a ‘degree of probability of truth’. Such a ‘degree’ concept presumes that a greater quantity of positive evidence implies a higher degree of probability of truth. Unfortunately, with this simple concept one has merely assumed what one wished to establish [Boland, 1980].

Recall that an inductive argument proceeds from particular positive statements – e.g., observation reports such as ‘A white swan was observed in British Columbia today’ – to general statements such as ‘All swans in BC today are white.’ In the absence of refuting observations, the general statement’s probability of truth is measured by the ratio of the number of confirming observations to the unknown but finite number of possible observations – such as the ratio of observed white swans (without double-counting) to the number of all swans in BC today. So long as we specify which day ‘today’ is, this general statement is both verifiable and refutable. (Note that what Popper objected to was the verification of strictly universal statements where the quantity of possible observations were not finite.)

The only question of empirical significance here is whether subsequent observations of confirming evidence (e.g., more white swans) *necessarily* increase the degree of confidence in the general statement *as opposed to its denial* (e.g., the statement that there is at least one non-white swan in BC today). Based on the quantity of evidence available, what degree of confidence does one have that the *next* swan observed will be white? Advocates of the confirmability criterion would have us believe that each past observation of a white swan necessarily increases the probability that all future swans observed will be white. This alleged necessity is actually based on a prior, and unsupported, assumption that

the general statement is true (or that its ultimate probability is one).

Since the criterion of confirmability is so widely used in econometrics, perhaps we should offer an explanation for our claim. If you think the general statement ‘All swans in BC today are white’ is *false*, your confidence in the *denial* will also be increased by the observation of each *white* swan. In other words, the probability that the next swan observed will be non-white (hence proving the falsity of the general statement in question) will increase as each white swan is observed (and tagged to avoid double-counting); that is, the ratio of the number of as yet unobserved non-white swans to the number of all unobserved swans increases as each white swan is counted. Thus, we think we can conclude that the significance of one’s confirmations is based solely on one’s *prior* assumptions. You will see confirming evidence for your empirical generalizations only because you have already assumed that they are true!

It must be realized that not all advocates of confirmation rely on a probability construct. But avoiding any reliance on probability will not circumvent the more well-known logical problems of confirmation. All conceptions of a logical connection between positive evidence and degrees of confirmation suffer from a profound logical problem called, by some philosophers, the ‘paradox of confirmation’ [see Gardiner, 1976].

The philosopher’s paradox of confirmation merely points out that any evidence which does not refute a theory consisting of a simple universal statement (for example, ‘All swans are white’) must increase the degree of confirmation. The paradox is based on the observation that this example of a simple universal statement is equivalent to the statement ‘All non-white things are non-swans.’ Positive evidence consistent with the latter statement would have to include red shoes as well as black ravens, since in both cases we have non-white things which are not swans. But even worse, the set of all confirming instances must include all things which are not non-white swans. This merely divides the contents of the universe into non-white swans and everything else [Agassi, 1966b; Hempel, 1966].

### The Remnants of Inductivism

For the most part neoclassical economics has ignored the alleged problems with conventional choice criteria. Today, almost all econometric hypothesis testing involves the use of one or more of the criteria discussed above. And, among methodologists there is still considerable discussion of falsifiability as a minimum condition for the

acceptability of any theory or model. So one might wish to conclude that Conventionalism has completely supplanted Inductivism in economics. Such a conclusion would be somewhat mistaken, as there still remain many remnants of the vanquished Inductivism!

The most popular remnant is the alleged hierarchy which consists of 'hypotheses', 'theories' and 'laws'. In the tradition of Inductivism, every science was developed in stages. Each supposedly began with an 'hypothesis' which had been previously formed only by examining empirical data. The next step was the submission of the hypothesis to experimental testing. If the hypothesis passed the test, it was to be elevated in status to a 'theory'. Eventually, if it somehow reached the ultimate status, it was crowned a 'law'. It is difficult to take such a view seriously these days. Nevertheless, one still finds distinctions being made as if there were some significant difference among hypotheses, theories and laws. And related to this is a ban on speculations – 'one must not jump to conclusions until the facts are examined.' If Inductivism were actually completely abandoned, it would be difficult to see any reason for the continued promotion of the hierarchy or for a ban on conjectures and speculations.

Even if methodologists today avoid promoting the hierarchical distinctions of Inductivism, the dominant methodological perspective is that the fundamental problem facing all economists is one of choosing the one 'best' theory or model. It is this choice problem which is the primary remnant of Inductivism and the related presumption that we must deal with the Problem of Induction.

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## The Explanatory Problem of Individualism

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For theory it is irrelevant *why* people demand certain goods: the only important point is that all things are demanded, produced, and paid for because individuals want them. Every demand on the market is therefore an individualistic one, altho, from another point of view, it often is an altruistic or a social one.

The only wants which for the purpose of economic theory should be called strictly social are *those which are consciously asserted by the whole community...*

Many writers call production, distribution, and exchange social processes, meaning thereby that nobody can perform them – at least the two last named – by himself. In this sense, prices are obviously social phenomena....

We seem to be faced by this alternative: either we are to assume social utility curves, – in which case society must be the sole owner of capital and land, the society is communistic, and no rent or interest will be paid to individuals; or rent and interest are paid, in which case there are no social values, but only individual ones, and society as such does not control production....

Joseph Schumpeter [1909]

All human conduct is psychological and, from that standpoint, not only the study of economics but the study of every other branch of human activity is a psychological study and the facts of all such branches are psychological facts. ...The principles of an economic psychology ... can be *deduced* only from facts.... A very general view of common well-known facts gave English writers the concept of a 'final degree of utility,' and Walras the concept of 'rarity'.... From the examination of the facts we were led, by induction, to formulate those notions....

Vilfredo Pareto [1916/35]



individualistic atoms of the rare gas in my balloon are not isolated from the other atoms. Adam Smith, who is almost as well known for his discussion of the division of labor and the resulting efficiency purchased at the price of interdependence, was well aware of that. What he would have stressed was that the contacts between the atoms were *organized* by the use of markets and prices.

Paul Samuelson [1963/66, p. 1411]

### Individualism as a Research Program

#### *Individualism vs. holism*

Methodological individualism, the research program outlined by Schumpeter, has recently been identified by Mark Blaug as the ‘view that social theories must be grounded in the attitudes and behavior of individuals, as opposed to “methodological holism”, which asserts that social theories must be grounded in the behavior of irreducible groups of individuals’ [1980, p. 266]. The view that neoclassical economics is firmly grounded on a research program of ‘methodological individualism’ is today rather commonplace [e.g., Samuelson, 1963/66; Albert, 1979]. In our terms, methodological individualism is the second main item on the hidden agenda of neoclassical economics. For future reference, let us specify:

*Methodological individualism* is the view that allows *only* individuals to be the decision-makers in any explanation of social phenomena.

Methodological individualism does not allow explanations which involve non-individualist decision-makers such as institutions, weather or even historical destiny.

From the viewpoint of methodology, we need to examine the reasons why methodological individualism is a main item on the neoclassical agenda. Unfortunately, the reasons are difficult to find, as there is little methodological discussion of why economics *should* involve only explanations that can be reduced to the decision-making of individuals – except, perhaps, for Hayek’s arguments for the informational simplicity of methodological individualism [1937/48; 1945/48]. Our task in this chapter is to provide a rudimentary examination of the nature and purpose of methodological individualism in neoclassical theory. Along the way we will review some recent developments in the understanding of this agenda item.

An examination of the reasons for the presence of methodological

individualism on the agenda is more complicated than it might at first appear. Supposedly [e.g., Schumpeter, 1909; Blaug, 1980], there is a built-in dichotomy which allows only two options – methodological individualism vs. methodological holism. Given the individualism-holism dichotomy, the reasons for promoting methodological individualism may be rather negative. The social-philosophical basis of neo-classical economics is dominated by the eighteenth-century anti-authoritarian rationalism that puts the individual decision-maker at the center of the social universe. A rejection of individualism would be tantamount to the advocacy of a denial of intellectual freedom. For intellectual reasons, we would need to promote the view that individuals are free to decide their own fate in order to avoid endorsing authoritarianism. For political reasons, it would seem we have to favor individualism in order to avoid inadvertently advocating any ideology based on ‘holism’ – e.g., communism, socialism, Marxism, etc.

Adding to the confusions caused by the acceptance of the (possibly false) dichotomy between individualism and holism, there is the confusion raised by the alternative view of individualism promoted by Popper in his *Open Society*. Specifically, there is his version of ‘methodological individualism’ [Popper, 1945/66, p. 91], which does not accept the individualism-holism dichotomy and thus is apparently more general than the individualism defined by Schumpeter (and Blaug). In Popper’s terms, Schumpeter’s ‘methodological individualism’ should be called ‘psychologistic individualism’ and Blaug’s ‘methodological holism’ should be called ‘institutional holism’, while Popper’s ‘methodological individualism’ should be called ‘institutional individualism’ [Agassi, 1960; 1975]. Unfortunately, this approach only adds a second dichotomy – psychologism vs. institutionalism. It does not automatically give us an explanation for the advocacy of individualism.

In order to explain why neoclassical economics is based on methodological individualism, one can, of course, point to obvious questions of ideology [cf. Weisskopf, 1979] but as an explanation this only begs the question at a different level. If the decision to adopt methodological individualism is based on ideological considerations, how do individual economists choose their ideologies? Must our explanation of the choice of ideologies be constrained by the prescriptions of methodological individualism? To what must the explanation of the choice of ideologies be reduced? To avoid an infinite regress, it cannot be an ideology.

#### *Individualism and explanations*

Pareto’s candid comments (quoted above) suggest a very different approach: one that connects psychology with induction. This approach will be examined in the remainder of this chapter. We shall argue that

there is a close connection between the Problem of Induction and the research program of methodological individualism. Specifically, for neoclassical economics, methodological individualism is a research program that is designed to facilitate a *long-run* solution to the Problem of Induction.

To examine the relationship between Inductivism and individualism in neoclassical theory, we need to consider another aspect of Pareto's comments. What Pareto, and John Stuart Mill before him, presumed was that there are rules of explanation that prescribe the existence of an irreducible set of acceptable 'primitives'. Since the time of Mill, most economists have accepted the view that for individualism to be the basis of all explanations in social theory, the irreducible minimum must be the given psychological states of the decision-makers [see also Scitovsky, 1976]. Today we might simply say that the psychological states of all individuals are *exogenous*, but Popper sees something more in the view of Mill, which he calls 'psychologism' [1945/66, ch. 14]. We must be careful here to distinguish psychologism from individualism, as it is possible to form a psychologistic methodology which is 'holistic' and with which, for example, explanations are reduced to 'mob psychology' or 'class interest'. For reference we shall define the more general methodological principle as follows:

*Psychologism* is the methodological prescription that psychological states are the *only* exogenous variables permitted beyond natural givens (e.g., weather, contents of the Universe, etc.)

And we shall always use Agassi's term 'psychologistic individualism' to identify the Mill-Pareto prescription as a special form of methodological individualism. Specifically,

*Psychologistic individualism* is the version of psychologism which identifies the individual with his or her psychological state.

We should note immediately that the implications of adhering to a psychologistic individualist version of neoclassical theory means that everything or every variable which cannot be reduced either to someone's psychological state or to a natural given must be explained somewhere in the theory. We should also note that a theory can conform to methodological individualism without conforming to psychologistic individualism only if the requirements of psychologism are abandoned.

#### *Reductive individualism*

In light of the proscription of non-individualist and non-natural exogenous variables, the key methodological obstacle for neoclassical theories

of economic behavior is the specification of an appropriate conception of the relationship between institutions and individuals. On the one hand, social institutions are consequences of decisions made by one or more individuals. On the other hand, individual decision-makers are constrained by existing institutions. If any given institution is the result of actions of individuals, can it ever be an exogenous variable? That is, can institutions really be constraints? If institutions limit the range of choices facing any individual, are the individual's choices really free? If any institution is a creation of groups of individuals, can it have aims of its own or must it merely be a reflection of the aims of the individuals who created it?

These questions are not often discussed in the economics literature because the psychologism of Mill or Pareto is simply taken for granted. Thus, whenever anyone feels bound by methodological individualism, he or she is immediately bound also by the psychologistic individualism. As a result, in any economics explanation in which institutions are recognized, they are always to be treated as mere epiphenomena. That is, institutions are to be analogous to pictures printed in the newspaper. What appears in any newspaper picture as a person's face is actually only a collection of black and white dots. One can explain the appearance of a face by explaining why the dots are where they are.

The explanatory obstacle posed by the existence of institutions exists regardless of the prescriptions of psychologism. Methodological individualism alone leads to two primary methodological requirements. First, no institution can be left unexplained and, moreover, every institution must be explained in individualist terms. Second, any conceived institution must be responsive to the choices of every individual. The first requirement begs a fundamental methodological question about what constitutes a successful explanation. Is there a set of automatically acceptable givens? The second raises the thorny question considered in Arrow's (Im)Possibility Theorem. Can the choice of an institution be rationalized in the same manner as we rationalize an individual's choice of a bundle of goods? If it can, then the social utility (welfare) function used to make the social choice must also be a social institution – one which, like the picture on the newspaper page, must be an epiphenomenon. Either the social choice is nothing more than the logical consequence of individual choices, or the social utility function must be perfectly responsive to changes in any individual's utility function.

Now, it is commonly accepted that all explanations require some givens – i.e., some exogenous variables. In a fundamental way, specification of the exogenous variables is probably the most informative theoretical assertion in any theoretical model [Boland, 1975]. The various competing schools of economics might easily be characterized

on the basis of which variables are considered exogenous. Marxian models take ‘class interest’ and ‘rates of accumulation’ as exogenous givens. Some institutional models take the evolution of social institutions as a given and use it to explain the history of economics. Many neoclassical models would instead attempt to explain ‘rates of accumulation’ and ‘institutions’ [Boland, 1979b], and it is conceivable that some might even try to explain ‘class interest’ as an outcome of rational decision-making. Whatever the case, no one model can explain everything; there must be some givens. For neoclassical economics today what the presumption of psychologism does is conveniently to restrict the list of acceptable givens. Given psychologicistic individualism, the psychological states of the individuals in society are the irreducible givens.

The methodological view that there is but one permissible set of exogenous variables to which all successful explanations must be reduced is called ‘reductionism’. Popper’s methodological individualism has been specifically identified by Blaug as an example of a reductionist research program. Supposedly, theorists who are bound by reductive methodological individualism are obligated to explain away any non-individualistic variable which might appear to be exogenous, or any ‘macroeconomic propositions that cannot be reduced to microeconomic ones’ [p. 51]. Blaug recommends giving up methodological individualism rather than macroeconomics. We suspect that he has only psychologicistic individualism in mind, since, contrary to what Blaug says, Popper’s methodological individualism does not have to be a reductionist program; only the special version, psychologicistic individualism, does. In Popper’s version of methodological individualism – institutional individualism – individuals are not identified with psychological states but rather with their unique problem-situations. With his institutional individualism, the decision-maker is considered a problem-solver with specific aims which may not be psychologically motivated [Agassi, 1960; 1975].

### **Institutional Individualism**

The conception of methodological individualism as a reductionist program can be somewhat misleading. It might not always be clear what constitutes a permissible individualistic exogenous variable. In any psychologicistic individualist version of neoclassical theory, what constitutes the individualistic variable is easy to see: it is the individuals’ psychological states. Specifically, individuals are always identified with their utility functions (as firms are often implicitly identified with their production functions [cf. Rowcroft, 1979]).

Viewing psychology as the foundation of all economics explanations

raises some subtle questions and dilemmas. Would a psychological basis for all economics explanations imply that everyone will make the same choice when facing the same given price-income situation, or will there never be two individuals doing the same thing? The first option seems to deny individuality and free will, and the second is rather unrealistic. (Some may argue that the latter is not unrealistic since in the real world there is only a finite set of choice options which eliminates the possibility of complete individuality.)

In order to understand the methodological role of individualism we need to consider a key question: is it possible to construct an individualistic explanation which is not psychologicistic? Or, similarly, is it possible to be in favor of individualism while at the same time being against psychologism? To answer these questions we need first to examine the nature of psychologism, then we will be able to consider Popper’s alternative form of methodological individualism which denies psychologism.

### *Psychologism*

Psychologism is primarily a basis for explaining the behavior of both individuals and social institutions and as such it can too easily be made a part of a specification of the second main item on the neoclassical hidden agenda. Along these lines, psychologism might be considered a mere arbitrary reductionist program in that it may only provide the minimum conditions for the acceptability of any given theory. Although it does make methodological individualism a reductionist program and it does specify an acceptable set of exogenous variables – only psychological states and natural constraints are to be allowed – this narrow conception of psychologism as a convenient methodological tool would seem to us to be a bit superficial. Reliance on psychologism is more than a methodological ploy to solve the Problem of Conventions because psychologism implicitly involves a specific theory of society and the individual.

The basis of psychologism is a theory that there is something which all individuals have in common. The common element is sometimes called ‘Human Nature’. The accepted view of what constitutes Human Nature has changed considerably over the last two hundred years. Today, it is merely asserted that all individuals are governed by the same ‘laws’ of psychology. In its simplest form psychologism would have us believe that any two individuals facing exactly the same situation would behave in exactly the same way. With simple psychologism, whenever two people are behaving differently, they must be facing different situations. In this light it would appear that, as a program of explanation, simple psychologism is very versatile; it can serve as the basis for Freudian psychoanalysis [Popper, 1945/66, ch. 25], for anthropological

explanations of the differences between primitive tribes [Jarvie, 1964], and even for economics [Stigler and Becker, 1976].

Although psychologism would seem to be a straightforward specification of methodological individualism, in its simple form, surprisingly, it actually precludes individuality! Methodologically speaking, simple psychologism allows differences between the choices of individuals to be explained only in terms of the differences between the nature-given situations facing the two individuals. All individuals are, in effect, identical. Obviously, simple psychologism does beg an important philosophical question. If everyone were governed by the same psychological 'laws', what would be the basis of individuality?<sup>1</sup>

It is interesting to note that even though neoclassical theories are usually based on psychologism, they seem to have overcome this last question by being able to have it both ways. (However, they do so by stopping short of complete reduction.) Consider demand theory. Individuality is preserved by saying that individuals can have any utility function they wish. However, psychologism is also preserved by saying that all individuals' utility functions do have one common feature. Every utility function exhibits a negatively sloped marginal utility curve.<sup>2</sup> Although the slopes of their respective marginal curves must all be negative, the individual utility functions differ in that there is an unlimited number of possible (negative) magnitudes for the slopes of their marginal curves. Thus it would seem that there is wide scope for individuality, yet the essential commonality for the purposes of psychological economic theory is still provided. Again, it is the combination of universal constraints (natural givens) and psychological differences that is the basis of neoclassical explanations constructed in accordance with psychologism. However, one might wonder whether psychologism is actually a necessary element in neoclassical theory. We shall argue that it is not.

Psychologism is very versatile. In the short run it satisfies the needs of Conventionalism in that it provides at least one criterion for the acceptability of alternative theories or models in terms of the prescription of acceptable exogenous variables. In the longer-run perspective of Pareto or Mill it also focuses on one source of atomistic facts in order to imitate inductive science. It is unlikely that anyone ascribes to this longer-run perspective anymore. Instead, we shall argue that psychologism is retained because it is a part of the Conventionalist program to deal with the Problem of Induction.

#### *Sophisticated psychologism*

As long as neoclassical economics is based on a reductive methodological individualism, some form of psychologism must be retained to stop a possible infinite regress. But, as we explained above, there is a

problem with simple psychologism, as it seems to deny individuality in order to satisfy the methodological needs of reductionism. That neoclassical economics is an intellectually impressive solution to the problem of simple psychologism is not widely recognized. Instead, those who recognize that there is a problem with simple psychologism can opt for a more sophisticated form of psychologism.

The most common sophisticated alternative to simple psychologism merely denies the uniformity of Human Nature and instead claims that there are different types of people. Thus, when two individuals face the same situation but respond differently, one could explain the difference as the result of the two individuals being of different psychological types. Sometimes people will be said to have different 'mentalities', which amounts to the same thing.

This form of psychologism is probably the most widely accepted today. It is used to explain all sorts of happenings. There are supposedly many different types of individual. For example, there are 'criminal mentalities', 'extroverts', 'introverts', 'artistic types', 'mathematical minds', and so on. The methodological basis of Thomas Kuhn's famous book *The Structure of Scientific Revolutions* relies on a form of sophisticated psychologism. Kuhn presumes that the reason why the structure of science is different from other disciplines is that scientists have a different mentality [1971, pp. 143ff.].

Unfortunately, sophisticated psychologism, while allowing for individuality, opens the door to an infinite regress. Instead of asserting the existence of a Human Nature consisting of a uniform psychological type (e.g., a set of needs shared by everyone), sophisticated psychologism asserts a set of possible categories of types. One of the more sophisticated forms says that there is a hierarchy of needs and that people differ only because they rank them differently [e.g., Maslow, 1954]. Given a finite number of needs, there would then be a finite (but larger) number of possible rankings to use to explain differences between individuals. For example, if there were three human needs, then there would be six possible rankings and hence six different types of individuals.

The key issue concerning the existence of Human Nature is whether or not there is something uniformly attributable to all individuals. If we try to avoid simple psychologism by saying there are many different psychological types, then to complete a reductive use of psychologism we would have to explain why people are of different psychological types. This immediately leads to an infinite regress which can be stopped only by asserting the existence of some deeper uniform attribute of Human Nature. In other words, a reductive methodological individualism based on psychologism can only lead to some form of simple psychologism. Otherwise, it is completely arbitrary.

### *Institutions and the aims of individuals*

We mentioned earlier that the key question for the explanatory problem of methodological individualism is the explanatory relationship between institutions and individual decision-makers. This is also the key question for distinguishing the individualism usually presumed in neoclassical theory from the version which Popper offered in his book *The Open Society and its Enemies*. The relationship between Popper's version of individualism and other forms, as well as the relationship between individualism and holism, was developed by his student Joseph Agassi [1960, 1975]. In order to understand the nature of psychologism, the Popper-Agassi alternative view will be presented in this section.

The central feature of psychologistic individualism is its insistence that only individuals can have aims and that aims are considered psychological states. Popper and Agassi reject the identification of aims and psychological states. Individuals do have aims, but they need not be psychologically given. Aims may be changed, yet at any point in time they may still be givens. If any individual treats an institution as a constraint, then institutions must be included in the set of permissible exogenous variables. Thus, Popper and Agassi reject the limitation on acceptable exogenous variables. Institutions are to be included among the explanatory variables along with the aims of individuals. It is for this reason that Popper's alternative is called 'institutional individualism'. Unlike psychologistic individualism, institutional individualism is not necessarily a reductionist research program. The existence of given institutions in any explanation is not a threat to its individualism. Institutions are still the creations of individuals – e.g., creations of past decisions of individuals – yet, for the purpose of real-time decision-making, some institutions have to be considered as given [Newman, 1976, 1981].

To some observers, institutional individualism may appear to be either a paradox or an impossibility. But such a perception might only betray their belief in the reductionist version of individualism. Nevertheless, there is something missing. How can a minimally satisfactory Popper-Agassi explanation consider institutions as givens and yet consider them to be creations of individual decision-makers? Neither Popper nor Agassi has answered this question.

For students of Marshall's neoclassical economics, however, the answer to this question is rather simple. The overlooked element is 'time'. In any particular real-time situation, institutions are included in the list of 'givens' simply because any one individual decision-maker cannot change all of them [Newman, 1981]. In fact, in many cases it is easier for individuals to change their aims than to alter some of their givens. In some cases it is simply not possible to change some of the givens. In

other cases, the individuals have chosen not to change some of them. In other words, the exogeneity of some givens may be a matter of the decision-maker's choice. No two individuals may choose to face the same situation. Even if they did, they may choose to have different aims. Stating this in terms more consistent with neoclassical economics, there is no reason to consider psychological states as givens, since sometimes they, too, may be a matter of choice.

### **Individualism as an Explanatory Problem**

Institutional individualism is an interesting perspective for the study of neoclassical research programs for the following reasons. On the one hand, institutional individualism can be a way of dealing with the explanatory problem of methodological individualism without having to endorse psychologism. On the other hand, psychologism is not a *necessary* attribute of neoclassical theory. Specifically, if we strip away the psychologism that is traditionally presumed in neoclassical economics, we will find an approach to explanation that comes very close to that promoted by Alfred Marshall in his *Principles*. In Marshall's short run, virtually all variables but the quantities of labor and output are fixed and given. In the longer run, more things are variable (and, thus, subject to choice), but there are still some things, such as 'social conditions' or the 'character' of some individuals, that take generations to change [Marshall, 1926/64, p. 315, and Book VI] – we might even say that things that are 'fixed' are merely things which take an infinity of time to change [Hicks, 1979]. It is unfortunate that his optimistic Victorian view that even personal character was not immutable was lost somewhere along the way. This raises an interesting methodological question: why has psychologism – which has its origins in Hume's Romantic accommodation of the Problem of Induction – been able to survive even the overwhelming dominance of Marshall's Victorian economics?

### *Explanation and rational decision-making*

The reason why psychologism survives is that it is supported by the common presumption that rationality is a psychological process. This presumption, in turn, has a tradition based on a belief that Hume was able to overcome the Problem of Induction [see Popper, 1972, ch. 1]. It is also supported by the older view that rational decision-making must in some way involve inductive rationality.

As Popper explains, Hume's 'solution' to the Problem of Induction (and the 'problem with induction') is to say that although there is no objective inductive rationality, there is a subjective one which allows

people to think inductively. In other words, people do things in their heads which they cannot do on paper. This psychologistic view of rationality led to a long history of attempts to understand the psychological processes of knowing and learning.

Surprisingly, this psychologistic view of rationality is even accepted by the many critics of the use of the assumption of rational decision-making in economics [e.g., Shackle, 1972; Simon, 1979]. These critics do not deny the psychologistic view of rationality; instead they deny the possibility of collecting sufficient facts to acquire inductively the knowledge necessary to make a rational decision. In other words, they do not deny Inductivism, only the feasibility of inductive knowledge. This leads them to argue that neoclassical economics is wrong in assuming that individuals are maximizers, since the supposedly needed inductive knowledge of the successful decision-maker is a practical impossibility. If one were to deny Inductivism, then their critiques lose their force [see Boland, 1981b].

How can one explain behavior on the basis of rational decision-making without endorsing or presuming either Inductivism or a psychologistic view of rationality? This is a problem which has not been dealt with in economics, but it will have to be if economists are going to avoid the criticisms of Simon and Shackle or give Popper's views more than a superficial gloss.

The view that rationality is a psychological process is a relic of the late eighteenth century. Even today, it is still commonplace to distinguish humans from other animals on the basis that humans can be rational. Thus any criticism of a psychologistic view of rationality might be considered dangerous. Nevertheless, the psychologistic view is based on a simple mistake. It confuses one's *argument* in favor of an individual's decision with the *process* of making the decision. It also confuses being rational with being reasonable – the latter only implies the willingness to provide reasons for one's actions. The reasons may not always be adequate.

The case against psychologistic rationality is rather straightforward. Simply stated, humans cannot be rational – only arguments can be rational. An argument is rational only if it is not logically inconsistent (i.e., only if it does not violate the axioms of logic [see Boland, 1979a]). But, most important, whether an argument is rational can be decided independently of the process of its creation or the psychological state of its creator. Since there is no inductive logic, our knowledge of the process of creating a theoretical argument cannot provide the argument with logical validity if it is one which is otherwise invalid. Popper puts it quite simply, 'what is true in logic is true in psychology' [Popper, 1972, p. 6]. Psychologistic rationality cannot be more than what is provided by

logical arguments. Thus, any discussion of rational decision-making need not involve psychology. So we ask again, why is psychologism still commonly accepted?

#### *Psychologism and induction in the long run*

There is one important reason why the adherence to both psychologism and Inductivism never presents a problem in neoclassical economics. It is simply that neoclassical models liberally use long-run analysis. A reductive psychologistic individualist explanation is successful *only if* all non-individualistic exogenous variables can be made endogenous (i.e., explained), leaving only natural constraints or psychological states (i.e., individuals). In neoclassical economics, a variable is endogenous only if it can be shown to be the consequence of a maximizing choice. If a variable is an externally fixed constraint, it cannot be a matter of choice. Thus, a minimum requirement for maximization is that the object of choice be representable as a variable point on a continuum [Lancaster, 1966]. This would mean that all short-run constraints which are neither natural nor psychological givens must eventually be explained. If one allows sufficient time, then everything can be changed. Thus, it is easy to see that in the long run – when everything (except the permitted exogenous variables) is variable and thus subject to maximizing choice decisions – reductive psychologistic individualism is at least possible.

The same claim could have been made for induction. If we allow a sufficiently long time, perhaps all the facts needed for an inductive proof might be found. We must remember, though, that whenever 'a sufficiently long time' really means an infinity of time, we are dealing with an impossibility. One way to say some task is impossible is to say that it would take an infinity of time to complete it. Conversely, if we do not mean an infinity of time, then it is an open question whether all the facts have been provided or whether no counter-facts exist anywhere. In other words, in the long run the Problem of Induction is non-existent.

#### **Individualism as an Agenda Item**

We can now attempt to explain why individualism is an item on the hidden agenda of neoclassical economics. The explanation we will give is that individualism is on the agenda because it has been viewed as a means of providing the basis for a long-run inductive research program. Perhaps it may be possible to identify other reasons for being in favor of an individualist theory of society but, it will be argued, they only add support. This is to say, it is possible to be in favor of an individualist society without advocating an Inductivist view of explanations – but

without Inductivism the individualist view may seem rather weak.

It would appear, then, that Blaug was correct in identifying the methodological individualism of neoclassical economics as a reductionist research program. However, reductive methodological individualism is inherent not in neoclassical theory but only in the aims of individual neoclassical theorists. In effect, neoclassical theory is an institution which has its own aims – namely, to demonstrate that it is possible to view society as the consequence of decisions made only by individuals. It does not necessarily have the same aims of some neoclassical theorists – for example, of those who wish to show that society is the consequence of decisions which logically follow only from the psychological states of individual decision-makers and that there is no need for holistic ideologies.

Attempting to explain the nature of neoclassical theory as that of an institution raises all of the questions we have been discussing in this chapter. For our explanation of neoclassical economics to be correct, must we argue that neoclassical economics is an epiphenomenon reflecting only what individual economists do, or are we allowed to argue that neoclassical economics has a life of its own, which is independent of what particular economists do? We see immediately, then, that the explanation we are offering still may not satisfy those who only accept reductive (i.e., psychological) individualist explanations.

#### *Individualism as Inductivism*

When explaining why individualism is on the agenda of neoclassical economics, we must be careful to distinguish between the general research program of any neoclassical theory and the specific research program of individual neoclassical theorists. Since our primary concern in this book is to understand the methodology of neoclassical economics, we should only be concerned with the specification of neoclassical research programs. So how do we accommodate the specific aims of individual economists? Was Jacob Viner correct when he (supposedly) said, ‘Economics is what economists do’?

Can economics be something other than exactly what contemporary economists do? If we are limited to a reductive individualist explanation of the institution of neoclassical economics, then we would have to agree with Viner. Furthermore, it would seem, if we wish to learn anything about neoclassical economics we will have to form our conclusions only from specific examples of what economists do. That is to say, reductive individualist explanations can only be inductive explanations.

A reductive individualist explanation of the nature of neoclassical economics (such as Viner’s) raises certain questions. If we find some

‘economist’ who is not behaving as other economists do, must we question whether that person really is an economist? How do we decide? Which came first, the nature of neoclassical economics or the behavior of neoclassical individual economists? Such questions arise whenever one is bound by the reductive individualist research program. One could instead choose to explain institutions according to that which is allowed by a non-reductive program such as institutional individualism. Given that neoclassical economics existed before most of today’s neoclassical economists were born, it would be possible to argue that neoclassical economics continues to follow reductive individualism only because today’s economists choose to accept such a hidden agenda as their exogenous guide. (Perhaps this is because no individual neoclassical economist could ever hope to change the *hidden* agenda in his or her lifetime.) In this sense, neoclassical economics is an exogenous element whenever the individual economist is choosing a specific research program.

The only thing at issue, then, is whether reductive individualism is an *essential* element of neoclassical methodology. To decide this we would need to determine whether or not the conclusions of today’s neoclassical economics require reductive individualism. If the conclusion of any neoclassical article can be shown to be independent of any reductive individualism – e.g., it may presume the existence of exogenous non-individualistic variables other than natural constraints – then we will have to conclude that reductive individualism is not essential. For now we will leave this question open (alternatively, see Newman [1981]).

Now we assert, perhaps perversely, that the methodological individualist agenda item of neoclassical economics is, as Blaug claims, a reductionist version. However – and this is where we are perverse – the reason why it is a reductionist version is not because neoclassical economists or neoclassical economics are essentially Inductivist but only because economists have not endeavored to purge the unnecessary Inductivist and reductionist elements in neoclassical economics. In other words, neoclassical economics is based on reductive methodological individualism by default.

This view only raises another question. Why have economists not purged the reductive individualism and instead adopted the more modest individualism which Marshall was promoting (which simply accepts short-run non-individualist and non-natural constraints such as the amount of physical capital)? The answer to this question is the key to our argument here. Reductive individualism has not been purged because it is thought to be the means of providing the ‘atoms’ or minimal facts from which one is to ‘induce’ the ‘laws of economics’. Supposedly, if one knew the utility functions of all individual consumers in society and

the production functions of all individual firms in society then, given only the natural constraints (e.g., resource endowments), we could derive (and thus explain) all prices, quantities, and institutions. Few neoclassical economists would disagree with such a supposition. However, they might admit that obtaining all the necessary knowledge is a virtual impossibility. But again, this admission may only reflect a belief in the necessity of induction. In short, neoclassical economics today is based on reductive individualism because economists have not yet chosen to reject the need to deal with the Problem of Induction.

### *Psychologism and Conventionalism*

As we have argued above, economists not only accept the reductive individualist research program, but they compound this when they also accept psychologism by the identification of individuals with their respective utility functions, that is, with their respective psychological states. We argue that since individualism is too often presumed only for the philosophical purposes of dealing with the Problem of Induction, we need to examine the role psychologism plays in the individualist agenda item.

Again we have to be perverse. On the one hand, psychologism is accepted because it facilitates a reductive individualist research program to deal with the Problem of Induction. On the other hand, psychologism is also accepted as an arbitrary means of solving the Problem of Conventions, as we explained in Chapter 1. It may seem that psychologism is being used to solve contradictory problems, since Conventionalism is considered an alternative to Inductivism. But there is no contradiction here. Conventionalism is based on Inductivism in the following sense. Conventionalism accepts the impossibility of an inductive proof of the truth of any theory. Another way of stating this is that Conventionalism accepts that an inductive proof would require an infinity of time to complete. Thus, in the short run, Conventionalism attempts to establish rules of acceptance for choosing between competing theories. Invoking psychologism provides one of the rules of acceptance, namely, that the allowable exogenous variables in any acceptable theory must not include any givens other than the natural givens and the psychological states of the individuals. Other variables may be temporarily fixed (e.g., institutional constraints) but not exogenous. That is, it must be possible to explain them, in principle, by allowing for an artificial passage of time. But true to Conventionalist principles, any choice based on an hypothetical passage of time cannot be construed as a proof.

This point needs to be stressed in order to understand the role of psychologism. As explained in the last section, if we were to allow for

an infinity of time, induction might not be impossible. If we were to allow for an infinity of time, then all artificial, non-individualist constraints could be relaxed so that the only exogenous givens would be individualist variables. In other words, in the very long run both Inductivism and psychologism would be feasible. However, no one could claim that a long-run argument constitutes an *inductive* proof. Rather, what is provided by long-run arguments (which are consistent with psychologism and Inductivism) is only a demonstration of the hypothetical possibility of an inductive proof and a complete reduction to psychological states. In other words, fixed non-individualist constraints are allowable in the short run only if it can be demonstrated that it is the *natural* shortness of the run which alone explains their fixity. Such a demonstration is provided by every long-run model.

To a great extent, then, given that Conventionalism does not allow proofs of absolute truth, psychologism would seem to be a successful, albeit arbitrary, means of solving the Problem of Conventions. By legislating psychological states as the only accepted set of non-natural exogenous variables, we are allowing conditional explanations to avoid the infinite regression that would seem to be required of an absolutely true explanation. By taking psychologism and Conventionalism as methodological givens, we are never expected to explain the individual's psychological state.

### **Footnotes to Chapter 2**

- 1 At first the possibility of two identical situations would seem unlikely, but what about identical twins? Surely we could test the plausibility of simple psychologism by examining the behavior of identical twins. Could we use identical twins to test whether an individual's psychological make-up is truly exogenous – that is, not influenced by non-psychological, environmental factors? For many years it was believed that the exogeneity of psychology had been established using identical twins. Specifically, it was claimed that identical twins are bound to be identical in everything, including psychological make-up. Thus, if a pair of twins were separated at birth but were later reunited and given the same test (e.g., for IQ) they would score the same despite having lived separately in different environments. Supposedly, this had even been established by extensive scientific analysis. As it turned out, the evidence had been falsified [Kamin, 1974; Hearnshaw, 1979]. Of course, psychologism would never fail this test, since advocates could always explain away differences as being the results of the practical problem of actually presenting the identical twins with exactly the same test situation. So a test of simple psychologism now seems impossible.
- 2 Or any logically equivalent not based on calculus concepts.



## PART II

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*METHODOLOGY IN NEOCLASSICAL ECONOMIC  
THEORY*

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