

## CORRADO GINI AT CAGLIARI UNIVERSITY: AN OVERVIEW

**Giuseppe Puggioni**

*University of Cagliari, Italy<sup>1</sup>*

**Abstract:** *The four years Corrado Gini spent at the University of Cagliari – 1909 to 1913 – represent a very small part of his long academic and intellectual career, but it can be argued that they rank among the most fruitful with regard to his lasting scientific contributions. After reviewing the institutional and didactic dimensions of Gini’s stay in Cagliari, we will offer a brief analytical overview of the statistical and social-scientific research activities he conducted during this short span.*

**Keywords:** *Corrado Gini, University of Cagliari*

### 1. INTRODUCTION

In the 1909-10 Yearbook of Cagliari’s Royal University, one can read that Corrado Gini, who had obtained the *libera docenza* (basically, the right to teach) a year earlier at the University of Bologna, became the university’s first *professore incaricato* – or lecturer – in statistics in the Faculty of Law on November 16, 1909, at an annual salary of two thousand lire.<sup>2</sup> Almost exactly a year later, on the occasion of his November 7, 1910 inaugural speech, Cagliari’s *Rettore* (Rector) Professor Pio Colombini (from the Medical Faculty), stressed how young Professor Gini had fulfilled “with great honour” his teaching duties as *lecturer* in statistics. And a few weeks later (November 1, 1910), Gini was officially elevated to the rank of *professore straordinario* – or adjunct professor – in statistics, after having been unanimously recommended by the commission formed to conduct the contest.<sup>3</sup>

At about the same time, he was also nominated as a *referendario* (consultant) for the *Consiglio Superiore di Statistica* (Higher Council of Statistics), a fact Cagliari University’s 1910-11 Yearbook did not forget to mention and which

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<sup>1</sup> Email: [gpuggion@unica.it](mailto:gpuggion@unica.it).

<sup>2</sup> Before Gini was recruited, the course in statistics was taught by Enrico Presutti, who had just moved to Perugia as *professore straordinario stabile* in Administrative Law and Administrative Science.

<sup>3</sup> It was composed of Rodolfo Benini, Pasquale Jannaccone, Francesco Coletti, Giulio Salvatore Del Vecchio and Giovanni Battista Salvioni, all undoubtedly major names in the discipline at that time.

testifies of his reputation's meteoric rise. Then, in November 1913, Professor Otto Casagrandi, at that time Cagliari's *Rettore*, announced that Gini had left Cagliari, following his success in the contest for the University of Padua's prestigious chair of statistics. Casagrandi commented: "(Gini) has left us with the assurance that he will always remain with us thanks to his useful work".

During the four years he remained at Cagliari, Gini maintained a conscientious and active presence in the institution, as testified by his regular presence at meetings of his Faculty's council.<sup>4</sup> Interestingly, it was Franco Savorgnan that succeeded Gini in his Cagliari chair, as he would also, in 1932, replace Gini in his functions as President of Italy's Central Institute of Statistics (Istat) and Higher Council of Statistics.<sup>5</sup>

## 2. GINI AS PROFESSOR OF STATISTICS

At that time, statistics was a basic subject in the first-year curriculum in Law (*Giurisprudenza*), together with courses on civil law institutions, constitutional law, the history of Roman law, and political economy. During Gini's four years in Cagliari, students registered in the Faculty of Law amounted to about half of the university's total enrolment and 25,3% of them graduated overall. On a total of 94 first-year students registered during those four years, 73 underwent the statistics' exam.<sup>6</sup>

For a number of these students, learning statistics also meant doing original research and taking part in the master's own scientific inquiries. Among the three students who were received with high distinction (*cum laude*), two (Vladimiro Doglio and Giuseppe Marchegiano) did help Gini in the preparation of his 1910 monograph "On the variability of the two sexes at birth and at adult age" (*Sulla variabilità dei due sessi alla nascita e nelle età adulte*) and had their names mentioned before the title (along with others). Gini regularly took part in commissions set up to examine more advanced students. In November 1911, for instance, he

<sup>4</sup> From the minutes of the 46 meetings held by the Faculty of Law Council between July 3, 1910 and November 16, 1913, we can observe that Gini was present on 37 occasions and acted as secretary no less than 33 times. Minutes from meetings held prior to July 1910 could not be found in the archives.

<sup>5</sup> Franco Rodolfo Savorgnan was nominated as *professore straordinario* in 1914, but, due to the war, he did not resume his teaching activities before 1919.

<sup>6</sup> Among those students of the Faculty of Law that did follow Gini's courses was Emilio Lussu, who was to be many times decorated during the war and would become an eminent Anti-Fascist politician, a well-known Sardinian writer and, later on, a founding member of *Giustizia e Libertà*.

acted as a referee for Emanuele Porru's thesis entitled "Concentration of wealth in various Italian regions" (*La concentrazione della ricchezza nelle diverse regioni italiane* – from which Gini would draw quotes in his own work after that, as we shall see). In July 1912, he also refereed for Iser Medda's "Woman's occupation in censuses from 1861 through 1901" (*Dell'occupazione della donna attraverso i censimenti 1861-1901*). In a publication entitled "Some documents on the distribution of patrimonies according to age in early 19<sup>th</sup>-century Sardinia" (*Alcuni documenti sulla distribuzione dei patrimoni secondo l'età in Sardegna al principio del secolo XIX*), another student, Giovanni Dolia, thanked Gini for having provided "direction and norms" for his work.<sup>7</sup>

### 3. GINI AS A SCIENTIST

Gini's four years at Cagliari were extraordinarily fruitful with regard to his scientific activity. During this very short span of time, he provided seminal contributions to some of the major lines of research he would develop in later decades. Notwithstanding his own outstanding intellectual capacities, such productivity was due in part to his capacity in coordinating scientific work: at Cagliari, he thus set up the first *Laboratory of statistics*, a collaborative structure he would replicate on the occasion of his later academic appointments, in Padua and Rome.

We shall present here the list of Gini's papers and monographs published during his stay in Cagliari, dividing it along various categories and highlighting both their significance and the input that can be attributed to the scientific environment he had created there.

#### (a) *Scientific logic*

1. "Intorno al metodo dei residui dello Stuart Mill e alle sue applicazioni alle scienze sociali", *Studi Economico-Giuridici della Regia Facoltà di Giurisprudenza di Cagliari*, Cagliari, Dessi, Vol. II, 1910, p. 89-108. ("On Stuart Mill's residuals' method and its applications to social sciences")

#### (b) *Probability*

2. "Considerazioni sulla probabilità a posteriori e applicazioni al rapporto dei sessi nelle nascite umane", *Studi Economico-Giuridici della Regia Facoltà di Giurisprudenza di Cagliari*, Vol. III Parte III, 1911, p. 77-113. ("Considerations on a posteriori probabilities and applications to the sex ratio of human births")

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<sup>7</sup> Dolia's research was published in *Studi economico-giuridici della Regia Facoltà di Giurisprudenza di Cagliari*, Cagliari, Dessi, Vol. II, 1910.

**(c) Concentration and dispersion**

3. *Indici di concentrazione e di dipendenza*, Biblioteca dell'Economista, 5th series, UTET, Turin, 1910, 151 p.; previously published in *Atti della Società Italiana per il Progresso delle Scienze*, Roma, Bertero, 1910. ("Concentration and dependency indexes")
4. *Variabilità e mutabilità. Contributo allo studio delle distribuzioni e delle relazioni statistiche*, Cuppini, Bologna, 1912, 157 p.; previously published in *Studi Economico-Giuridici della Regia Facoltà di Giurisprudenza di Cagliari*, Vol. III, Part II, 1911. ("Variability and mutability. Contribution to the study of distributions and statistical relationships")

**(d) Economic measurement**

5. "Prezzi e consumi", *Giornale degli Economisti e Rivista di Statistica*, 40, 1, 1910, p. 99-114. ("Prices and consumption")
6. "L'equazione dello scambio e il potere di acquisto della moneta", *Rivista Italiana di Sociologia*, 17, 2, 1913, p. 219-232. ("The exchange equation and the purchasing power of money")
7. *L'ammontare e la composizione della ricchezza delle nazioni*, Torino, Bocca, 1914, 709 p. ("The amount and composition of the wealth of nations")

**(e) Demography and eugenics**

8. "Il sesso dal punto di vista statistico. Le leggi della produzione dei sessi", Remo Sandron Editore, Milano-Palermo-Napoli, 1908. ("Sex from a statistical point of view. The laws of production of sexes", which is a reprint of Gini's award-winning dissertation [*tesi di laurea*].)
9. "Sulla variabilità dei due sessi alla nascita e nelle età adulte" (coll'aiuto dei signori G. Marchegiano, R. Ciuffo, F. Viola, V. Illario e V. Doglio, allievi dell'Istituto Economico Giuridico della R. Università di Cagliari), *Studi Economico-Giuridici della Regia Facoltà di Giurisprudenza di Cagliari*, Cagliari, Dessì, 1910. ("On the variability of the two sexes at birth and at adult age")
10. "I presupposti statistici della teoria della cernita naturale", *Rivista Italiana di Sociologia*, 14, 2, 1910, p. 205-221. ("The statistical presuppositions of natural selection theory")
11. "Sui fattori demografici dell'evoluzione delle nazioni", *Rivista Italiana di Sociologia*, 15, 5, 1911, p. 530-563. ("On the demographic factors of the evolution of nations")
12. *Ifattori demografici nell'evoluzione delle nazioni*, Torino, Bocca, 1912, 142 p. ("Demographic factors in the evolution of nations", which is a revised and expanded version of title 10.)

13. “Contributi statistici ai problemi dell’Eugenetica”, *Rivista Italiana di Sociologia*, 16, 3, 1912, p. 317-426. (“Statistical contributions to the problems of eugenics”)
14. “The Contributions of Demography to Eugenics”, in *Proceedings of the First International Congress of Eugenics*, vol. II, London, 1912, p. 294-334. (Translation of the latter title – but note the change from “statistics” to “demography”).

Among this abundant production, maybe the 1911 paper on a posteriori probabilities (number 2 in the above list) stands out as both not very well known and especially significant. According to I. Scardovi, Gini regarded it as the most precious of all his papers.<sup>8</sup> Scardovi himself sees the work as “foreshadow(ing) the foundation that was to support the so-called ‘empirical Bayes methods’ ”.<sup>9</sup> The same judgment was amply argued and documented by D. Costantini in a 1994 essay appropriately entitled “Corrado Gini on the shoulders of Bayes and Laplace” (“*Corrado Gini sulle orme di Bayes e Laplace*”). But Costantini explains that “the importance of that work has been largely misconceived” for two reasons: first, attention was drawn to the second part of the essay, which dealt with sex ratio at birth, a problem to which Gini had already devoted considerable attention, rather than to the first one, dedicated to the logical foundations of probability;<sup>10</sup> and the fact that it was published only in Italian at a time when English was becoming the discipline’s universal language also curtailed its dissemination.<sup>11</sup>

The two monographs on concentration and variability (3 and 4) built and generalized issues first addressed in Gini’s earlier “Differing growth of social classes and the concentration of wealth” (“Il diverso accrescimento delle classe sociali e la concentrazione della ricchezza”, *Giornale degli economisti*, 38, 1, 1909, 27-83). And they were soon followed by the celebrated “On the measurement of concentration and of the variability of characters” (“Sulla misura della concentrazione e della variabilità dei caratteri”, *Atti del R. Istituto Veneto di Scienze, Lettere ed Arti*, T. XXIII, Part II, Venice, 1914), in which Gini developed R, the concentration ratio for which he has earned an enduring place in the pantheon of statistics. Given the amount of data elaborated in these writings, it is clear that Gini was able to mobilize the work of collaborators at Cagliari (and elsewhere) and, in his preface to “Variability and mutability”, he thanks notably G. Dettori, E. Porru, F. Speranza

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<sup>8</sup> I. Scardovi, “Preface”, in Gini, C., *Statistica e induzione/Statistics and Induction*, Bologna, CLUEB’ 2001, p. xix-xx.

<sup>9</sup> *Ibid.*, p. xxiv.

<sup>10</sup> Costantini, D., “Corrado Gini sulle orme di Bayes e Laplace”, in *Le scienze matematiche nel Veneto dell’Ottocento*, Venice, Istituto veneto di scienze, lettere ed arti, 1994, p. 264.

<sup>11</sup> *Ibid.*, p. 271.

and A. Pino Branca, all students at the Institute of economics and law (*Istituto economico-giuridico*) or former students attached to his laboratory. Among the works quoted figures the published version of Emanuele Porru's above-mentioned thesis on "The concentration of wealth in various Italian regions" as well as Giovanni Dettori's "Contribution to the study of price variability" ("Contributo allo studio della variabilità dei prezzi"), also published in Cagliari University's *Studi economico-giuridici*.

The 1910 article on prices and consumption (5) has been hailed as a pioneering contribution to econometrics by Nobel Prize economist George J. Stigler in a 1954 paper on the history of quantitative economics (he characterized Gini's work as "notable for its breadth of vision") and also by Mary Morgan in her 1992 survey of *The History of Econometric Ideas*,<sup>12</sup> while the 1913 paper (6) has more recently been described as "a notable contribution" to the discussion on American economist Irving Fisher's quantitative theory of money.<sup>13</sup> By contrast with these short and theoretically-oriented pieces, *The Amount and Composition of the Wealth of Nations* is a massive compilation that addresses in an exhaustive manner the issue of measurement of national income. Even though it was published just after Gini left Cagliari, work was completed during Gini's tenure at Cagliari, the preface being dated November 1, 1913.<sup>14</sup> Here again, Gini mentions both Porru and Dettori as having taken part in calculations as well as in the manuscript's revision, and Porru's thesis was again quoted.

Gini's writings on demography and eugenics are those that have had the most controversial destiny. This is due, in the case of demography, to the role played by population policy under the Fascist regime and the difficulty for such a discipline to remain immune from political contamination.<sup>15</sup> In the case of eugenics, the

<sup>12</sup> G. J. Stigler, "The Early History of Empirical Studies of Consumer Behavior", *The Journal of Political Economy*, 62, 2, 1954, p. 107; Morgan, M. S., *The History of Econometric Ideas*, Cambridge, Cambridge University Press, 1990, p. 139.

<sup>13</sup> Pavanelli, G. *Aspetti della teoria neoclassica in Italia tra Otto e Novecento: la ricezione del contributo di Fisher*, Working Paper no. 01/2003, Dipartimento di Economia "S. Cogneetti de Martiis", Università di Torino, p. 26.

<sup>14</sup> It may be mentioned here that, in its section devoted to publications by the university's personnel, Cagliari University's Yearbook gives 1912 as the publication date of *L'ammontare e la composizione della ricchezza delle nazioni*. And in the monograph version of *I fattori demografici nell'evoluzione delle nazioni*, dated 1912, one can also find a reference (p. 73, n. 2) to *L'ammontare* with 1911 as the publication date (and always Bocca as the publisher). However, we have not been able to physically locate any copy of these apparently earlier versions. In any scenario, *L'ammontare* is clearly a Cagliari writing.

<sup>15</sup> For an overall view, see C. Ipsen, *Dictating Demography, The Problem of Population in Fascist Italy*, Cambridge, Cambridge University Press, 1996.

experience of Nazi Germany, but also legislation in a number of Anglo-Saxon and Nordic countries, have deeply tainted any association with that word. Gini's writings on these topics during his Cagliari years, especially (10), (12),<sup>16</sup> (13), and (14), anticipate his later elaborations, notably that of a cyclical theory of population, founded on the idea of a biological decline of the reproductive instinct.<sup>17</sup> If the whole substantive theoretical framework of Gini's "neo-organicism" has now been largely discarded, the attempt to connect demographic, social and economic developments on the basis of data analysis was commendably ambitious.

#### 4. CONCLUSION

Overall, Gini's four years at Cagliari may be seen as seminal with regard to all aspects of his later path. It was there that he began teaching statistics as a practical pursuit that implied for students to have first hand contact with data and he accordingly had a number of them taking part in his own work. At Padua and, later, at Rome, he would implement this model on a much larger scale. It was also during that period that he first became connected to Italy's public system of statistics, as a *referendario* to the Higher Council of Statistics. Finally, on the methodological and theoretical levels, it was during those years that he produced pioneering contributions in all the basic domains to which would be later associated.

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<sup>16</sup> Student collaboration is also signalled here: "Il Signor P. Viola, allievo dell'Istituto economico-giuridico ha ottenuto (...) i risultati seguenti" (*I fattori demografici*, p. 30).

<sup>17</sup> G. Caselli, From Gini's Approach to Present-day Demography: "Tempo Effects" on Demographic Insights (?), *Journal of Statistical Science and Application*, 4, 1-2, 2016, p. 7.



**Figure 1. Central library of the University of Cagliari**



**Figure 2. Lecture Hall of the University of Cagliari**