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MARGINALITY AND CREATIVITY

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In sociology of science, the notion of marginality refers to the superior and advanced strata of scientific communities, far from the densely populated domains. Scientific disciplines progress at their periphery in contact with other disciplines by cross-fertilization. Marginality favors innovation and creativity.

The word *marginality* indicates the situation of an individual who belongs by ascription, achievement, aspiration, or self-identification simultaneously to two or more distinctive groups, or an individual who does not belong to an established dominant school. The term was used first by the sociologist R. E. Park in 1928 to refer to the cultural hybrids sharing the traditions of two communities. Marginality is a polysemic concept, that is, has different meanings in different contexts. In economics, marginal analysis focuses on borders or limiting areas rather than on the entire phenomenon under investigation. In ethnology, marginality indicates maladjustment, and in cultural studies it means cultural duality. The term is frequently used in studies concerning societal pluralism. In the popular language, marginality may have a pejorative meaning indicating the inferior margins of the society, but in sociology of science it has the opposite meaning, since it refers to the superior and advanced strata of scientific communities and research activities. In the history of sciences it signifies advanced frontiers, the vanguard, and distance from the mainstream, and it takes a noble sense. This article focuses on the social sciences, but the concept of creative marginality is equally important for the natural sciences.

Creativity, Marginality, and Hybridization

Scientific innovation is frequently achieved at the intersections of disciplines and margins. A concrete example would be more appropriate than a theoretical

discourse. How did Pasteur discover the microbe? In order to see a microbe you need a microscope. The essential elements of a microscope are the lenses. The study of lenses belongs to crystallography. Fortunately, Pasteur started his scientific activity a crystallographer. If he had not been a crystallographer he would not have had the idea to use lenses in order to observe microbes. The history of sciences is full of examples of discoveries at the borders of formal disciplines.

Hybridization is a general trend across all disciplines. This is clear in the pattern of Nobel prize winners today. There are many combinations of subfields not officially represented within Nobel's framework. The most fertile of these hybrid subdisciplines include biophysics, biochemistry, mathematical physics, quantum biophysics, neurophysiology, neurochemical physiology, and so on. While not recognized as belonging to hybrids, scientists working at such interstices are the usual prize winners in the now-ancient fields of "biology," "chemistry," or "medicine." In fact, the great changes that have occurred contribute to the growing conviction that the categorization of the Nobel prizes has become increasingly obsolete and that they no longer correspond to the contemporary contours of scientific fields.

In scientific research, most researchers are located at the margins of their formal discipline, in contact with other disciplines. This marginality appears in topological metaphors: overlaps, interconnections, interpenetrations, breaks, and cracks. In political science, for instance, mass behaviour is related to social psychology, elite recruitment is related to sociology and history, urban politics is related to social geography, the welfare state is related to social economy and social history, values are related to philosophy, ethics, and social psychology, governmental capabilities are related to law and economics, poverty in tropical countries is related to agronomy, climatology, and economic geography, and development is related to all social sciences and to several natural sciences.

Many specialists are in the outer rings. They borrow and lend at the frontiers. They are marginal scholars. Scientific disciplines progress at their periphery, in contact with other disciplines by cross fertilization. The core of the discipline tends to stagnate.

Marginality as a Stimulus to Creativity

As Thorstein Veblen has observed, cultural marginality is frequently a stimulus for intellectual creativity. Veblen himself, as a son of immigrants, felt marginal to both American and Norwegian societies. He later concocted the concept of cultural marginality and applied it particularly to Jewish and Quaker families, in order to explain the success and the upward mobility of these two communities.

The concept of marginality is meaningful for the analysis of creativity where scientific disciplines are overlapping. Many scholars, among the most productive and imaginative, work at the intersections of disciplines, at their margins. Like prophets, they exercise their influence in distant fields more often than in their nominal domain. They are hybrid marginals. For instance, the economists Anthony Downs, Mancur Olson and Albert Hirshman have a wider audience in political science than among economists. Sigmund Freud, the founder of psychoanalysis, was contested by his colleagues in medicine and classical psychology. The historian Arnold Toynbee, the criminologist Cesare Lombroso, and the mathematician-economist Augustin Cournot (the "Cournot equilibrium") were not "at home" in their own domain. Muzafer Sherif, one of the founders of social psychology, has explained how his Turkish background made him aware of the cultural biases of psychological theory. The list of stimulations by marginal position is long.



Examples of cultural marginality can be found in research on status inconsistency. Social stratification in advanced societies is almost never unidimensional. The various criteria and roles of individuals (education, occupation, income, prestige, social origin, ethnicity, physical appearance, intelligence, sex, seniority in the organization, and so on) are not ranked identically by all people. These characteristics are perceived as higher or lower, better or worse, and crucial or unimportant. The differences in perception of rankings generate status incongruences.

As Gerhard Lenski has observed, individuals with inconsistent statuses or ranks have the tendency to rank themselves in terms of the status or rank which is highest and to expect others to do the same. But other people, benefiting from a different ranking of statuses, tend to do just the opposite and to treat others in terms of their lowest rank or status. For instance, some rich businessmen would perceive famous professors or scientists according to their income (they would see their small house or old car), and reciprocally some brilliant scientists or artists would tend to perceive the low intellectual level of many owners of capital. The concept of status inconsistency is usually applied to individuals, not the groups. Incongruence of statuses is an individual feeling and perception, not a collective one. For the study of all kinds of minorities (ethnic, racial, religious, and cultural) others concepts are available in the sociological literature. Without the concept of status incongruence it would be difficult to explain the behavior and motivation of many revolutionary leaders, famous rebels, or radical politicians. This concept is indispensable in the writing of biographies of some of the most famous novelists and painters of modern times. This concept is also useful for the discovery of the sources of intellectual stimuli in general, and in social sciences in particular. Three examples among hundreds will suffice. Karl von Clausewitz, who proposed the changing of the Prussian class-based military establishment into an effective fighting force had been dismissed

form the Prussian army for not having been able to substantiate financially his title. The author of one of the most important books of the 20th century, Norbert Elias (*The Society of Individuals*), did not obtain a stable academic position until the age of 57. Lewis Carroll, the "father" of *Alice in the Wonderland* (alias Charles L. Dodgson), was a stutterer and a non conformist professor. In some such cases, the concept of status incongruence is related to the concept of an inferiority complex.

Serendipitous discoveries are interesting cases of creative marginality. Serendipity, a word originated in a legend from Sri-Lanka, is an unplanned, unexpected, fortuitous discovery, which can steer the researcher to the margins of her domain. Robert Merton, in his book on *the Sociology of Science*, has given several examples. One of the most recent serendipitous discoveries was a molecule of nitrogen, for which three pharmacologists received the Nobel prize in October 1998.

Marginality and the Paradox of Density

Research in a given area is subject to the law of diminishing marginal returns. An important part of what scientists see as innovative work is in reality completed before the field has begun to mobilize a large number of specialists. The topic slowly becomes exhausted, and can be reinvigorated only by changing its basic parameters. The tendency of densely populated subfields to produce less innovation notwithstanding a greater effort is what has been called the paradox of density. Adding elements from outside to an overcrowded field can make a big difference.

In the domains where there is a high concentration of scholars, some negative practices can be observed. Too much density can result from teaching needs in particular subjects, like the American presidency and congress or the national history. Density can occur after important historical changes, like after the

implosion of the Soviet Union and of the Communist regimes in Eastern Europe when some 800 Western sociologists and political scientists concentrated their attention on this region that they had previously ignored. In such areas overpopulated with scholars it is difficult to add something new to the scientific patrimony. Overcrowding facilitates the spread of opaque jargons, of verbosity, of theoretical hair-splitting, and of routine work. Such professional deformations are possible only where there is a large community of sinners. In densely populated fields, productivity *per capita* tends to decline notwithstanding the efforts applied. Then, density in the core opens up room for creativity at the margins. The higher the density of scholars in a given field the less likely is, comparatively, imagination and innovation. Marginality is the opposite of density and a good route out of its problems.

Types of Creative Marginal Scholars

In the history of modern social sciences, three basic types of scholars can be distinguished: the pioneer, the builder, and the hybrid. These three types are ideal types, the classification being in some cases arbitrary. The first and the third types are hybrid scholars located in the frontiers of disciplines; the second is a monodisciplinary specialist. These types have been described in *Creative marginality*.

The pioneer is the scholar who expands the territory of a given discipline, and who pushes forward the frontier of his or her discipline. This expansion moves into *terra incognita*, an area about which science was ignorant. The pioneer does not encounter resistance from other disciplines, but conquers empty territories and annexes them. Pioneers do not really cross the borders of their formal discipline: they push that frontier outward toward other disciplines, covering in most cases a no-man's-land. Even if closely associated with one discipline, their marginality means that

each could be appropriated by more than one modern discipline. In fact, many of them never held university chairs in their fields: Adam Smith, Sigmund Freud, and David Ricardo for example. The great historian of the Roman Empire, Edward Gibbon, had little formal education and never held an academic position. The time of their appearance varies, but the pioneers are the first generation of specialists. They are marginals in the sense that they explore the boundaries of their growing field, claiming new ground in the direction of other fields.

After the pioneers come the builders, who follow in the footsteps of these frontiersmen. The role of the builders is to develop the land discovered by the pioneers. They exploit the same territory, developing the subject area of their discipline to the fullest. Once developed, there is less room for further research, and the paradox of density sets in. Then comes the time for a new generation, the hybrid scholars, who combine knowledge from a number of fields.

The hybrid scholar is a border crosser who penetrates the territory held by another discipline or who establishes a province carved out of the territory of two or more disciplines. The hybrid scholar's research takes place at the periphery of two disciplines, not at their core; it also occurs only along a specific part of the periphery, not the entire frontier. The hybrid scholar does not work in old fields. He borrows from his neighbors, and what he creates may be borrowed by both parent disciplines in turn.

Hybrids are, in a sense, pioneers at the intersection of two disciplines, and they may give rise to a second generation of builders within the hybrid field. Some hybrid fields are old by now. Social psychology and economic history are much older than psychological anthropology or socio-linguistics. Different fields are in different phases of growth or decline. Some develop in a spiral, such as political economy.



Creative Marginality at the Summit of the Scientific Pyramid

Contrary to a misperception, scientific progress of disciplines has been achieved in the last three decades mostly by specialists, not by generalists. It is nevertheless true that most of the greatest scholars in the social sciences during the 19th century and until the 1920s were interdisciplinary generalists, from Auguste Comte to Max Weber. The hybrid specialist today may be in reality a "marginal" scholar in each of the disciplines from which he borrows, including his own original discipline. But he becomes central to the intersection of two or several disciplines. Dozens of examples could illustrate this proposition, for the social sciences as well as for the natural sciences.

Major social phenomena cannot be explained in a strictly monodisciplinary perspective. They have to be comprehended transversally across the disciplinary borders. For instance, to explain the fall of the Roman empire we may choose between 15 theories belonging to as many specialties across disciplines. We have the agronomic explanation by Max Weber – the latifundia; the geographical explanation by Montesquieu, the extension of the territory; the demographic interpretation by Piganiol; the slave system by Mommsen; the economic factors by Rosstovtzeff; the decline of the aristocracy by Ferrero; the military interpretation by Luttwak; the foreign trade by Rogowski; an ecological factor, the desertification of the land; a bacteriological factor, malaria; without forgetting Pareto, the only political sociologist to have contributed to the debate. But one of the most interesting interpretations, validated by empirical evidence, does not belong to the social sciences, because it is of chemical nature: the lead poisoning of the Roman ruling class over generations. Saturnism has poisoned a theory in vogue in political science: the circulation of elites.

Why is there no socialist party in the United States? A satisfactory response to this question necessitates a cross-disciplinary perspective: from history (absence of feudalism); from demography (permanent flux of immigration); from ethnology (vertical cleavages); from sociology (relatively high standard of living of the working class); from social psychology (weak class consciousness); from geography (the "open frontier" and the geographical mobility); and the rate of economic growth. We may count more than twenty factors spread across the entire spectrum of social sciences. Among these factors only two belong directly to political science: feudalism and the absence of proportional representation. This is a good example of a multiple hybrid causality of political phenomena at the margins of different disciplines.

Why have tropical countries, particularly black Africa and South Asia, lagged during the last two centuries in the process of economic growth, and why are the advanced pluralist democracies almost all in temperate zones? Such a question could be asked by political scientists, sociologists, geographers, or historians, but in fact only economists like Galbraith, Kindelberger, Arthur Lewis, or Andrew Kamarck have emphasized the importance of ecological factors. To this important political science issue, the most pertinent and innovative questions have been asked and discussed by scholars belonging to other disciplines.

It is not possible to inquire into the major phenomena within a strictly monodisciplinary framework. Only by taking up a position at the crossroads of many branches of knowledge, at the margins of formal disciplines, can one try to explain the implosion of the Soviet Union, the proliferation of giant cities in the Third World, the economic decline of the United Kingdom, the economic growth of Japan, or how a child learns to speak. Whenever a question of such magnitude is raised, one finds oneself at the intersection of numerous disciplines and specialties. All major issues are crossing the formal borders of

disciplines: war and peace, the breakdown of democracy, generational change, the freedom-equality nexus, individualism in advanced societies, fundamentalism in traditional societies, and ruling classes.

Political science, for instance, has contracted an enormous foreign debt, because politics cannot be explained exclusively by politics. Political phenomena are never produced *in vitro*, artificially in the laboratory. They are always related to a variety of factors behind politics. Dozens of none political variables are used to explain politics. This is one of the main reasons why political science is interwoven with the other social sciences. Most of the classical European sociologists and political scientists can be located at the intersections of sociology and political science: Max Weber, Karl Marx, Alexis de Tocqueville, Wilfredo Pareto, Roberto Michels, John Stuart Mill, Gaetano Mosca, and Joseph Schumpeter, for example.

Marginality and Scientific Reputation

The proportion of hybrids is much higher among the most visible scholars than among the rank and file. Such a stratification can be empirically validated by using the Social Science Citation Index and the reference lists of some important books. We can place the 800 most known scholars, the most cited in political science, into two categories: the monodisciplinary scientists and the hybrids. Such a distinction is not easy and is sometimes impressionistic, but in spite of the difficulties it appears that at the top of the scientific pyramid, hybrids predominate. Scholarly reputation and marginality are correlated.

In the cumulative index to the seven volumes of the *Handbook of Political Science*, edited by F.I. Greenstein and N.W. Polsby, more than 3,500 authors are listed. Among those who are cited at least twelve times, about half can be considered to be scholars working in hybrid fields.

The same conclusion can be drawn from the alphabetical index of the *New Handbook of Political Science* edited by Goodin and Klingemann. Among the hundred or so major innovations listed by Karl Deutsch and his colleagues in their *Advances in the Social Sciences*, two-thirds lie at the intersection of various disciplines or specialties. The higher one goes up the ladder of innovations, the greater are the chances that the boundaries between disciplines will disappear.

The proportion of hybrid scholars at the highest levels is not the same in all fields. In the United States it is low for the field of American politics. Conversely, comparative research is densely populated by hybrids. Some subjects are necessarily at the crossroads of multiple specialties, for instance, clientelism, nationalism, and socialization.

Marginality favors innovation: the farther up the ladder of innovation a work is, the more likely it is to be accomplished at the margins of a given discipline, at its intersection with another discipline.

While keeping one foot in their original discipline, most major figures in social science have operated at its borders. Many scholars are knowledgeable in a number of subfields of philosophy, history, economics, political science, cybernetics, and history of science, with their most important contributions coming from the juxtaposition of these subfields. V. O. Key applied two sociological methods, ecological analysis and survey research, to mass political behavior. Gabriel Almond has borrowed anthropological concepts to build several seminal theories in political science, particularly the theory of functional equivalence. Jurgen Habermas had the capacity for synthesis of a variety of subfields of sociology, philosophy, political science, and developmental psychology. Mancur Olson, Jr., used economic ideas to explore issues of relevance for political problems. Johan Galtung and Stein Rokkan were comparativists combining data from history and sociology, and concepts from economics, geography, and history, in their theories on "center and



periphery" and on the genealogical tree of political parties in Western Europe. Several past presidents of the American Political Science Association came from other disciplines. Most of these individuals drew from the borders of economics psychology or sociology; a more extended list would include more crossfertilization from philosophy, history, legal studies, anthropology, and other fields. Some figures are unusual mixes: Quetelet, a professional astronomer and statistician, was an originator

of quantification in the social sciences. Lewis Fry Richardson, a pioneer in the application of statistics to the study of war, was a meteorologist and applied mathematician.

Scientific disciplines progress at their periphery, in contact with other disciplines by cross-fertilization. The core of the discipline tends to stagnate. It is in this sense that the expression creative marginality should be read.

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