

**Uncorrected draft of lecture given at the *ICTs in the Contemporary World* seminar at the LSE Department of Information Systems on 21 June 2006**

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***Probability and fiction in society and in economics***

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The point I would like to start from (also in reference to the context of this seminar) is the concept of information in sociological view - a view that usually is not the first to be mentioned talking about information, but I think that it can offer very useful clues in a field of research at the moment somehow confused. The sociological reflection on information starts from two assumptions:

- in first place Heinz von Foerster's famous statement that "the environment contains no information; the environment is what it is". Information doesn't exist as an independent datum, that can be found and picked up in the world, but is always relative to a system, that not only learns it, but produces it in its own forms and with its own operations. Information exists always as "information for someone", and this someone can be a psychic system (a mind) but also a social system. Here we find the communicative conditions leading to our second point:

- the role of media in the production of information (from writing to the printing press, the mass media, the information technology up to internet) - but this not because media by itself create information (the idea that media are the message), and not even as channels of transmission, since in our perspective information is not transmitted, doesn't pass from the sender to the receiver. The sender actually doesn't lose it, and the receiver gets (if he gets it) a different information then the one his partner had in mind. Media affect rather the extension and the form of the separation from the context: first of all the ability to separate the information from the immediate situation (place, time, role and status of the speaker) and to make it autonomous and even subject to the unlikely procedure of interpretation (that can also be open, i.e. relatively independent from what the author meant).

On these premises, here I would like to speak more concretely of some very particular forms of production and management of information - starting from a factual observation, one of those historical coincidences that always make a sociologist suspicious: the calculus of probabilities and the modern novel (and then the enormously influential field of fiction) were born practically together. The beginnings of probability theory are unanimously located around 1665, beginning with the studies of Pascal and Fermat, and then developed quickly in different directions, while the first novel in modern sense is considered *La Princesse de Clèves* by Madame de Lafayette, published in 1678 and followed by the variegated tradition of the novel. Why? Is it only a coincidence (and it is difficult to believe it) or is there

some form of affinity among these apparently so distant fields, or at least among their semantic presuppositions?

Here I evidently incline to the second hypothesis, that I would like to investigate beginning from the typically systemic concept of "doubling of reality" (Realitätsverdoppelung) - that is actually only a way to deal with the changes in the concept of reality following social transformations. Of reality as such, as of anything, one can speak only contrasting it to something else from which it is distinguished, that can be unreal or real in a different way: speaking of doubling one has in mind an internal articulation of reality, that leads to distinguish so to say the real reality from other kinds of realities, as the fictitious reality constituted by the novels (that are not lies, even if they deal with people and events that don't exist nor have ever existed) or the field of probability, that is not necessarily true, even if it is not a mistake. And it is evident that the availability of these alternative fields modifies also the sense of reality and its practical consequences: "For an observer reality arises only when in the world there is something from which it can be distinguished" (Luhmann).

My hypothesis here is that in the course of 17<sup>th</sup> century emerges a different relationship with reality, or rather that for the first time the doubling of reality characterizing modern society is experienced. In the 17<sup>th</sup> century the notion of reality was notoriously not at all pacific. At the end of the century one was just coming out from the restlessness and dilemmas of the Baroque time, with all the torments, enigmas and experimentations resulting from the breaking of the classical relationship between appearance and reality. Previously this relationship didn't exist at all, or was however not observed: the appearance was an expression of the substance and didn't have any liberty from it - it was a feature of reality. Baroque expresses on the contrary the bewilderment and exaltation in face of the discovery of a non necessary relationship among appearance and reality, that leads to question, in various forms, the independence and the mutual relationships of the two levels: deceptions and ornaments, disguises and metamorphosis, perspectives and paradoxes, nature and artifice. At the end of 17<sup>th</sup> century a series of answers to these questions begin to settle, that will remain the presuppositions of the semantic evolution of the following centuries - solutions that overcome the pure arbitrariness of a contingency without rules and without limits and begin to show forms in which contingency and uncertainty seem to display own criteria and a certain regularity: among these fiction and probability, that from this point of view can be considered related.

This relation, however, collides with the common sense, which assumes that fiction deals with something that doesn't exist, while probability and its calculus have to do, even if in indirect or "subjective" form, with what seems to be the real reality. Both assumptions are not correct, or at least too hasty: the reality of fiction is not without consequences and influences on the presumed real reality, but above all the relationship among real and probable is highly complex and not at all transparent, as shows the tangle of puzzles still bothering today the theory of probability. Are probabilities related to the observer (subjective probability) or to the world (objective probability)? Do they express a degree of trust

(or of lack of knowledge) of the subject or a kind of knowledge (a feature of the things)? Do they imply a stable world or do they allow to face risk? And more: how can one calculate the probability of a world partly unknown, of which one cannot enumerate all the cases? Doesn't the notion of probability perhaps imply itself, i.e. the idea of a range of possibility given in advance and all equally probable, as in the game of dice? But then what has the world to do with it?

The hypothesis I would like to test here is that an investigation of the notion of reality of the beginnings of the probabilities calculus and of the following evolution can contribute to clarify the really curious role that statistical results have assumed in our society. Surveys of various kinds, with the relative processing, seem today to offer a reference to the reality of the world, presented in a potentially informative form - while at the beginning these calculations served rather to disentangle the obscure field of uncertainty and opinions, a not-real field par excellence. How can this shift of accents be explained, where the unreal takes the place of reality, and which relationships does it have with the general asset of modern semantics? And eventually: which relationships does it have with fiction?

In order to examine the notion of reality of the first modernity it is convenient to start from the somehow more consolidated field of fiction and to consider, however quickly, the progressive acceptance of more and more realistic fictitious realities – or rather: of realities that base precisely on realism the legitimacy of the fiction. In other terms: the fiction seems to become acceptable as false construction, when it presents a world as plausible as to be possibly true.

That narration, especially in artistic field, has a certain independence from the truth, is well known since antiquity, as attests the much quoted passage of the *Poetic* in which Aristotle recommends to prefer the impossible likely to the unbelievable possible (Poetic, 60a) - that is: better likely falsehoods than implausible truths. The problem is of course what he means for likely, a notion that in the antiquity had a very different meaning than the one it progressively got since the Renaissance. The notion of reality had a certain autonomy from the factual data: likelihood was mainly understood in moral sense - the representation had to present not the world as it (contingently) is but as it should be, with reference to the ideal, the paradigmatic, the model. The criterion of truth was not the mere correspondence to the world, but rather the correspondence to some more elevated meaning - that's why in St. Augustin's rhetorical universe not every fiction was a lie: it was a lie only if it faked something that didn't mean anything – but if the fiction was connected with a meaning it was not a lie but a figure of the truth. The fiction, therefore, could be truer than the mere factual reality, and on the other hand, as Sir Philip Sidney argues, "virtual truth is often less veracious than moral truth". The criterion of truth was something like absence of contradictory data (contradictory among themselves or in reference to a recognized truth) and was translated in a sort of "inner probability."

Up to the 17<sup>th</sup> century fiction as such didn't have a real legitimacy and always had to face the latent claim to be only a lie: the acceptance of the likelihood didn't correspond to the admissibility of the pure fiction. The narrations tended to leave the matter in the vague, or to look for indirect justification: for

instance presenting so unbelievable stories that nobody could be deceived. That the authors of fiction of the Renaissance didn't mean to delude their readers was evident simply because of the absolute implausibility of the narrated stories: think only at *Orlando furioso* or *Gargantua and Pantagruelles* - much more unrealistic than the chivalrous novels or the histories of giants they parodied. Their need to underline the distance to reality can be seen, on the contrary, also as a symptom of the fact that the matter of realism begun to get problematic.

The relationship between reality and realism changes radically in modern times, beginning with the theatre. Since the Elizabethan theatre the world of fiction puts on stage deception and dissimulation, the contrast between the declared intentions and the real ones, between appearance and social reality: In the terms of Samuel Butler: "A Player (...) the more he dissembles, the more he is in earnest, and the less he appears himself, the truer he is to his profession". In the theatre, however, the deception is declared, the spectator knows it perfectly, and is in a condition where he observes not only the narrated stories, but also the intentions of the characters, the intrigues and the frauds. In the theatre and only in the theatre, then, he can (and must) see both sides of the matter: the pretension and the authentic datum.

These themes and this perspective, experienced first in the theatre, are then inherited and broadened by the novel, that at the beginning has precisely imposture as central topic, and that frees itself from the correspondence with the world in the search for another kind of realism: the modern novel doesn't pretend to reproduce the data of the world or the world in general, that appears by now non-transparent and often incomprehensible, but rather to create "second worlds" in which appears the multiplicity of intentions and perspectives. The realism of the novel, that narrates entirely reasonable stories of absolutely normal people, therefore, doesn't have anything to do with imitation: everybody knows that the characters are invented, while reality itself is never so compact, coherent and meaningful as in the romantic fiction. Fictitious reality is not fiction of reality, but "fiction of the reality of realities" (Blumenberg) - it reproduces the conditions in which something appears realistic, that normally in the world can never be observed. To be realistic, therefore, the novel must necessarily not to be real.

This produces the extremely concrete real consequences of fiction: the availability of an alternative fictitious world allows to get detached from the only real world, to observe it "from the outside" and to compare it with alternatives, that become real in their consequences. Since *Don Chisciotte* we know very well that the relationship with reality is modulated and conditioned by the experience of the fiction, with the difference that the by now consolidated legitimation of the novel has lost the connotation of illusion and deception. *Don Chisciotte* was crazy, or appeared crazy, while today the one would be strange who has not experience of fiction and doesn't know how to move in the game of masks and authenticity. The fiction becomes the mirror in which society reflects its own contingency, the normality of a world that cannot be univocal and determined any more.

The Baroque uncertainty, however, didn't concern only dissimulation and deception in the relationships among people, but also a new and constitutive lack of certainty in the relationship with things. In most cases one cannot be been certain, but nevertheless one has to act and to decide: is it possible to elaborate models of rationality for these situations? The interest for probability arises from the search for a calculus of reasonableness (not of truth nor of demonstrative certainty) for cases of defective knowledge, located in the space between the two poles of absolute certainty and total doubt - an attempt that, according with the generality of the problems, around 1650-60 concerned a large group of researchers in very different fields, often engaged in the typical reflection of the "moralists" of the century: besides Pascal and Fermat, Huygens, Leibniz, Wilkins, the authors of Port Royal and many others.

They recognize ignorance and begin to study it as a specific object worth of interest. The probability at its beginnings studies the human error, not the nature, and opens thereby a new enormous field of investigation – that, as the world of fiction, deals with a reality alternative to the simple data of the real reality (that obviously has nothing to say about the ways, the forms and the criteria of error). As fiction is not simply a lie, even if it deals with things and events that are not true - and one knows it - so probability deals with errors not as simple mistakes, but as a field that can reveal its own principles and regularities: "Probability in this sense is a rational way of assessing our own state of imperfect knowledge" (Smithson 1989). Probability theory is placed precisely in the intermediary space between truth and opinion, between apodictic knowledge and mere persuasion, and individuates a field in which "to be uncertain was not necessarily to be irrational" (Daston 1988): a different dimension of reality, or in our terms a specific way of reality doubling.

The problem is first of all the relationship with the future that introduces a radical insecurity, not limited to the humans who cannot access the ultimate order of things. The future is unknowable as such, because it doesn't already exist, and nothing guarantees that the knowledge drawn from the past will give us indications to face, or even to foresee, the forms the future will assume. This lack of continuity also implies that it is not at all certain that the way the future appears today (the present future) coincides with what will actually get real in the course of time (the future presents): this is the real meaning of the idea of open future. And the perspective of future of the future present will itself be different from what appears today, while presumably our present, that will then be past, will appear in turn different from what we experience now. In this view the increase of information and knowledge of the past offers no help, or helps only to get ready to face something of which we can only know that it will be different: one can only get ready to wait for surprises - a situation that, as all paradoxes, is devoid of any contents.

How can one face this indeterminacy that, as such, can become paralysing? How can one move from the present to the future? Moving blind or according with some form of decisionism – i.e. an, in itself, uncontrollable way, that increases enormously the contingency and uncertainty in the social dimension? If one looks for some form of consent one needs instead a form that makes decisions if not completely

rational at least understandable for the others – one would need a criterion that directs the orientation to the future, and that can also be communicated. The construction of probability belongs to this field.

As we said above, probability is a way of reality doubling, i.e. the construction of a fictitious reality that is not in competition with the real reality, but constitutes so to say an alternative increasing the available complexity. The future presents will be as they will be, univocal but entirely unknowable; the present is not able to orient to them, and turns instead to the present future, that is something different presented in the form of the probable/improbable, that can be calculated and on which one can ground his forecasts. That it is a fiction is evident because the future presents will never appear as more or less probable but as they will be - not at 40% or 75%, but simply as they are: stating that it is *only* probability one implicitly recognizes it. But also in this case the fiction can be more informative than the (non-transparent) reality.

The orientation to probabilities has undoubtedly some advantages. First of all they can be calculated, and actually the calculus of probabilities has been developed contemporarily to the emergency of the idea of probability as such: uncertainty has been produced together with the means to control it. The certainty one gets, however, is not related to the world but related to the observer: since it is a fiction, it can give only very indirect and very uncertain information on what will happen, but it can furnish the observer and the decision maker with reliable criteria to direct their choices. In other terms: the real advantage of the calculus lies in its making (fictitiously) transparent the non-transparency of the future: one can calculate probabilities and decide accordingly, knowing that he will be able later to maintain to have calculated and acted right, even if reality occurs differently. Even if the future is and remains uncertain one has certain decisional foundations, on which one can expect to find also the consensus of the others: one can expect not to have to regret in the future the decision taken today, however the things will go, and also that the others won't have anything to reproach. That's why Luhmann can affirm that the calculus of probabilities, with its claims of rationality, takes the place of the old cosmological limitations: the constants of the being and the secrets of nature at the base of the order of the world.

Things, however, go as they go, and it is not at all certain that the indications drawn from the fictitious field of probability, however controlled and not casual, coincide with the real course of the world: but this was not even the intention of the calculus in its original formulation, conceived expressly as a "calculus of reasonableness" in order to mitigate the uncertainty of the observer – and that's what its criteria were referred to, that guaranteed equity of conditions for all observers and didn't concern the world at all.

The mathematization of probability, however, as it was developed later (since the end of the 19<sup>th</sup> century), tends to present it as a category of knowledge and not only as a calculus. The often quite un-reflected but very common idea spreads, that aggregated numbers and middle values serve to study the features of specific objects, characterized by an inherent variability – i.e. uncertainty is referred to the instability of the objects and faced with specific techniques, and no more to the limits of the observer.

Probability develops as a certain discipline to study uncertain objects, and not as a discipline of uncertainty (what it originally was).

As always happens, the change of meaning of the alternative reality changes also the interpretation of reality, in ways by now as widespread as to get almost unnoticed. Before the mid 19<sup>th</sup> century one lived in a world in which rates of growth, electoral surveys or forecasts of the internal product of the country didn't exist - "objects" that now populate steadily our world of reference. This change of attitude corresponds to a subtle and continuous shift in the interpretation of the formalization of the probable: the "science of the unknown", born as the opposite to the field of truth and certainty, aims today on the contrary at offering an equivalent of certainty, or at least a substitute for it. One doesn't study the errors and their rules anymore, but rather what are interpreted as the "laws" of random - certain criteria in an objectively uncertain field, a contingency independent from the observer.

The problem is that reality is unlikely - as one has always known, before the statistic drunkenness that characterizes us since a couple of centuries: also Aristotle thought that "it is likely that something happens against likelihood"; in other terms: it is probable that the unlikely occurs, and probability is accordingly very little realistic. The principal reason is that there are many people and everyone takes decisions - the existence of subjects means a constant "self-production of uncertainty": taking decisions one tries to absorb uncertainty, but at the same time creates new indeterminacy - for oneself and for the others. A world that includes decision-makers has an uncertain future, since it depends on what will be decided in the present, but multiplies it for the number of the decision-makers, each of them depends on the others, knows it, and tries to anticipate in his decision those of the others and their consequences - while obviously the others do the same, in a dizzy multiplication of indeterminacy.

Calculations and statistics, mathematizations and methods, allow to formulate forecasts that offer a direction in the indeterminacy of the future; their value, however, lies not in the correspondence to reality, that as for all fictions is not necessary and not even desirable, but rather in their realism, i.e. in the ability to present a transparent perspective, according to which one can build orientations, can discuss them and can look for the consent of others (finding it or not). Let's pick up once more the parallel with the novel, that presenting a realistic fiction allows the observers to build up expectations and analysis that the non-transparent real reality wouldn't allow, and that become then real in their consequences: everyone constructs his relationship with the world and with the others, his claims and projects on the basis also of the experiences made in the world of fiction. The same happens with planning: the perspectives of future drawn from probability can also be fictitious, but the observers use them in order to decide, and decisions become real facts, for the decision maker himself and for all the others - the future presents will certainly be influenced by them.

Forecasts, then, are not useful for the security they offer, because as we have seen in somehow complex fields with high-intensity of observation a good forecast is doomed to sabotage itself, but rather for the adaptation and correction capability that they make possible. One foresees and plans, and thereby

do things that can be observed. What then happens doesn't result from the planning as such, but from the fact that it is observed, that one infers the intentions and orientations of the ones making it, that one knows that also the others will take it into account, and that the planner himself eventually observes how the planning is observed. One then can change it, can adapt to the circumstances, can learn from experience - but just because one has done something with reference to which information can be produced and gathered. The probabilistic forecast, therefore, is not a (more or less successful) determination of the future, but a "going concern" on the basis of provisional forecasts, done in order to be continually adapted and revised - but this can be done and allows to prepare to the future one builds.

My impression, that here I can only mention, is that economic theory is a sector that shows evidently the real effects of the probabilistic fiction, even if it is not always clear that it is fiction - and here arise a series of problems, that economists are the first to complain of. About the foundations of economic theory an lively debate is notoriously in progress since several years, involving various topics as the conception of rationality, the relationships with the other social sciences, the role of formalization and information and the very idea of theory (in the somehow artificial opposition of rigor and empirical utility). The real problem, and the circumstance preventing economists to acknowledge their distortions, would lie however in their incapability to recognize their fictions as such. The economists themselves say it (who are the most sharp critics of the setting of economic theory): according with von Mises the principal limitation of the mathematical economists is that they take for "something really existing" the artificial states they themselves built in order to be described with mathematical methods. According with Akerlof economy is "blind and insane" because the economists, rather than considering their models as grounds for comparison to observe the real world (that will usually be different from the model) "often believe that the economic model is the real world"; this misunderstanding leads to much too simple approaches, producing false empirical forecasts. The quotations could be multiplied at will.

But why all this blindness and stubbornness? A current of opinion in economic theory, critical of the orthodox approach but by now sufficiently stabilized to be honoured by several Nobel prizes, related with names like Stiglitz and Akerlof, maintains that the main error is the assumption of perfect information, supporting several simplifications like the (otherwise impossible) efficiency of the markets, the tendency to equilibrium, the rationality of the operators. In our terms: the main error would be the naïve trust in the idea of probability, that leads to build up models in accordance with the probabilistic logic of a range of given possibilities (the balls in the urn), whose configurations are more or less predictable according with the abilities and knowledge of the observer: the more they increase the more one gets close to perfect knowledge, while probability measures the degree of our ignorance. Following this approach one can build models, can translate them in mathematical form, can make calculations and formulate forecasts; the problem is however that apparently in the functioning of the markets information is never perfect, and

it would not be even desirable that it were. All models and formalizations, then, if they are useful for something, this is certainly not to describe the real operations of the economic processes.

This has been observed some time ago by Frank Knight, periodically rediscovered as reference for a revision of economic theory: the approaches relying on equilibrium and rationality are based on unilateral simplifications of reality. In taking their decisions the operators don't think only at what they want to get, but also at how their decision will influence the beliefs of the other operators (about the market, about themselves, and about their way of observing the market); in some cases they will try to limit the diffusion of information, in other cases they will use it to transmit additional information (for instance not selling stocks of their own firm to avoid to give a negative signal on their perspectives of growth). This kind of imperfect information is very difficult to model, but it is in no way defective and incomplete, and is not at all without consequences: it is useful precisely because it is imperfect and allows us to observe what is not (still) real. In our terms: the orientation to probabilities doesn't eliminate the uncertainty but makes it manageable producing further possibilities in a somehow controlled way; the manifold forms of "imperfection" correspond to the variegated ways in which this form of fiction is used, that even if not true is not at all arbitrary. And as fiction has very concrete real consequences, so this imperfect world of derived information becomes extremely and at times tragically real in the concrete practice of the markets: a world made also of forecasts, statistics and formalizations, that are used however as clues for producing information, rather than as information themselves - as fictions, and not directly as reality. And it is this kind of information that escape modelling, without negating the usefulness of formalization and the interest of calculation – but still the "self-generated uncertainty" seems destined to remain uncertain, and is useful precisely because of that.