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PREFACE

Paola Monari

Fifty years have passed since the death of Corrado Gini. *Statistica* wishes to mark this anniversary with a twofold aim: to republish a number of Ginis essential papers which in spite of their scientific importance have not had the necessary exposure in English, and to bring together a number of papers by University of Bologna researchers who have further explored some of Ginis themes beyond strictly methodological aspects. Ginis contributions to the measurement of economic inequalities are well known and have been written about recently by several contributors to this journal[1]. Less well known are his papers on the measurement of transvariazione, which became fundamental for a number of original developments in multivariate statistical analysis, and even less well known are his essays on probability and on statistics as an inductive method[2]. Ginis long research career was bound up with decisive political and private events. These include World War Two, which greatly hindered relations between warring nations and scientific contacts as a result too, and the public commitments taken on by Gini as President of the Central Statistical Institute. Furthermore, at the time Fishers (rightly) became the dominant approach to statistical inference, while calls to reflect critically upon these methods within the sphere of inductive logic and probability calculus met with little interest. In more recent times, Ginis writings have regained all of their fascination and in 2001 this Journal published a volume collecting 11 of his essays on the subjects of probability and statistical induction produced between 1911 and 1964[3]. I would like to take up a part of the preface that Italo Scardovi

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[1] C. Dagum (2006), *Wealth distribution models: analysis and applications*, Statistica, LXVI, 3.

[2] D. Costantini (1979), *Il metodo dei risultati e le ipotesi profonde*, Statistica, XXXIX, 1.
A. Montanari, P. Monari (2008), *Ginis ideas: new perspectives for modern multivariate statistical analysis*, LXVIII, 3-4.

[3] C. Gini (2001), *Statistica e Induzione/Induction and Statistics*, a cura di P. Monari e D.Cocchi, Biblioteca di Statistica, Clueb, Bologna, 2001. The Ginis paper published both in original text and in English translation are the followings: Consideration on a posteriori probability (1911), The danger of statistics (1939), Regarding the "tests of significance" (1943), The tests of significance (1943), On the logical basis and gnoseological importance of the statistical method (1946), Rereading Bernoulli (1946), From the sample variability index to the mass variability index (1946), Sample means (1947), Characteristics of the most recent development in statistical methodology (1950), Methodological postilla (1961), The inductive applications of probability theory (1964).

wrote on the occasion of the publication of the Gini collection on Induction and Statistics. Italo Scardovi was the editor of this Journal for many years and was intimately acquainted with Corrado Gini, who always supported him scientifically and appreciatively.

"The *Considerations on a posteriori probability gives* a coherent layout to a fundamental problem of inductive logic. Of that rational reconstruction of probabilistic inference, beyond Laplace's succession rule, Domenico Costantini grasped all the originality in comparison with the studies on inductive logic which are usually assumed to have been stared by Carnap (half a century later!). Gini's is a general formulation, in the finite, that makes the conventions established by Laplace nothing more than unreal limit conditions, and it reaches the inverse probability on the Bayesian-Laplacian model, overcoming the rigidity of the equality of *a priori* probabilities (even more so if of infinite causes), postulated in Bayes' Scholium. The Ginis intuition consists in assuming, for prior probability, a "beta" type distribution that the Fisherian Edwards suggested in a letter to Gini, that it should be called "Gini's distribution" and in introducing the "method of results (direct and indirect)" for the determination of the a priori probabilities according to the statistical frequency obtained from statistical data: it is, in fact, one thing to make up for the lack of information by postulating its indifference, and quite another to base inductions on experience data: i.e. the "results". Which, Costantini suggests, are nothing more than the famous "structure-descriptions" adopted by Rudolf Carnap in his "Inductive logic" one of the fundamental concepts in his well-known "Logical foundation of probability" (Chicago, 1950). Gini's work was therefore that of a precursor, a great precursor who, as precursors do, anticipated theories that would come later, many years later; and he went beyond them, so far beyond that he foreshadowed the foundation that was to support the so-called "empirical Bayes methods". [D. Costantini, *Il metodo dei risultati e le ipotesi profonde*, Statistica, XXXIX, 1979]. The last essay of this anthology, *The inductive applications of probability theory*, reproduces the speech Gini made at the ceremony in honor of his eightieth birthday. Having had the privilege of participating and the even greater privilege of listening to the Master's reflections whilst he prepared it, I always reread those pages with emotion. He told me that he had noticed, not without surprise, while consulting one of his early unpublished works on the theory of probability, that his opinion had not changed since all those many years before: "I noticed with great relish", he wrote at the beginning of the text, "that almost sixty years on, my thoughts had remained unchanged". A happy reunion with his first love, the theory of probability, just as in an old adagio, recalled in the first line of the first page "On revien toujours aux premieres amours". In that speech, Gini reworks the origins of the theory of probability as an inductive tool, continuing the acute distinction between formal developments anti empirical inductions the ambiguity behind the misunderstanding between Bernoulli and Leibniz and finds the methodological results of Quetelet and Lexis in an inductive key, respectively for the measurable variables and the enumerable ones. It outlines the logical formal coherence and points out the interpretative improperties. "Both the conclusions of Quetelet, and those of Levis he remarks were incorrect, but this does not belittle their merits". He goes on "Of all things,

the beginning is the most important and therefore the most difficult part, but to add to it is easy, Aristotle once so rightly said with a sentence that Tartaglia was to assume as his motto. It is this sentence and here Gini allowed himself a little malice that many modern statisticians should remember, they who believe themselves superior to their predecessors for having added something to the methods that others introduced, like flies sitting on the head of an eagle that boast that they fly higher". In that speech, Gini concludes with the subtle question on where the logical leap is in passing from, the combinatory (where chance has no place) to the aleatory."

In addition to the two papers discussed by Scardovi, the volume contains two papers by Gini: *Rileggendo Bernoulli [Rereading Bernoulli]* (1946) and *Intorno alle basi logiche e alla portata gnoseologica del metodo statistico [On the logical bases and gnoseological importance of the statistical method]* (1946) in which Gini seems to position himself 'outside' his own era. This is not the case. Gini was always very much up to date with the latest developments in statistical methodology and especially in statistical inference. The onslaught of Fisher's approach and above all the shift towards statistical decision theory ushered in by Neyman and Wald fuelled his doubts concerning the logical consistency of these new methods and led him to return to a discussion of the concept of probability, chance and the ambiguous alternation between deductive and inductive reasoning. For example, Gini strongly objected to the idea that the (strictly deterministic) combinatorial space of events can be assumed to be a random set of possible states on which probability distributions and statistical tests can be constructed. These reversals have become established practice in statistical inference and have contributed to the success of theoretical and applied scientific research. Nevertheless, returning to these fundamental topics and to a rereading of the major figures who laid the groundwork for the calculation of probabilities and the initial outlines of statistical inference can only lead to new knowledge and fresh ideas for the development of the statistical method.

Ginis advice in reference to Bernoulli still stands today: "Reading classics is useful, not only in order to learn, but because it takes us back to the origins of the doctrine, it allows us to explain founded or unfounded positions assumed by authors who followed them, sometimes better than the same authors can explain".

We are convinced that the same is also true for a rereading of Corrado Ginis "philosophical" writings.