Other articles

Hypotheses in Human Sciences — considerations on the nature, functions and uses of hypotheses

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Abstract:
This article reflects on the use of the hypothesis in scientific research and in the elaboration of texts in Human Sciences. It aims to present, in the first part, the nature and importance of the hypothesis in Social and Human Sciences, bringing examples from History, Sociology, Urbanism and other fields of knowledge. Hypotheses are discussed as necessary resources for the social and human sciences that are based on problems. The article points out the functions of the hypothesis for research in particular and for Scientific Knowledge as a whole. The overriding goal of the article is to make a contribution to students and professors of the social and human knowledge fields, giving some practical suggestions and means for understanding and clarifying how hypotheses can be used in these fields. To clarify the explanation, the main example present in the text refers to a historical problem related to the Conquest of America in the 16th century, aiming to show that, in the human sciences fields, a single problem may have many different hypotheses and solutions.

Key words:
Hypothesis, Human Sciences, Scientific Knowledge, Methodology Teaching.


One of the key questions in teaching Social Sciences is to enable the student to understand the intersection between technical and methodological resources, and their practical application in Research. Aspects such as the use of Hypotheses in Social Sciences are not easy to teach, unless focusing directly on the practical side of Research, hence the entire effort of systematisation that aims to bring examples to the fore that make it easier to learn these interrelations makes an important contribution to the Education Sciences as regards their more practical and operational dimension. This article, as well as discussing aspects of Teaching of Scientific Methodology, is especially geared towards students who are taking their first research steps in social sciences. The aim, more specifically, is to outline details that will help them understand and clarify pertinent aspects concerning the use of Hypotheses in Social and Human Sciences (History, Sociology, Anthropology, Geography, Urbanism and others).

We start by saying that, in an academic research project, and in a text aimed at presenting the results of this research, the Hypothesis can play a crucial role. To back up this proposition we firstly look at the origin of the need to use it in human sciences.

Scientific research in the West, and it is no different with the social and human sciences, has been built basically around the attempt to solve well defined “problems”, which generally constitute the starting point of the research process. History, from the moment it took on the project to become a science, has been no different, nor have the various human sciences such as Sociology, Anthropology, Geography, Economics and others. To give the example of History, this need to define the problem has been increasingly evident in western historiography — above all from the 20th century onwards, when it surpassed the Narrative or Descriptive History of the 19th century in favour of a “Problem-History”. It makes no sense, for today’s professional historiographer, to simply narrate a sequence of events or describe a certain historical scenario, if this narrative or description is not framed inside a problem.

To frame a problem is to launch inquiries, propose wide-ranging articulations, connect, build, deconstruct, try to discern in a new way, and a series of operations that make one focus on the collated material and compiled data. To frame a problem, down to the smallest degree, is to raise a question about something that has been empirically proven and about a reality that has been empirically proven or about a reality that has become evident to the researcher.

The formulation of hypotheses in the scientific research process is precisely the second part of this modus operandi inaugurated by the formulation of the problem. Before all else the hypothesis corresponds to a possible answer to the formulated problem — to a supposition or provisional solution through which the imagination anticipates knowledge, which is subsequently verified (to be confirmed or rejected). The hypothesis is in truth a resource of human reasoning when faced with the need to overcome the impasse produced by the formulation of a problem and the aim to acquire knowledge that has not yet been obtained. It is the guiding thread for thought, through which one attempts to find a suitable solution, at the same time as inappropriate solutions to the problem are progressively discarded.

One can say that the Hypothesis is a provisional assertion that, far from being an evident proposition in itself, may or may not be truthful — and which, within a scientific elaboration, should be necessarily submitted to careful procedures of verification and demonstration. It is one of the links of the argumentation or research processes (in scientific research it is generated based on
a proposed problem and triggers a process of demonstration after it has been stated). This is why, etymologically, the word “hypothesis” literally means “underlying proposition”. What is “underlying” is precisely a statement that shall be backed up by others, or by an articulated series of statements, so that the Hypothesis plays the role of a kind of guiding thread for the building of knowledge. Despite its provisional nature, the Hypothesis is the basis of scientific argument and undertakes a set of functions within research and development of scientific knowledge, as shall now be discussed.

THE FUNCTIONS OF THE HYPOTHESIS IN RESEARCH

The Hypothesis plays several roles in Scientific Research, both as regards specific research that is specifically undertaken, and as regards scientific knowledge in general. Table 1 lists some of these functions. The shaded parts include the functions of a given research or its Planning. The non-shaded parts include the functions that the Hypothesis plays in relation to scientific undertaking in general.

First, the Hypothesis establishes a “more defined direction for the Research” that is being carried out. This may take the form of fixed aims related to stages to be completed, or may be incorporated into specific methodological procedures. In other words, it has a “guiding function” (1). Therefore, in an investigative sequence the researcher may use successive hypotheses, discarding those that do not back up the demonstration or those that are not supported by the sources in the articulation of the empirical data. Each hypothesis formulated, at times may dictate the stages in tackling the problem to be solved, in the same way that each hypothesis implies specific methods for its investigation.

A hypothesis is a guide precisely because it articulates the different dimensions of the research, functioning as an authentic nodal point in which one finds the topic, theory, methodology and materials or sources of the research. A good test to check if we are on the right track as regards the formulation of hypotheses, is to associate each hypothesis to its possible verification procedures,

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**TABLE 1**

<table>
<thead>
<tr>
<th>Functions of the Hypothesis in Research and Scientific Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. GUIDING FUNCTION</strong></td>
</tr>
<tr>
<td>Lending direction to the Research</td>
</tr>
<tr>
<td>(the Hypothesis helps to demarcate the Topic)</td>
</tr>
<tr>
<td><strong>2. DELIMITING FUNCTION</strong></td>
</tr>
<tr>
<td>Restricting the field of research</td>
</tr>
<tr>
<td>(the Hypothesis helps to demarcate the Topic)</td>
</tr>
<tr>
<td><strong>3. INTERPRETATIVE FUNCTION</strong></td>
</tr>
<tr>
<td>Propose a possible solution to the Problem investigated</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>4. ARGUMENTATIVE FUNCTION</strong></td>
</tr>
<tr>
<td>Trigger inferences and function as starting points for deductions</td>
</tr>
<tr>
<td>(channelling of the hypothetical-deductive method of reasoning)</td>
</tr>
<tr>
<td><strong>5. COMPLEMENTING FUNCTION</strong></td>
</tr>
<tr>
<td>Filling in gaps in knowledge</td>
</tr>
<tr>
<td>(by proposing provisional explanations)</td>
</tr>
</tbody>
</table>
methodologies to be used, materials based on which this verification can be drawn, as well as the basic theory and its articulation with the topic. To understand better: if there are no suitable sources and methodologies to prove the hypothesis, it will be of no use, as it shall be no more than mere conjecture. If there is no theoretical articulation, this is also a sign that something is wrong (at least one has to define all the important terms included in the hypotheses). Likewise, if the hypothesis is not articulated to one of the aspects of the topic, or is irrelevant to it, or the topological boundaries of the Research are not well defined in relation to what the research intends to verify, something is wrong. Therefore, to avoid the traps of investing in a useless, unarticulated or irrelevant hypothesis — i.e. a hypothesis that does not suitably fulfil its “guiding function” — an excellent strategy is to imagine a table associating the hypotheses to the methodological procedures, sources and related theoretical aspects. We can say, for example, that the research is carried out around three or four hypotheses, each one with their own procedures and possibilities for documental proof. The table to articulate the hypotheses with other aspects of the research could be something like this:

**TABLE 2**

**TABLE TO REGISTER THE ARTICULATION OF THE HYPOTHESIS WITH OTHER DIMENSIONS OF THE RESEARCH**

<table>
<thead>
<tr>
<th>Sources to be used for proof</th>
<th>Methodologies to be used</th>
<th>Theoretical articulations (e.g. concepts with which the hypothesis dialogues)</th>
<th>Articulations with the topic (e.g. factors taken into consideration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYPOTHESIS 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HYPOTHESIS 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HYPOTHESIS 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HYPOTHESIS 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We will return to this table later on, giving a specific example. For now we return to the multiple functions of the Hypothesis in research. As well as lending the research a direction, outlining in advance the methodological procedures and technical and documental resources that will be employed, the hypothesis fulfils the purpose of “restricting the field of research”, imposing a more specific boundary to the Topic. As such, the hypothesis serves as a “delimiting function” (2).

Hence, for example, studying the Conquest of America (historical process that took place from the 16th century onwards, with the Spanish and Portuguese expansion through the great navigations) constitutes an extremely broad, even vague, topic. To get over this unsatisfactory situation of the researcher faced with a wealth of plentiful possibilities — and to draw up a specific research topic — it is necessary to delimit within the theme a problem and hypothesis system. We now put forward some specific examples. In the History of the Conquest of America, one of the most intriguing and fascinating question historians have faced is to try and understand how empires as well organised as the Aztecs or the Incas, inhabited by millions of natives, were defeated by just a few hundred Spanish soldiers in such a short space of time and with such apparent ease.

Abundant hypotheses have been proposed as possible answers to this riddle, “ranging from the inferiority of the weapons of the indigenous (Las Casas), to the political divisions inside these empires (Bernal Díaz, Cieza de León); from the strategic military mistakes to explain the defeat of Atahualpa in Cajamarca (Oviedo), to the sophisticated explanations of modern scholars that consider the defeat of the Indians a consequence of their inability to decode the signals of the conquerors (Todorov)” (Bruit, 1994, p. 18).

The mere delimitation of the above-mentioned problem implies an initial diminishing of the broader topic of the Conquest of America. With a problem formulated, the historian drops this vague and ample theme of the Conquest of America as a whole, and starts to focus on something much more specific. Next, the choice of one or several combined hypotheses with provisional solutions or paths for research will further break down the topic. As such, when Todorov formulated the hypothesis of a rapid and dramatic defeat of the Mexican natives as a consequence of their “inability to decode the signals of the conquerors” and assimilate the radical alterity with which they were faced upon the arrival of the Spanish, he was ploughing a path through a forest of possibilities. This path would lead the Bulgarian scholar to research into aspects related to the imagination, in contrasting the visions of the world of the conquerors and the conquered, the signalling systems in confrontation. In the same way, this transversal demarcation in the theme would lead to the possibility of using methodologies that dialogue with the linguistic, the semiotic, anthropology or even psychoanalysis, which are precisely the fields of knowledge that bring to the fore discursive, symbolic and behavioural aspects.

Likewise the choice of sources that should include texts from which it is possible to also access the discourse of the native Mexicans, arose here as practically
a natural consequence — leading Todorov to examine with special attention the sources such as those that were produced by the Aztec natives in the period immediately subsequent to the Conquest (reports produced by the Aztecs in the period immediately after the Conquest; Mexican songs from the period, other sources). On the other hand, it was necessary to compare these sources — representing the Aztec point of view, although in some cases with mediation — with sources representing the Spanish conquerors’ point of view, such as the famous “Letters from Hernán Cortés to the King of Castile”.

This combination of sources would allow a better understanding of the “cultural shock” between the two civilisations, and the reactions of the parties involved in relation to this confrontation (Todorov, 1993).

Suitably articulating the aspects mentioned above, the illumination of a pertinent problem regarding the Conquest of America, based on a well selected and innovative hypothesis, led Todorov to produce one of the most interesting books on the subject written in recent times. As an example, the following table could be drawn up for the Hypothesis proposed by Todorov:

**Table 3: Articulation of Todorov’s Hypothesis with Other Dimensions of the Research**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Sources</th>
<th>Methodology</th>
<th>Theoretical Articulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The rapid and devastating subjugation of millions of Aztecs by just a few hundred Spanish conquerors is explained, above all, by the inability of the Aztecs to assimilate the “cultural shock” produced in the confrontation between the two civilisations, and by their inability to decipher the codes of the conquerors.</td>
<td><em>The Sahagun’s Informants</em>&lt;br&gt;<em>Mexican Songs</em>&lt;br&gt;<em>Letters from Hernán Cortés</em>&lt;br&gt;<em>Chronicle of Bernál Díaz</em></td>
<td><em>Semiotic Analysis</em>&lt;br&gt;<em>Comparative Approach</em></td>
<td>Conceitos de&lt;br&gt;“cultural shock”&lt;br&gt;“alterity”</td>
</tr>
</tbody>
</table>

The example discussed certainly offers us a good example of the “guiding” and “delimiting” functions of a research hypothesis. These functions are articulated naturally with the basic function of the Hypothesis which is to “propose a possible solution for the researched Problem”, and which we can call “interpretative function” (3). In this respect it is necessary to remember that a scientific problem, above all in the human sciences area, does not always have a single solution. This may happen with mathematical problems, but not with social studies that involve complex questions of interpretation and readings produced in the interaction between the subject and the object of knowledge.

**A PROBLEM AND ITS DIFFERENT HYPOTHESES**

We resume our example using the problem of the Conquest of America. Table 4, on the following page, seeks to map out the proposed problem — that of the subjugation of millions of Mesoamerican natives organised into centralised and developed empires such as that of the Aztecs, in such a short space of time by just a few hundred Spanish soldiers, ... is down to essentially the difficulty of the Aztecs in dealing with alterity and the cultural shock produced by their coming into contact with their conquerors.

Hypotheses are often drawn up using this method, especially those that aim to find out the relations between an event or phenomena and the dominant factors that made it possible. The problem itself can appear in this case as the first half of the hypothesis, and the provisional solution or anticipated answer may correspond to the second half. However, the important aspect to point out — as shown in the example — is that numerous historians have
proposed several hypotheses regarding the problem of the Conquest of America, such as these or others, and even more frequently combinations of hypotheses that aim to provide a complex or multi-factorial explanation to the problem. To back up the hypotheses proposed, these historians have come up with wide-ranging arguments, supported by several sources, analysing them using various methodologies and tackling the problem based on specific theoretical frameworks.

To tell the truth, the formulation of several explicatory hypotheses regarding the Conquest of America began immediately after the epoch of the events. Bernal Diaz, who made up part of the Cortês expedition, provided the starting point with the hypothesis that attempted to explain the success of the Conquest in terms of the extreme skill and courage of the Spanish conquerors, which is understandable given that this historian and participant in the expedition had no option other than to defend the point of view of the Spanish conquerors. Much later, in the 19th century, this hypothesis was vigorously recuperated, essentially trying to praise the conquerors, especially with the sector of historiography that became known for producing a “History of Great Men” — this history in which the great historical figures were the people chiefly responsible for the events. Hence, William Prescott, a historian who wrote about the Conquest of America in 1843 (Prescott, 1909), would attribute the success of the company that led the Conquest of America to the achievements of Cortês and his men, and even in the 20th century, when The History of Great Men was subject to bruising criticism, this hypothesis would still be reformulated several times³.

### Table 4

**The Conquest of America: One Problem and Several Hypotheses**

<table>
<thead>
<tr>
<th>Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>The courage, determination and skill of the Spaniards</td>
</tr>
<tr>
<td>Superior weapons of the Spaniards</td>
</tr>
<tr>
<td>Superiority of the Spaniards in military strategy</td>
</tr>
<tr>
<td>Political divisions within these empires that benefited or were skillfully exploited by the Spaniards</td>
</tr>
<tr>
<td>The mythology of the Mesoamerican people, which lent itself towards viewing the Spanish conquerors as Gods</td>
</tr>
<tr>
<td>Cultural shock between the Spanish and Mesoamericans, which counted against the latter due to less ability to deal with alterity</td>
</tr>
<tr>
<td>Disease transmitted by the Spanish to the natives who had no organic resistance to it</td>
</tr>
<tr>
<td>The ubjugation of Mesoamerican empires that were extremely organised, inhabited by millions of natives, in such short space of time by just a few hundred Spanish conquerors,</td>
</tr>
</tbody>
</table>

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The Conquest of America: One problem and several hypotheses
As for the “weapons superiority” hypothesis (2) — which to some degree should enter any analysis about the Conquest of America — it cannot possibly alone explain the speed of the process and the intensity of the devastation, let alone the fact that the Spanish had to confront an enormous disproportion of millions of Aztecs against just a few hundred Spanish soldiers. This hypothesis, important but not sufficient, is difficult to be convincing when not articulated with others, such as for example point “4”, which suggests that “internal political divisions within the Aztec societies benefited or were exploited skillfully by the Spaniards.” Indeed, there are possible nuances within this same hypothesis. When one says that the Spanish knew how to exploit the divisions in the Mexican societies and reciprocal rivalries among the peoples of the region, it puts the Spanish conquerors at the centre of the stage, as the main actors, and writes a history from the European point of view. When one proposes that there had been a prior indigenous civil war that had weakened the Aztec empire, and that this had created the conditions for the Spanish to impose their domination, the role of the Spanish conqueror shifts to one of a somewhat coercive party, and makes the Aztecs and their indigenous enemies the main actors of the plot. The history is told from the Aztec point of view, and the arrival of the Spaniards is pushed into the background as an external event — not the opposite way round.

We have already mentioned Todorov’s celebrated hypothesis about the cultural shock, whereby the meeting, although having a huge impact on the two civilisations, would benefit the Spanish at the end of the day. After all, the Aztecs up to the moment of the arrival of the Spaniards in America had not encountered peoples other than those relatively similar to themselves. The Spanish, on the other hand, had met populations very distant from European peoples, such as Asians, Africans and Islamists. The Spanish, one can admit, had undeniably greater experience of alterity.

We shall possibly never arrive at a single explanation concerning the Conquest of America that is considered more pertinent than all the others. In truth, the elaboration of historical knowledge consists precisely of this permanent re-examination of the past based on given sources and certain points of view. Hypotheses in History or in the Social Sciences cannot be dressed up as absolute truths (if truths of this kind exist), because there is an obviously broad area of interpretation to be filled in by the historian or sociologist in their reflection on present-day or past social problems. In time: what can be confirmed as uncontestable data or empirical statements, in which every one precedes others in a logical manner, comprises what is called “demonstration”. It is in fact this “argumentative function” of the Hypothesis which authorises its etymological sense of “underlying proposition” — of a proposition that underpins the other. All hypotheses in general entail what we can call an “inference empowerment” (capacity to give rise to other propositions). It is this inference empowerment of hypotheses, in articulation with empirical checks, that feed the scientific discourse.

The “argumentative function” of the hypothesis is carried out, on the other hand, not only based on examining its consequences, but also through the articulation of these examinations with other hypotheses, so that two or more hypotheses combined can also produce new inferences. An example of logical articulation of hypothetical statements is presented in the work Suicide by Émile Durkheim (Durkheim, 1999). The problem is constituted around an investigation into the social dimension of suicide, examining it not only as an individual event, but also as a social phenomenon that is expressed through the individual. The motivations and implication of suicide for human experience have to be investigated. Firstly, the hypothesis is presented that suicide is motivated by unalleviated tensions and anxieties (a). A hypothesis is subsequently proposed that will immediately converge towards the problem: the “social cohesion” of a group provides mechanisms to alleviate or fight against the tensions and anxieties experienced by some individuals (b). Consequently, the hypothesis is drawn up that given kinds of social groups possess more social cohesion than others (one kind of religion when compared to another, for example) (c). Hence, it will be possible to predict a lower suicide rate in groups of greater social cohesion when compared with less cohesive ones (d).

Naturally this chain of inferences based on converging hypotheses was backed up in this brief summary in an exclusively argumentative manner. In any research, the “logical demonstration” should come enveloped by an “empirical verification”. The empirical support should precisely back up each of the statements with concrete data. One can, for example, propose a method to measure aspects regarding the “social cohesion” in a specific human group (members of a Catholic community, for

(serving as guides for the investigation), delimiter (restricting the object of the research) and interpreter (proposing provisional solutions to a problem). But as well as this hypotheses also carry out an important argumentative function within a specific scientific assignment (4).

Hence, in accordance with the “hypothetical-deductive” reasoning method, hypotheses should act as triggers of inferences — whereby their consequences generate new propositions, and these new propositions alongside the original hypothesis will also produce new inferences. This formation of an articulated series of statements, in which every one precedes others in a logical manner, comprises what is called “demonstration”. It is this inference empowerment of hypotheses, in articulation with empirical checks, that feed the scientific discourse.

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example). Afterwards, the suicide rates in this group should be quantified. These two operations should then be repeated for another kind of group to enable a pertinent comparison (the members of a Protestant community, for example). Comparison of the indices obtained for each group, both those indicating “social cohesion” and those shown in suicide rates, will confirm or refute the idea that the suppositions proposed effectively produce a pertinent articulation (the articulating hypothesis that “social cohesion” is inversely proportional to the “quantity of suicides”).

The next three functions to be commented on (Table 1, non-shaded part) are the role of the Hypothesis not only within a single research project taken in isolation, but within the broader scope of science. We shall discuss, on the one hand, the potential of some hypotheses to fill gaps in knowledge, and on the other hand which, for some reasons, end up acting as an interconnection among various research projects — be they examination of their possibilities in other research, be they the capacity to bring together a series of empirical data produced by different researchers.

Firstly we consider that well-grounded hypotheses, even if they cannot yet be fully proven or refuted, can play a significant role in “filling gaps in knowledge”. The hypothesis has a kind of complementing function (5). Especially for distant periods in the past, when the sources and information available become scarce, the historian may be charged with filling in the silences and emptiness in documentation, until his provisional interpretation is replaced by another one that can be more solidly backed up. Likewise, the social scientist can instigate similar procedures to fill in the social silences of his time, or the difficulties in gaining access to sources and data.

This role played by the hypothesis in order to fill in the empty spaces of knowledge is not foreign to Science in general. It is known, for example, that intriguing “black holes” exist in cosmic space, but as at the moment there is no better way to understand these astronomical phenomena, or to devise experiments to test the nature of “black holes”, scientists often formulate provisional theories on the matter. Speculation in the form of hypotheses is also commonplace as to the “origin of the universe” (such as the celebrated Big Bang Theory). The gaps in knowledge concerning the “origin of Man” has generated successive hypotheses in Science and Religion: man as a direct creation of God (Genesis), man as an evolutionary descendant of apes (Darwin), man as a descendant of the “missing link” that gave rise simultaneously to the human branch and the branch of the other primates (rectifications on the Theory of Evolution), man as belonging to an independent evolutionary chain from the ape (recent research). In each of these cases a hypothesis fills in the gap left by doubts about the origin of man.

Another kind of hypothesis that transcends the mere scope of research where they were generated refers to those that, once proposed, reveal a potential “applicability to other research”. The hypothesis here carries out a multiplying function (6). When a well grounded argument is laid down for a specific case study around a given hypothesis, proving its pertinence, this hypothesis may prove to be applicable to other studies, whereby other possible research and scientific knowledge in general takes advantage of the hypothesis. As such, in developing the hypothesis of the overriding importance of the “cultural shock” in the subjugation of the Aztec societies, Todorov paves the way for the same hypothesis to be applied to understand the subjugation of the Inca society, brought about by Pizarro in the region of Peru, or other similar situations. Of course, for each case the singularities involved must be respected, which should be an important reminder as regards the possibilities of importing one hypothesis from another field of research.

Finally, a last function of the hypotheses, on a broader scale, is that they can serve to organise or unify acquired knowledge, including through generalisations to explain certain “empirical uniformities” that may have been found in different research. We are talking here about a unifying function (7). One example is the case in which an explicatory hypothesis contributes to lend meaning either to a given set of data, or a set of other hypotheses. The following example clarifies this use of the explicatory hypothesis.

Several research projects about urban growth, taking American cities as the field of study, have led certain scholars from the so-called Chicago School and other sociologists to perceive a certain pattern of growth of cities, especially as regards the distribution of the population (Burgess, Park & McKenzie, 1925). Upon analysing the perceived empirical uniformities, some authors aim to formulate hypotheses that correlate these phenomena — among them Ernest Burgess, who wrote his celebrated hypothesis of “concentric circles”.

To back up his original hypothesis Burgess idealised his famous “ideogram of urban development”, whereby growth occurred around a nucleus of focal points that comprise predominantly commercial and industrial activities. The scheme is naturally valid in terms of typically American modern cities (but not in terms of European cities, for example), and is based on processes of “ethnic succession” and “residential invasion”. The basic idea is that the city organises the population based on concentric zones, with the high society living in the peripheral suburbs, and in this case social progression would evolve from the centre to the periphery, so that each social group gradually abandons areas closer to the centre and makes incursions into more socially valued zones.

What Burgess did in this case was to build — by means of a suitable hypothesis — a generalisation that encompassed the various perceived “empirical uniformities”. In other words, the sociologist from the Chicago School organised the reality in the form of what can be called a
“complex ideal type”. Goode and Hatt (Goode & Hatt, 1968, pp. 77-83) draw attention to the fact that this kind of hypothesis should not entail absolute generalisations. It should be made clear from the start that the perceived pattern based on a given recurrence of cases occurs in certain conditions (and not in others). On the other hand, Lakatos and Marconi (2000, p. 149) point out in pertinent fashion that the main role of hypotheses of this kind is to “create tools and problems for new research.” Therefore, the hypothesis of “concentric circles” proposed by Burgess would give rise to others, such as the “multiple circles” proposed by Harris and Ullman and the “axial growth” proposed by Hoyt. It was from the transformations and rectifications in the original model proposed by Burgess that the so-called “socio-cultural ecologists” like Hoyt (1939) proposed the image of a city divided into triangular sectors — like slices of a cake — noting that in several cases interior triangular sectors lose social prestige as they move outwards to the periphery.

The “multiple nucleus” Hypothesis, on the other hand, questions the very idea of a “single centre”, which corresponds to a visualisation model that does not always match urban life. Therefore, Harris and Ullman (1945) sought to point out the composite nature of the city, which would be founded on differentiated nucleuses. They aimed to conciliate them as such, essentially contesting the original idea of Burgess about concentric evolution and the growth proposal by triangular slices put forward by Hoyt.

This example helps us to understand that hypotheses also play a significant role as organisers, even if provisional, of the very empirical data produced through scientific knowledge. They function, in this case, like compartments that hold these data in an organised and coherent manner, or like “creators of meaning” that give new meanings to the knowledge built from several different research projects. Therefore, some hypotheses widely transcend the more restricted scope of a single piece of research, and create larger units between various research projects. It does not matter that in a second phase these hypotheses are replaced by new hypotheses. What is important is that through them, scientific knowledge can transit freely, and be re-elaborated constantly.

It is precisely when given hypotheses bring together in larger and coherent sets a plethora of facts, empirical uniformities and results obtained from research — and especially when the relations proposed for these facts are shown to be sustainable or valid — that a theory can be drawn up.7 Based on these proposed relations and the initial hypotheses, new hypotheses are deduced, such that a new theory becomes consolidated (including the elaboration of new concepts, whenever necessary).

We again cite the example of Charles Darwin’s “Theory on the Origin of Species”. What the English naturalist did was precisely to bring together a series of facts and data built from the observation of nature under the guidance of some new hypotheses, such as the “struggle for existence” and “natural selection”. Subsequently, as a sector of scientists deemed his systematised observations valid (although they did encounter resistance), the set of proposed hypotheses made the leap to the status of “theory” — considered here as a coherent set of hypotheses and concepts that came to constitute a certain scientific vision of the world.

This was also what the sociologists from the Chicago School did in gathering their hypotheses, deductions and explanations for certain empirical uniformities into a theory of “Urban Ecology” — which includes aspects of transposition to the social field of certain aspects from the “Theory on the Origin of Species” proposed by Darwin. It is hence understood that one theory can give rise to another, through the incorporation of new hypotheses or new examinations of hypotheses, or through the transfer of certain hypothetical and conceptual systems to other fields of application (from the nature field to the social field, for example).

Indeed, one should remember that an announced theory should always be considered in relation to the theory it articulates with. A pronouncement that at a given moment, or within a given theoretical reference, can be considered a hypothesis, at another moment can be considered a law, and at a third moment can be deemed conjecture. Hence, the hypothesis of “natural selection”, for example, is considered law inside Darwin’s “Theory on the Origin of Species”, and is considered a principle that should be combined with other factors in the “Synthetic or Modern Theory of Evolution”, and is considered conjecture or a refuted hypothesis in the “Theory of Intelligent Biomolecular Design” by Michael Behe (Behe, 1997).

As well as the uses discussed in this article about research hypotheses, which in historiographical and sociological practice have acquired so much relevance, the table of functions listed earlier aimed to highlight the decisive role of hypotheses in Scientific Research in general — both as regards a specific project carried out (a Thesis, an essay, a Research Project), or as regards the broader aspects of knowledge. The focus on Human Sciences sought to bring this set of observations to the specificities of History, Sociology and other fields of knowledge.

Endnotes


2. Among the sources produced by the Aztecs themselves at a time close to the Conquest are, for example, the statements produced under the guidance of the
Franciscan Bernardino Sahagun, who in 1579 coordinated the work in náuatl of the first version of these sources that became known as Sahagun’s Informants. These reports were published and have even been translated into Portuguese (Leon-Portilla, 1987). Five years later, Sahagun produced a new version, rectifying the previous one, which is a less authentic discourse from the strictly Aztec point of view, which should be attributed to the Franciscan interests at that time, well articulated with Spanish sectors linked to the Conquest (On this matter see Cline, 1988). Hence, the differences between one and other allow one to glean ideological aspects produced in the interaction between the Church and the Spanish Crown. Also the Letters from Hernan Cortês to the Spanish King — reports that recount the point of view of the conquerors — have been published (Cortez, 1996). Also harmonised with this point of view are the chronicles of Bernal Díaz, who took part in the Cortês expedition and published Historia Verdadera de la Conquista de la Nueva España (1632). For more support of the Aztec point of view one can look at the Cantares Mexicanos, produced at the same time (Bierhorst, 1985).

3. As is the case of Hugh Thomas’ book entitled Montezuma, Cortês e a Queda do Velho México (Montezuma, Cortês and the Fall of Old Mexico), which — in basing its analysis on Spanish sources, without filtering their point of view — ended up reinforcing this same hypothesis of placing emphasis on the skill of the conquerors as the overriding factor that ensures the speed with which the Spanish subjugate the Aztecs (Thomas, 1995).

4. This is the point of view transmitted by Bernal Díaz, when he approaches the question of the Spaniards’ alliance with the indigenous peoples who were enemies of the Aztecs.

5. This is the point of view, and the narration, which appears in the indigenous songs (Bierhorst, 1985).

6. Therefore, it is undisputable that millions of Mesoamerican natives were subjugated by the Spanish in the first decades of the 16th century. But the reasons and implications behind this fact will always be re-discussed.

7. It is in this sense that Goode and Hatt state that the hypotheses can form a link between facts and theories (Goode & Hatt, 1968, p. 74).

Bibliographical references


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