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COPING WITH INCONSISTENCIES: Examples from the Social Sciences*

Abstract. In this paper we present two case studies on inconsistencies in the social sciences. The first is devoted to sociologist George Caspar Homans and his exchange theory. We argue that his account of how he arrived at his theory is highly misleading, because it ignores the inconsistencies he had to cope with. In the second case study we analyse how John Maynard Keynes coped with the inconsistency between classical economic theory and real economic conditions in developing his path-breaking theory.

1. Introduction

George Homans reacted against Emile Durkheim and other proponents of the so-called *social-facts paradigm* (Claude Lévi-Strauss, Robert Merton, Talcott Parsons, . . .). Adherents of this paradigm consider a social fact explained if one has found the social facts that cause it. For Homans social explanation is inevitably psychological: it has to refer to the behaviour of individual human beings. In Section 2 we present the core of Homans' exchange theory,

*The research for this paper benefited from a bilateral scientific exchange project funded by the Ministry of the Flemish Community (project BIL01/80) and the Polish State Committee for Scientific Research. We thank Cecilia Adrogué, Ricardo Crespo, Daniel Heymann, Robrecht Vanderbeeken and Maciej Witek for their comments on earlier drafts of this paper. Jeroen Van Bouwel is a post-doctoral fellow of the Fund for Scientific Research – Flanders.

which is the elaboration of this basic idea. In Section 3 we show that his account of the genesis of this theory is highly misleading: it ignores all the inconsistencies he had to deal with.

According to John Kenneth Galbraith, revolutions in economics always result from the emergence of specific economic problems. Whether this generalisation is true or not, it is certainly the case for the development of Keynesian macroeconomics. According to classical economics (with its key figures Adam Smith, David Ricardo, Jean Baptiste Say) a permanent depression is impossible. The worldwide Great Depression of 1929 and the following years, from which no part of the world recovered quickly, proved that the classicists were wrong. This inconsistency between economic theory and real economic conditions was the starting point of John Maynard Keynes. In Section 4 we will explain the basic inconsistency in more detail. In Section 5 we will show how Keynes dealt with it. In Section 6 we will argue that Keynes' line of reasoning is analogous to what important scientists in other disciplines have done when confronted with similar inconsistencies.

2. Homans' exchange theory

In the autobiographical sketch in Ritzer 1992 (pp. 426–427) Homans claims that the most central intellectual problem of sociology is to explain how social structures can arise from and be maintained by individual actions. He also gives his view on explanation, which is deductive-nomological: to explain is to derive the explanandum from more general propositions by means of certain initial conditions.

If we combine these two ideas, we can understand how Homans worked. In order to explain a specific social structure, he looked for relevant initial conditions. The specific historical data are combined with general propositions, which he takes from behavioural psychology. The specific data and general propositions explain how people act, and the social structure is the aggregate outcome of these actions. For instance, if he explains the introduction of power-driven machines in the textile industry he assumes that entrepreneurs were interested in increased profits (initial condition) and combines this with general propositions of the sort described below. This explains what entrepreneurs buy (actions), and the ubiquity of power-driven machines (social structure) is the aggregate result of these actions.

What were the general propositions that Homans had in mind? As already mentioned, they were behaviouristic in nature. Here are the most fundamental ones:

Success Proposition

For all actions taken by persons, the more often a particular action of a person is rewarded, the more likely the person is to perform that action. Homans 1974, p. 16

Stimulus Proposition

If in the past the occurrence of a particular stimulus, or set of stimuli, has been the occasion on which a person's action has been rewarded, then the more similar the present stimuli are to the past ones, the more likely the person is to perform the action, or some similar action.

Homans 1974, pp. 22–23

These propositions are behaviouristic in the sense that they describe how the effects of past actions determine present actions.

In principle, propositions of this type are sufficient for giving the deductive bottom-up explanations of social structures that Homans has in mind, because they describe how people react to given situations. However, he also has the following proposition:

Rationality Proposition

In choosing between alternative actions, a person will choose that one for which, as perceived by him at the time, the value, V , of the result, multiplied by the probability, p , of getting the result, is the greater.

Homans, p. 43

This proposition, if combined with suitable auxiliary hypotheses, explains the behaviouristic propositions. The auxiliary hypotheses are:

- (1) The perceived probability of success is influenced by past success.
- (2) The perceived probability of success is influenced by the similarity of the present situation to past successful situations.

Each of these auxiliary hypotheses describes a cause that co-determines perceived probability. The first auxiliary hypothesis together with the *Rationality Proposition* explains the *Success Proposition*. The second auxiliary hypothesis together with the *Rationality Proposition* explains the *Stimulus Proposition* (see Homans 1974, pp. 44–45).

Homans' theory contains more auxiliary hypotheses, for instance:

Deprivation-Satiation Proposition

The more often in the recent past a person has received a particular reward, the less valuable any further unit of that reward becomes for him. Homans, p. 29

This proposition describes how values (the second input, besides perceived probability, mentioned in the *Rationality Proposition*) are determined.

The general outline of Homans' theory can be summarised as follows: the general propositions that function in bottom-up explanations of social facts are behaviouristic; the *Rationality Proposition* is combined with auxiliary hypotheses about perceived probabilities and about values in order to explain some of these behaviouristic propositions.

3. Homans' account of where exchange theory comes from

In Homans' view, exchange theory resulted from adapting behavioural psychology and elementary economics in a certain way, and fusing the results of these operations:

As the two sets of propositions, behavioral psychology and elementary economics, are stretched in these respective directions, they seem to me to mesh with one another and to form a single set[.]

Homans 1961, pp. 12–13

In 3.1–3.3 we will show that Homans not only had to stretch but also had to cripple elementary economics and behavioural psychology in order to arrive at his theory. In our analysis, we will use a part of the conceptual apparatus developed in Elster 1989.

3.1.The stretching of elementary economics is described by Homans as follows:

Indeed we are out to rehabilitate the “economic man.” The trouble with him was not that he was economic, that he used his resources to some advantage, but that he was antisocial and materialistic, interested only in money and material goods and ready to sacrifice even his old mother to get them. What was wrong with him was his values: he was only allowed a limited range of values; but the new economic man is not so limited.

Homans 1961, p. 79

The important word is ‘value’: economics is stretched by giving up restrictions on one of the inputs of rational choice. Homans assumes that altruistic and non-materialistic values can be quantified. This is highly debatable, but if it is possible, his ‘stretched economics’ is much more powerful than traditional economics: it can predict and explain the behaviour of people with non-materialistic and/or altruistic values.

Alas for Homans' nice story, there are two more differences between the old and the new economic man. A traditional assumption of economics is

that economic agents try to maximise expected utility *in the long run*. There is not only calculation, but also *foresight* (calculation for the long run) as opposed to *myopia* (calculation for the short run; cf. Elster 1989, pp. 42–44). Homans is aware that elementary economics regards myopic behaviour as irrational and rules it out:

The second meaning of rationality is a little different. Whatever a person's values may be, his behavior is irrational if it is not so calculated as to get him the largest supply of these values in the long run. Here the emphasis is not on the kind of value being pursued—it may be capital gains or eternal salvation—but on the way it is being pursued: the emphasis is on calculation and the long run—the longer the better.

Homans 1961, p. 80

Homans does explicitly admit that his new economic man can be irrational in this sense. He does not assume that people are focussed on the long term:

Although calculation for the long run plays its part in human affairs, we make no allowance for it in our propositions, which are to this extent incomplete. We do not rule it out; neither do we rule it in.

Homans 1961, p. 81

We call this ‘crippling’ of elementary economics because a basic characteristic of the *procedure* by which men are supposed to make decisions is given up: in the new economics, people can be partially or completely myopic. The consequences are far-reaching: once we drop the assumption of foresight, we cannot predict anymore how people will behave, except in cases where short term and long term calculations lead to the same advice. Leaving open the possibility of myopia destroys the predictive and explanatory power of economics almost completely.

There is a second difference, which is not explicitly mentioned by Homans. It can be clarified by means of Jon Elster's conception of rationality:

An action, to be rational, must be the final result of three optimal decisions. First, it must be the best means of realizing a person's desire, given his beliefs. Next, these beliefs must themselves be optimal, given the evidence available to him. Finally, the person must collect an optimal amount of evidence—neither too much nor too little. That amount depends both on his desires—on the importance he attaches to the decision—and on his beliefs about the costs and benefits of gathering information.

Elster 1989, p. 30

Economics traditionally assumes that people act rationally in the strong sense of Elster: economic agents are supposed to have expectations that

coincide with the values given by the best economic models. They are supposed to have perfect information, and to process this information without making errors.

It is obvious that the beliefs of such a strongly rational economic agent cannot be influenced by his own private past success, nor by similarities: strongly rational economic agents rely on general economic models, not on their own experience. So they will not act in accordance with the *Success Proposition* or the *Stimulus Proposition*. This means that, if Homans wants to hold on to these propositions (which he obviously does) he has to give up the assumption of strong rationality: only Elster's first condition (which is equivalent to Homans' *Rationality Proposition*) can be retained.

3.2. Homans calls his propositions psychological because they are about individual human beings:

They are propositions about the behavior of individual human beings, rather than propositions about groups or societies as such; and the behavior of men, as men, is generally considered the province of psychology. Homans 1967, p. 40

Homans is a methodological individualist: he is convinced that propositions about the behaviour of individual human beings are necessary and sufficient for explaining (changes in) social structure. In his view, the propositions at the individual level are sufficient because social structure is the aggregate result of the actions of individuals: there is no emergence. He considers these propositions to be necessary because, in his view, explanations have to give causes and causes can only be found at the micro-level: social structures do not cause other causal structures (see e.g. Homans 1967, p. 60). We do not agree with this view (see Weber & Van Bouwel 2002 and Van Bouwel & Weber 2002 for arguments). However, it is not Homans' methodological individualism that matters here. What matters is the way he wants to sell it to his audience: he presents it as a natural extension of Skinner's behaviourism. Homans claims that he adapted Skinner to his own needs:

What the position assumes is that the general propositions of psychology, which are propositions about the effects on human behavior of the results thereof, do not change when the results come from other men rather than from the physical environment. Homans 1967, p. 59

Moreover, he claims that the propositions remain valid when the reinforcement is mutual rather than one-sided (situations in which two actors can reward and punish each other's behaviour). Like in the case of elementary

economics, Homans claims that he is stretching behavioural psychology beyond its artificial limits.

However, there is also some crippling to be done. Homans' *Rationality Proposition* presupposes beliefs and desires, the theoretical entities of folk psychology that radical behaviourists like Skinner want to eliminate. So Homans adopts one of the central theses of behaviourism (the reinforcement thesis) while abandoning its crucial methodological tenet: the dispensability of the assumption that humans have an "inner core" with desires, beliefs and other propositional attitudes.

3.3. What can we conclude from all this? First, Homans' claim that exchange theory partly results from stretching traditional economics, is window-dressing: he gives up all substantial assumptions except weak rationality. But this principle is very wide-spread. For instance, Blaise Pascal assumes weak rationality in his prudential arguments for believing in God: in his view, we have to look at the consequences of believing and not believing (see Weber 1998 for details). Homans' *Rationality Proposition* can be seen as the result of stretching Pascal's ideas beyond their original (theological) borders. Undoubtedly, one can find many theories in philosophy and the social sciences that, if stretched, result in the *Rationality Proposition*. So the claim that exchange theory results from stretching traditional economics is rather non-committal: according to Paul Simon's famous song, there are fifty ways to leave your lover; maybe there are less than fifty ways to arrive at the *Rationality Proposition*, but stretching traditional economics is certainly not the only one.

Second, Homans' claim that exchange theory partly results from stretching behavioural psychology is also very misleading: radical behaviourism has two central tenets, and he dropped one of them. Another way to formulate this, is: Homans kept the empirical laws of behaviourism, but gave them a theoretical explanation, based on minimal rationality, that is unacceptable for a traditional behaviourist.

In the literature on belief change (see e.g. Gärdenfors 1988), it is common to distinguish three types of change; expansion, contraction and revision. We *expand* a given set of beliefs Γ with A (a statement or (consistent) set of statements) by simply adding A to Γ . We *contract* Γ with A by removing A from Γ . We *revise* Γ with A by adding A to Γ and subsequently removing other statements from Γ in order to make the resulting set of beliefs consistent. Homans presents the genesis of his theory as a simple act of belief expansion: add elementary economics (set of statements A) to behavioural

psychology (Γ). The real story is more complicated: there is a contraction operation on elementary economics, and the result of this contraction is the A with which behavioural psychology is revised or expanded in an unsound way. (Some behaviourist deny that men have the “inner core” that Homans assumes; they would consider his theory a revision of behavioural psychology; other behaviourist accept that there is an inner core, but refuse to use it; in their view, Homans’ theory is an unsound expansion of behavioural psychology, one that violates the methodological tenet of the dispensability of the inner core).

Some readers may have noticed that our story on Homans’ account of the genesis of his theory was based on the first edition of his book. There is a good reason for that: in the second edition (which contains a much better articulated version of his theory) all passages referring to the genesis of the theory have disappeared. Maybe Homans realised that the story was completely unconvincing (the passages about the origin of the theory occur in different chapters of the first edition; it is probably not a coincidence that exactly these passages have been removed). The second edition does not contain an alternative story of where the theory is supposed to come from.

4. Keynes’ problem

Let us now turn to our second case study. As mentioned in the introduction of this paper, the starting point of John Maynard Keynes was an inconsistency between economic theory and real economic conditions. The economic problems that emerged during the Great Depression from 1929 onwards, questioned the validity of the classical account of economic thought. One of these economic problems was mass unemployment. According to the classical approach in those days, anyone able and willing to work could do so at the ruling market-clearing equilibrium real wage rate given a perfectly competitive labour market. So, some short-term temporary unemployment may occur as the real wage rate adjusts to its new market-clearing level following a change in demand or supply conditions in the labour market, but besides this source of unemployment, the only other source, according to the classical approach, is *voluntary unemployment* (when people capable of working, choose not to work or choose not to accept a lower wage). So, classical economists explained the mass unemployment of the 1930s by claiming that the real wage rate was kept too high. Cutting wages to their market-clearing level would restore full employment. But, the fact of a permanent mass underemployment, did question the classical account, as the theory pre-

dicted a swift modification of the labour market determined by supply and demand for labour. The high and permanent underemployment rates did falsify this classical scenario of automatic self-correcting mechanisms and merely temporary distortions of the employment equilibrium. Here, economic theory was refuted by the economic reality of the Great Depression, and economists had to find a theory that could explain the permanent underemployment. In the words of Roger Backhouse:

Though the underlying causes of the period's economic instability remained controversial, it became clear to most economists that the dominant theories of the pre-war period were inadequate to explain what was going on. Most important, it became clear that it was necessary to be able to offer a coherent theory of the level of economic activity. Changes in the level of industrial production and unemployment, on both which statistics were beginning to be calculated during the 1920s, had become too important to be regarded as a secondary phenomenon.

Backhouse 2002, p. 215

5. Keynes' solution

5.1. How did Keynes cope with the inconsistency between the economic theory and the real economic conditions? His own view is:

I shall argue that the postulates of the classical theory are applicable to a special case only and not to the general case, the situation which it assumes being a limiting point of the possible position of equilibrium. Moreover, the characteristics of the special case assumed by the classical theory happen not to be those of the economic society in which we actually live, with the result that its teaching is misleading and disastrous if we attempt to apply it to the facts of experience.

Keynes 1973, p. 3

Developing his general theory in *The General Theory of Employment, Interest and Money* and providing a good explanation for the mass unemployment of the 1930s, Keynes modified the idea of classical theory on aggregate demand. The classical account on this topic was Say's law, according to which there could be no general shortage of aggregate demand. Keynes, on the opposite, argued that there could be a deficiency of aggregate demand in the goods market, and that this deficiency was the cause for the mass (involuntary) unemployment (hence, the cause was looked for outside the labour market).

In order to restore full employment government intervention was required to increase aggregate demand. Without the government intervention the economy settles into an enduring equilibrium of underemployment and low performance—so that this, not full employment and vigorous growth, becomes the norm. This theoretical conclusion differs strongly from the classical *laissez-faire* claims. According to Keynes, the recipe of the classics in case of unemployment, namely cutting wages, would not raise employment unless doing so raised the level of aggregate demand:

It is not very plausible to assert that unemployment in the United States in 1932 was due either to labour obstinately refusing to accept a reduction of money-wages or to its obstinately demanding a real wage beyond what the productivity of the economic machine was capable of furnishing.
Keynes 1973, p. 9

5.2. Before putting Keynes' way of reasoning in a more general perspective (Section 6) we would like to make some remarks concerning Keynes' own presentation of the way in which he solved the problems of classical theory.

Firstly, Keynes' work was indeed very successful in overturning the teachings of the classical economists, as he could claim that they were not relevant for economic problems of the times which people lived:

Following the Great Depression of the early 1930s, Keynes's arguments sounded very convincing, especially as he claimed to have found a theory for dealing with the problem of persistent unemployment.
Ahiakpor 1998, p. xi

But, Keynes' way of dealing with the classics and early neo-classical economists is far from uncontroversial. For instance, Ahiakpor writes

Keynes's arguments in the General Theory are built on gross misrepresentations of classical theories, couched in definitions that are very different from the meaning of terms as used by the classics or generally understood in the language of the marketplace.
Ahiakpor 1998, p. xi

So it is unclear up to which extent we can accept Keynes' assessment of the classical approach.

Secondly, we might raise some questions about Keynes' claims as if his theory is more general, and the classic account a special case of Keynes' theory. Is this more than a rhetoric trick? Keynes does depart significantly from the classical and neo-classical (Lakatosian) 'hard-core':

Equilibrium for the economy as a whole now involved ‘underemployment equilibrium’ and the introduction of this conjunction, an apparent contradiction in terms, involved a profound change in the ‘hard core’ of nineteenth-century economics, which undoubtedly included the faith that competitive forces drive an economy towards a steady-state of full employment. Furthermore, the classical and neoclassical ‘hard core’ had always contained the idea of rational economic calculation involving the existence of certainty-equivalents for each uncertain future outcome of current decisions. Keynes introduced pervasive uncertainty and the possibility of destabilising expectations, not just in the ‘protective belt’ but in the ‘hard core’ of his programme. The Keynesian ‘hard core’, therefore, really is a new ‘hard core’ in economics.

Blaug 1976, p. 162

If this is correct, it is unclear how the classical account can be adjusted in order to make it fit as a special case in the general theory.

Given these two remarks some doubts might be raised about the claim that the classical account could be considered a special case of Keynes’ theory (cf. *supra*, 1973, p. 3).

6. Family resemblances

The “special case trick” that Keynes applied is well known from other cases in the history of science. An example from a completely different area and discipline can be found in geocentric astronomy. The ontology of geocentric astronomers consists basically of claims:

- (G_A) The Earth is located in a sphere (the Stellar Sphere) to which the fixed stars are attached.
- (G_B) Besides the Earth, the Stellar Sphere contains seven celestial bodies that are called planets (Greek for wanderers) because they *seem to* move in an irregular way. These planets are: Moon, Sun, Mercury, Venus, Mars, Jupiter en Saturn.

In the third century B.C, the astronomer Apollonius developed a theory which could predict the motion of the stars and the planets by means of the following laws:

- (G₁) The Earth is stationary: it does not participate in any locomotion.
- (G₂) The Earth is located at the centre of the Stellar Sphere.
- (G₃) The Stellar Sphere rotates at constant speed around the earth.

- (G₄) The motion of planets is *epicyclic*: they are located at the circumference of a circle (called the *epicycle*) whose centre D also makes a circular motion around some centre (the latter circle is called the *deferent*).
- (G₅) The Earth is the centre of the deferents of all planets.
- (G₆) The two circular motions are uniform: the centres of the epicycles move at constant speed around the Earth, and the planets move at constant speed around the centre of their epicycle.

For each planet, Apollonius calculated a value of the two radii and of the two angular speeds of motion. In this way, he could explain retrograde motion and could account for the fact that planets appear brighter at some times than at others. However, there were some unsolvable problems, e.g. the fact that the Sun looks larger at noon in the (Greek/Northern) winter than in summer. This and other problems were solved in the second century B.C. by Hipparchus of Nicaea, who introduced *eccentric motion*. His theory contains the ontological claims G_A and G_B, and all laws except G₅ and G₆ are conserved. G₅ is replaced by:

- (G'₅) For each planet there is a point E, the *eccentric*, which is the centre of its deferent. This centre is not necessarily the Earth.

The double uniformity idea of G₆ is retained, but the formulation must be adapted as a consequence of the shift from G₅ to G'₅. The new formulation is:

- (G'₆) The two circular motions are uniform: the centres of the epicycles move at constant speed around the eccentric E, and the planets move at constant speed around the centre of their epicycle.

From the point of view of the new theory, the old one describes a special case; a universe were the eccentrics of all planets coincide with the centre of the universe (the Earth). Unfortunately for the old theory, the real universe does not satisfy this restriction.

The similarity with Keynes, who claims that the real economy does not satisfy the restrictions of classical economics, is obvious. What the scientists do is try to find a principle in the old theory that can be relaxed in such a way that the problem (the inconsistency) disappears.

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