

## A Causal Paradox for Hypothesis

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### Abstract

As it is well-known any respond to a research question which intends to give an explanation has the form of a hypothesis. Such an explanation in essence aims to represent a structure which contains three components: the term/s used to explain something (explanan/s), the term used for the event to be explained (explanandum) and the term express the causal relation between them (explicandum). But if you want to put such a hypothesis into an empirical testing procedure, you have to change its causal structure by substituting with a statistical correlation structure. Otherwise you could not realize an empirical testing procedure. Here the paradox situation in essence consists in the contradiction between our aim to control empirically if the explanan/s is/are really explanatory/is factor/s (i.e. causal term/s) and the real impossibility to do empirically this control. For resolving such contradiction we need to change our aim and to substitute the control of causal relation (explicandum) with the control of statistical association between the terms included in the hypothesis. So doing, in fact we have substitute the hypothesis as explanatory structure with its "quantitative twin". The "qualitative twin" is substituted with its "quantitative twin" (as its operationally or parametrically transformed variant) for the necessity to realize measurements as part of an empirical testing process. Logically this is not legitimated, but methodologically we have not other choice to do.

**Keywords:** causal relation, statistical association, necessity.

### A Causal Paradox for Hypothesis<sup>1</sup>

As it is well-known<sup>2</sup> any respond to a research question which intends to give an explanation has the form of a hypothesis. Such an explanation in essence aims to represent a structure which contains three components: the term/s used to explain something (explanan/s), the term used for the event to be explained (explanandum) and the term express the causal relation between them (explicandum). But if you want to put such a hypothesis into an empirical testing procedure, you have to change its causal structure by substituting with a statistical correlation structure<sup>3</sup>. For this reason Monroe emphases that "...All type of research designs intended to determine whether causation exists is set up to measure the extent of covariation"<sup>4</sup>. So you need to do such substitution otherwise you could not realize an empirical testing procedure. The question is – Why? Why you can not empirically test a causal relation between one or some explanans and one explanandum? The answer is because these terms are qualitative ones and as qualitative they can not be measured directly. To measure them you need to create their quantitative homologues ("quantitative twins") by mean of a parameterization procedure. Any of these quantitative homologues can be measured and by creating the set of its values you could compare their variation tendencies. If you now change the form of hypothesis by substituting the explanatory structure with a descriptive one, which gives a mathematical proportion (direct or indirect) between the variations of dependent and independent variable, you practically make possible to compare a theoretical prediction with an empirical notice. And this is in essence a procedure of empirical testing for a hypothesis. By doing the mentioned

<sup>1</sup> We decided to recur again to this topic because of our conviction for its importance.

<sup>2</sup> By the textbooks of Researches Methods or Kocani A., (2013) *Një qasje plotësuese epistemologjike në metodologjinë e kërkimit të shkencave sociale*, Albanian University Press, Tiranë, 2013, f.63-64 (An Additional Epistemological Approach to the Research Methodology of Social Sciences, Albanian University Press, Tirana).

<sup>3</sup> Boudon, R., (1971) *Les Mathématiques en Sociologie*, Presses Universitaires de France, Paris, p.21-36.

<sup>4</sup> Monroe Alan D., (2000) *Essential for Political Research*, Westview Press, Illinois State University, p.31-32.

substitution it is possible to deduce some statistical predictions in the form of conditional judgments and so the observation could compare these predictions with their empirical notices (or "homologues"). In the case of their coincidence there is a positive result of empirical testing and in the opposite case there is a negative result of empirical testing. The first testimony for a verification procedure while the second for a refutation one. Here once you reach some positive or negative results you may propose to respective scientific community the acceptance or not for the "hypothesis" in question<sup>5</sup>. But rigorously speaking now you are considering the results of empirical testing for the implications deduced from an assertion that do not function as an explanatory structure as it was the first ("original") variant of the hypothesis. They concern a descriptive structure, which expose a statistical covariance between two variables. So the interpretations based on these results have nothing to do with the "original" variant. That means there is indeed not an empirical testing for the first form of hypothesis. This is the reason why the above term is putted under quotation-marks. Such conclusion make in evidence a paradox situation: it is pretended to empirically test a hypothesis, but really is empirically tested something different. Anyway, regardless of knowing such paradox situation the researcher as Boudon, for example, emphases the idea that "...causal analysis can't be other thing that an implication analysis"<sup>6</sup>. That is to legitimate the substitution of an explanatory structure with a descriptive structure for the assertion proposed as hypothesis. In this way the substitute supporters, such as Karl R. Popper<sup>7</sup>, propose to consider the causality principle as the expression of a rule or of a decision. Or, as says Raymond Boudon, "the methodological literature..... comport, in one hand, a group of methods under the nomination of "causal analysis"..."<sup>8</sup>.

As conclusion the substitution of hypothesis as an explanatory structure with a statement as a statistical descriptive structure with the aim to realize an empirical testing procedure is logically speaking too problematic. So it is not logically legitimated, but may be considered as legitimated in a methodological sense. And this is because of fatality to do not have other choice for implementation of an empirical testing for scientific statements.

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<sup>5</sup> Kocani A., (2013) *Një qasje plotësuese epistemologjike në metodologjinë e kërkimit të shkencave sociale*, Albanian University Press, Tiranë, 2013, f.65-66, 68-69 (An Additional Epistemological Approach to the Research Methodology of Social Sciences, Albanian University Press, Tirana)

<sup>6</sup> Boudon, R., (1971) *Les Mathématiques en Sociologie*, Presses Universitaires de France, Paris, p.35-36.

<sup>7</sup> Popper Karl R., (1982) *La logique de la découverte scientifique*, Payot, Paris, p.59.

<sup>8</sup> Boudon, R., (1971) *Les Mathématiques en Sociologie*, Presses Universitaires de France, Paris, p.35.