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Philosophy of the Social Sciences: Lectures

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Lecture 1: **EXPLANATION I**

The Challenge

Many philosophers, in particular Karl Popper, have argued that scientific explanations must be deductive. Logically, that means that scientific explanations must make reference to universal statements or 'laws'. Ontologically and epistemologically it means that the objects of scientific knowledge must be law governed. But that surely means that the idea of 'social scientific explanation' is dubious.

Summary

1. Introduction

2. Popper: covering law model:

Universal Law L	L + C1...n: Explanans
Initial Conditions C1 C2 ... Cn	
Event E occurs.	E: Explanandum

An explanation is a *set of statements*
The conclusion (explanandum) is *deduced* from the premisses (explanans)
The premisses *predict* the conclusion.

Scientific laws are *strictly universal*: eg 'of all scientific harmonic oscillators it is true that their energy never falls below hv/2'
Compare with: 'of all human beings now living on earth it is true that their height never exceeds 4 metres' – *numerically universal*, or, a species of *singular statement*.

3. Hempel:
deductive nomological model:

Condition 1 ... n	C + L = explanans
Law(s) 1 ... n	
⊨ (entails) Event E	E = explanandum

inductive probabilistic, or probabilistic statistical model:

Fi	(in instance i (the case) factors F were realised)	F + P = explanans
P	(probability of E given F is very high)	
├ (implies) Ei (the event)		E = explanandum

4. Criticisms of Hempel:

4.1. Calculation is not explanation (the flagpole);
4.2. Prediction is not explanation (the barometer);
4.3. Contingent relations are not explanations (the birth control pill);
4.4. Probability 'explains' with equal success both what does and what does not happen

5. What is a 'law'?
   J S Mill's argument.
   Laws as causal
   Laws as descriptive
   Laws as prescriptive

6. Weber's criticism:
   'The more general the laws, the less they can contribute to the causal imputation of individual phenomena';
   'Knowledge of social laws is not knowledge of social reality, but one of the various aids used by our minds for attaining this end.

Key concepts

Explanation

In the lectures that follow we are going to meet a number of rival analyses of the concept of explanation – tied to different theories of explanation. At a minimum though we can note at this point several things about the concept.

1) for some physical event like my car not starting there are a number of 'levels' of explanation –
   - the phenomenological level that is familiar to competent but non-technical drivers – spark plugs, fuel injection systems, engine temperatures etc;
   - b) the more technical explanation that a physicist or chemist would understand but ordinary drivers would not;
   - c) the explanation sketches that one would offer to a small child or to the completely uninitiated – the car's gone wrong and it won't go; or John broke it;
2) whatever level one works at, the elements of an explanation are ordered in such a way that conditions (explananda) lead up to the event, phenomenon or state of affairs to be explained (explanandum). There are philosophical questions about the exact nature of these relationships: logical, epistemological, metaphysical. ....
3) but also an important element of explanation is the interpretation of the explanandum in such a way as to bring it into an explanatory relation with the explanans, and vice versa.

Deductive

Deductive logic is the study of what it is for propositions to follow from premisses. Formal logic systematises rules for this:

- modus ponens, the principle licensing inference from a conditional plus its antecedent to its consequent [A, if A then B] |= [B].
- modus tollens, the 'denying principle': [if A then B, not B] |= [¬A]
- a valid argument schema: Every X is a Y and a Z;
  No Y is a W;
  Therefore no X is a W.
- logically valid (purely by virtue of its form): If p and q then p

Law governed

- Some smokers die of lung cancer; some do not. But underlying the contingency and uncertainty there does seem to be order and regularity – the world runs according to laws and rules. It seems to be 'nomic'. A problem that immediately arises with the concept of law is whether it is *prescriptive* or just *descriptive.*

- If we ask why drivers in this country drive on the left hand side of the road (even in the absence of explicit signs telling them to do so, or barriers etc forcing them to do so) we will answer that it is because the laws of the state include the law that we drive on the left. Our actions are prescribed by those laws; even the actions of law breakers are governed by those laws – if you drive on the right you are liable to sanction; furthermore the actions of lawbreakers, lawbenders, law violators, law ignorers and so on similarly cannot really be characterised apart from by reference to the law. Is this also the case for phyical laws?
- Do we want to say that the apple falls from the tree because the laws of nature constrain it to do so? or that if the leaf does not fall straight to the ground but floats that is because it is not wholly constrained by gravity although the laws of gravity are certainly operating but rather is subject to the cross cutting pressures of the the wind (ie laws of thermodynamics)? Or do we simply want to say that the 'laws' of gravity describe the behaviour of physical objects?

Social Science

What do we mean by 'social'. This is an oddly elusive term, given that so many generations have devoted themselves to social reform, social science and so on.

- First the concept signals the totality of the domain of relationships between persons – all of these are social.
- Second, though, some relationships, or some aspects of the relationships, between persons are physical, some symbolic, and we can distinguish social from these.
- Third, it can signal a subset of those relationships – we divide them in to economic, political, familial etc, and social refers to a rather vaguely defined residual category. The connotations of the term carry the idea that we ARE social, in the sense of sociable, creatures whose existence is saturated with social relationships (unlike, say, slugs who interact mainly/only for sexual purposes).

Who has said what about this?

J.S. Mill

All phenomena of society are phenomena of human nature, generated by the action of outward circumstances upon masses of human beings; and if, therefore, the phenomena of human thought, feeling and action are subject to fixed laws, the phenomena of society cannot but conform to fixed laws, the consequence of the preceding. There is indeed no hope that these laws, though our knowledge of them were as certain and as complete as it is in astronomy, would enable us to predict the history of society, like that of the celestial appearances, for thousands of years to come; but the difference of certainty is not in the laws themselves, it is in the data to which these laws are to be applied. (Logic of Moral Sciences ch6 p63)

The actions and feelings of human beings in the social state are, no doubt, entirely governed by psychological and ethological laws; whatever influence any cause exercises upon the social phenomena, it exercises through those laws. Supposing, therefore, the laws of human actions and feelings to be sufficiently known, there is no extraordinary difficulty in determining from those laws the nature of the social effects which any given case tends to produce. (p84)

Popper

on scientific explanation:
To give a causal explanation of an event means to deduce a statement which describes it, using as premisses of the deduction one or more universal laws together with certain singular statements, the initial conditions. For example, we can say that we have given a causal explanation of the breaking of a certain piece of thread if we have found that the thread has a tensile strength of 1lb and a weight of 2lbs was put on it. If we analyse this causal explanation we shall find several constituent parts. On the one hand there is the hypothesis: 'Whenever a thread is loaded with a weight exceeding that which characterises the tensile strength of the thread, then it will break'; a statement which has the form of a universal law of nature. On the other hand we have singular statements (in this case two) which apply only to the specific event in question: 'The weight characteristic for this thread is 1lb', and 'The weight put on this thread was 2lbs'.

In the footnoteadded to a later edition he offers an alternative account of the example:" *A clearer analysis of this example – and one which distinguishes two laws as well as two initial conditions – would be the following: 'For every thread of a given structure S (determined by its material, thickness, etc) there is a characteristic weight w, such that the thread will break if any weight exceeding w is suspended from it.' - 'For every thread of the structure S1 the characteristic weight w1 equals 1lb.' These are the two universal laws. The two initial conditions are: 'This is a thread of structure S1' and 'The weight to be put on this thread is equal to 2lbs.'"*

on universality
Popper distinguishes strict universality from numerical universality:

- Strict universality:
    - 1. *"Of all harmonic oscillators it is true their energy never falls below hv/2".* This statement is true for any place and any time; it is not replaceable by a finite number of singular statements.
- Numerical universality:
    - 2. *"Of all human beings now living on earth it is true their height never exceeds 4 metres"* This statement is true (or could be false) for a specified place and time; it is replaceable by a finite number of singular statements. Popper argues it is best treated as a species of singular statement.
    - The point is that *strictly universal statements must be hypothetical*. Numerically universal statements *can be* hypothetical – I don't actually know whether statement 2 is true, although it's a reasonable working hypothesis.
    - A parallel distinction can be drawn between kinds of concepts: dictator, H2O, social class, are *universal concepts;* Hitler, the Atlantic, the C19 working classes, are *singular concepts*

Carl Hempel (b.1905)
Hempel formulated the most precise version of the **'covering law model**' of scientific explanation.

He calls his model of explanation the '**deductive-nomological' model:**

1. C1, C2 .... Cn (conditions)
2. L1, L2 .... Ln (laws)

_____

3. (entails) |= Event to be explained

1 + 2 = Explanans
3 = Explanandum

Secondly, he offers an **'inductive-probabilistic'** or a '**probabilistic-statistical**' form:

1. Fi (in instance i (the case) factors F were realised)
2. (P) prob(O, F) is very high

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3. (implies) |- Oi

Probabilistic explanation, just like explanation in the [previous manner] is nomological in that it presupposes general laws; but because these laws are of statistical rather than of strictly universal form, the resulting explanatory arguments are inductive rather than deductive in character. (Hempel, in Ruben (ed) p23)

Hempel argued that both these models are applicable in history and the social sciences.
Rational choice theory is deductive/inductive:-

1. A was in a situation of type C (initial condition 1)
2. A was disposed to act rationally (condition 2)
3. Any person who is disposed to act rationally will, when in a situation of type C, invariably (with high probability) do X. (covering law)

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4. (implies) |- A did X

Standard objections to Hempel's model

1 **Calculation is not explanation:**
The flagpole.
Given the height of the flagpole, the time of day (elevation of sun in sky), rectilinear propogation of light, we can predict the length of the shadow. Equally, given the length of the shadow, time of day, rectilinear propogation of light, we can predict the height of the flagpole. However, although we may accept that the height of the flagpole and elevation of sun explain length of the shadow, we do not accept that the length of the shadow and the elevation of the sun explain the height of the flagpole.

That is, what Mill called 'the geometrical method' conforms to Hempel's model. Given a limited amount of data we can <u>calculate</u> what an unobserved datum or measurement must be. But these calculations, given a covering law, are indifferent between explanans and explanandum – either one can play the part of the other. That is, there is a logical symmetry between explanans and explanandum.

2 **Prediction is not explanation:**
The barometer
With a drop in the barometer reading we can predict the coming storm. But we don't think the barometric reading explains the storm; rather a drop in atmospheric pressure explains both.

This case is like the flagpole only the question of temporality is even clearer. In particular it picks up the relationship between <u>prediction</u> and <u>explanation</u>. In Hempel's model explanation is both prediction and retrodiction. But it is hard to see how the model can rule out the converse: that prediction and retrodiction <u>are</u> explanation. Yet, as this case demonstrates, prediction is not explanation.

3 **Contingent relations are not explanatory:**
The pill

The man who regularly takes his female partner's birth control pills does not have a good grip on the explanation why he does not get pregnant despite sexual intercourse.

4 **Probability 'explains' both what does and what does not happen**
Syphilis and paresis

- Of individuals with latent untreated syphilis, about 25% will contract paresis.
- In any case, latent untreated syphilis explains the contraction of paresis.
- However, in 75% of cases latent untreated syphilis does not cause paresis.
- The *explanans* relates to events that are relatively improbable.

Max Weber

from 'Objectivity in Social Science':

where we are studying concrete phenomena (events, processes) ' the more general the laws, the less they can contribute to the causal imputation of individual phenomena'; ... the determination of hypothetical laws ... would only be the first of many operations that would lead us to the desired type of knowledge, the knowledge of causal laws is not the end of an investigation, but only a means; ... an objective analysis of cultural events which proceeds according to the thesis that the ideal of science is the reduction of empirical reality to laws is meaningless. It is not meaningless as is often maintained because cultural or psychic events, for instance, are objectively less governed by laws. It is meaningless [because] the knowledge of social laws is not knowledge of social reality, but is rather one of the various aids used by our minds for attaining this end; [Martin and MacIntyre pp 537, 539-40]

Laws

- *Could there be* laws operating in history and the social world?
- *Are there* laws operating in history and the social world?

Rational action theory

- 'The laws of rationality govern individual actions'

Agent S, faces option set Oi...On, has an ordered set of preferences Pi....Pn;
Given O, P1 is A's first choice;
Realisation of P1 entails action A1.
S does A1.

P predicts A; A predicts P.

- non-rational action:
    - norm guided
    - emotion driven
    - rationality failure
    - coerced behaviour
    - preference adaptation
    - weakness of will

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Explanation I
Worksheet

1. Discuss the premisses, inferences, and conclusions of the two extracts from Mill.

2. Try to offer a conceptual analysis of the following:

   2.1. Agen/t/cy

   2.2. Law

   2.3. Hypothetical

   2.4. Descript/ive/ion/ism

   2.5. Prescript/ive/ion/ism

3. Can you think of any examples of strictly universal statements from contemporary social science?