Chapter 2
How Bourdieu "Quantified" Bourdieu: The Geometric Modelling of Data*

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Abstract There is an essential aspect of Bourdieu's work that has been somewhat neglected by those who have written about Bourdieu's theory, that is his constant concern for quantifying his data material and for putting his thinking in mathematical terms. The first purpose of this chapter is to provide landmarks for this aspect, and to outline the solution that was retained by Bourdieu, at least from La distinction onward: namely the geometric modelling of data. In a first part, this chapter describes Bourdieu's lifelong commitment into statistics (quantification and formalization), which lead him to the choice of geometric modelling of data through the use of correspondence analysis (CA) and multiple correspondence analysis (MCA). In a second part, examples of Bourdieu's modelling of the data are successively presented and analysed. Bourdieu's program for quantification and formalization is not an arbitrary result of historical contingencies: it is the logical consequence of a critical experience and reflection about the shortcomings of dominant quantitative approaches in social sciences, which led him to a conscious and systematic move toward a geometric frame-model more adapted to his conception of the social world.

2.1 Bourdieu and Statistics: A Lifelong Commitment

As early as the "Algerian times" (the second half of the 1950s, with a first book *Sociologie de l'Algérie* published in 1958), Bourdieu cooperated with statisticians of the Institut National de la Statistique et des Etudes Economiques (the French National Institute of Statistics and Economic Studies). He did it particularly during the collection of large-scale labour force surveys undertaken during the period of the liberation war in Algeria (until 1960 when he had to come back to France). Bourdieu applied his anthropological perspective to the sociological interpretation of survey data, especially the statistics of unemployment (Bourdieu Sayad, Darbel, & Seibel, 1963).

*This chapter is the result of a collective work undertaken since 1998 with Henry Rouanet and Brigitte Le Roux. Part of the ideas presented here was presented at the Correspondence Analysis and Related Methods (CARME 2007) conference of Rotterdam in June 2007.

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This collaboration continued in the 1960s at the Centre de Sociologie Européenne through multiple scientific exchanges, as reflected in the contribution to *Les héritiers* (Bourdieu & Passeron, 1964) by the statistician Alain Darbel, who is associated with the epoch-making calculation of the chances of access to university for the various social class categories. In *L'amour de l'art*, Bourdieu and Darbel (1966) develop the equations of the demand for cultural goods, where *cultural capital,* measured according to the level of diploma, appears as the central variable helping to explain inequalities in access to museums.

Between 1966 and 1971, Bourdieu elaborated theoretically the concept of field (Bourdieu, 1966, 1971); at the same time, he was becoming aware of the shortcomings of the traditional "quantification" tools, namely regression analysis, which he already makes clear in a chapter of *Le partage des benefices* (Darras, 1966) written with Darbel (under the title "La fin d'un malthusianisme").

As he would firmly state in *Distinction*, "the particular relations between a dependent variable (political opinion) and so-called independent variables such as sex, age and religion, tend to dissimulate the complete system of relations that make up the true principle of the force and form specific to the effects recorded in such and such particular correlation" (Bourdieu, 1979: 103).

To Bourdieu, social causality amounted to the global effects of a complex structure of interrelations, which is not reducible to the combination of the multiple "pure effects" of independent variables. The structural vision, which appears to be central for Bourdieu as for other social scientists in this period, relates to the strong influence of "structuralism" in French social sciences in the 1960s, especially with the models of linguistics and anthropology (around Levi-Strauss, who was a central reference for Bourdieu).

Bourdieu's strong interest for a new formalization also relates, though not explicitly, to the dynamics of mathematics under the influence of a well-known group of French mathematicians called "Nicolas Bourbaki", which was also an implicit reference-frame for sciences in general, and for specialists of the human and social sciences in particular. During this period, attempts for both formalizing and quantifying social sciences were numerous and largely inspired by various fields of modern mathematics (particularly algebra). Bourdieu himself often referred to the need for scientific instruments which would be capable of grasping the relational dimension of social reality.

Meanwhile, the geometric approach of data analysis developed by Jean-Paul Benzécri and his school around Correspondence Analysis was emerging (see Le Roux & Rouanet, 2004; Rouanet, 2006). At the end of the 1960s,[1] Bourdieu turned to this approach as being the method most in "elective affinities" with his own theory (Rouanet, Ackermann, & Le Roux, 2000). In *Distinction* ("A three-dimensional space"), Bourdieu develops the idea that if "quantification" is to take place in sociological research, it has to be multidimensional and aim as a first step at operationalizing each

[1] A first empirical attempt with CA is evoked in a footnote of *Un art moyen (Middle-Brow Art)*, a book which presents the results of a survey about photography. It seems clear that Bourdieu was not completely convinced by this first application, but he remained eager to find a model of the multidimensional social aspects of taste, which were not made visible with a series of contingency tables.

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of the basic dimensions of social space, namely the various types of capitals (e.g., economic, cultural, social and symbolic). The next step would be to combine them so as to provide a geometric model of data. Bourdieu stated "I use Correspondence Analysis very much, because I think that it is essentially a relational procedure whose philosophy fully expresses what in my view constitutes social reality. It is a procedure that 'thinks' in relations, as I try to do with the concept of field".[2]

A breakthrough in Geometric Data Analysis (GDA) was accomplished when Correspondence Analysis was applied to tables representing individuals by variables, synthesizing many contingency tables by two fundamental clouds: the cloud of properties and the cloud of individuals. More specifically, for categorized variables, Multiple Correspondence Analysis (MCA) emerged as a standard tool that was applied in "Le Patronat" (1978), *Homo Academicus* (1984), *La noblesse d'Etat* (1989b), *Les structures sociales de l'économie* (1990, 2000b), and, in a new [Au1] variant called specific MCA, "Une revolution conservatrice dans l'édition" (1999), Bourdieu's last quantitative empirical work.

Since the late 1970s, geometric modelling has been the basis of all empirical work conducted along Bourdieu's line. It has allowed Bourdieu to explore the major hypotheses of his theory such as: "the positions [in a field] command the position-takings" (Bourdieu, 1992). In his last lecture at College de France, in 2001, Bourdieu [Au2] reiterated: "Those who know the principles of multiple correspondence analysis will grasp the affinities between this method of mathematical analysis and the thinking in terms of field" (Bourdieu, 2001: 70).

This tradition of geometric modelling to quantify the basic dimensions of social space and explore sociological hypotheses, has been pursued in recent work directly inspired by Bourdieu's thinking: Sapiro (1999), Rosenlund (2000), Lebaron (2001), Duval (2004), Hjellbrekke et al. (2007), etc.

2.2 Bourdieu and the Geometric Modelling of Data

Bourdieu very soon developed a multidimensional perspective, which was already present in his early writings of the 1960s when he referred to *diverse* species of capital (economic, cultural, social, and symbolic). His scientific objective had been to counter-balance a purely economic vision of society (then becoming more popular under the influence of rational choice theorists like Gary Becker) and, at the same time, to contest a purely idealistic vision of the cultural domain by introducing an economy of symbolic goods (regarding this double move, see Lebaron, 2003). He tried to integrate both dimensions in the perspective of a "general economy of the practices" as he would write in 1972 in a theoretical essay, *Outline of a Theory of Practice*.

As early as in the middle of the 1960s, Bourdieu formulated the concept of "field", which systematically addresses the relational aspects of social reality (Bourdieu, 1966). He more completely developed his "theory of fields" in the beginning of the 1970s

[2] Preface of the German edition of *Le métier de sociologue*, 1991.

(Bourdieu, 1971). A field is a small locus inside the global social space, which is defined by its relative autonomy, and where its proper structure is related to a specific configuration of agents. Agents in a field, even without any direct interaction (in contradiction with Weber's vision of the religious universe), are put into objective relations, defined by the distribution of their specific resources and by a corresponding process of domination (distinct from the global process of social domination between classes).

The "geometric modelling of data" was a practical way to combine objectification through quantitative data in a synthesis of statistical information (which is relatively close to the classical use of factor analysis), and the notion of field, inserted inside the global social space.

2.3 L'anatomie du goût (1976) and Distinction (1979)

L'anatomie du goût (Bourdieu & de Saint-Martin, 1976) is the first published application of geometric data analysis methods in Bourdieu's work, republished in 1979 in *Distinction*. It was realised (like other applications in the 1970s and 1980s) with the help of Salah Bouhedja, Bourdieu's statistical technician, and (even if it was not mentioned in the text of the article) after some interactions with mathematicians and statisticians, who, for example, reacted to the first presentation of the results.

The data were collected through a survey on two complementary samples, using the same basic questionnaire, which was passed in 1963 ("Kodak survey", as it was called in the Centre de Sociologie Européenne) and 1967 ("taste survey"). This procedure aimed at producing a general sample able to give an appropriate picture of the French population.

The scientific objective of *L'anatomie du gout* was first to provide a synthetic vision of the social space as a global structure (which is presented on a "handmade" figure described as resulting from many successive correspondence analyses, hereafter CA). A second objective was to study two sub-sectors inside the social space more in-depth: the space of the dominant classes and the space of the middle-classes ("petite-bourgeoisie"), each study being based on the analysis of an Individuals by Variables table (from the respective sub-population).

The main elements of the geometric modelling of data were already present in this work, as Henry Rouanet, Werner Ackermann and Brigitte Le Roux have shown (Rouanet et al., 2000). Bourdieu and de Saint-Martin applied CA to Individuals by Variables tables, which was a common practice at the time, when the use of multiple correspondence analysis (hereafter MCA) was not yet developed.

The choice of active and supplementary variables[3] was subtle: questions on tastes and cultural practices were taken as active questions of the analysis; socio-demographic and occupational questions were used as supplementary questions, and figured on a

[3] Active questions (or variables) are questions which participate to the creation of the distance in the two spaces: space of modalities, space of individuals. Supplementary questions (variables) are projected onto the resulting space.

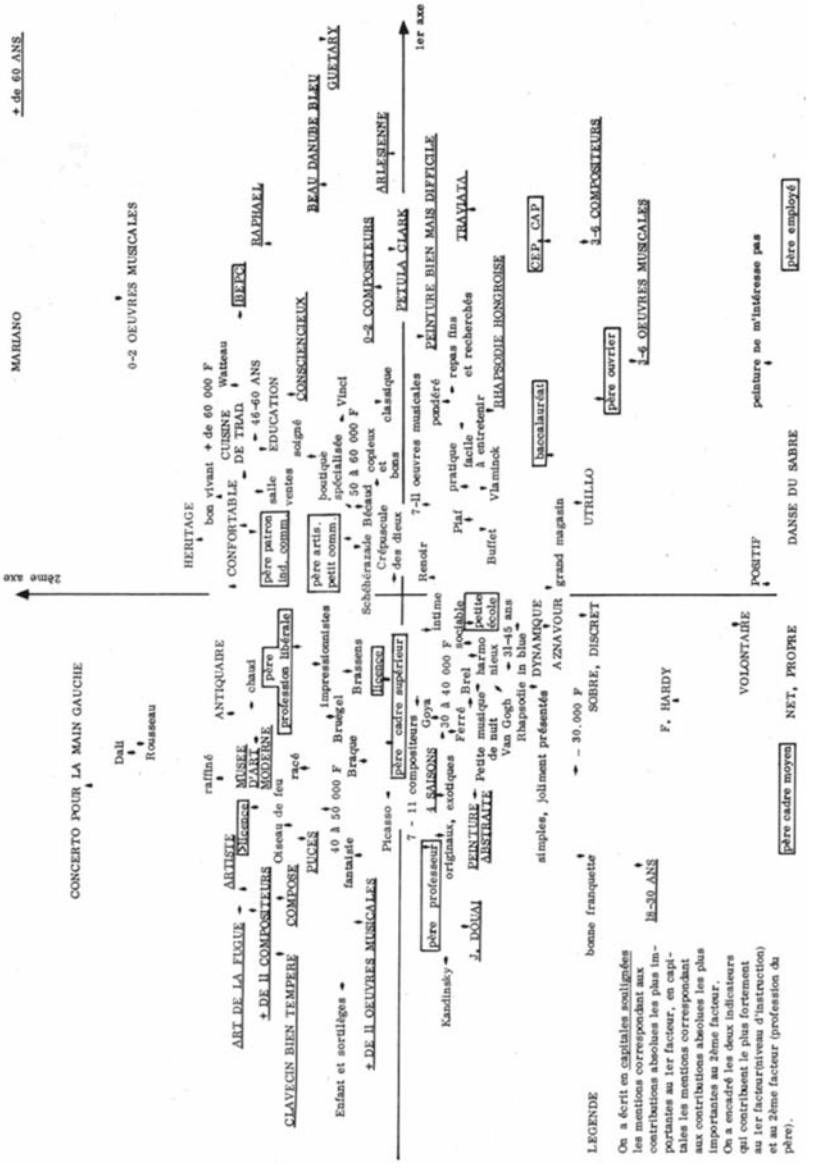

Fig. 2.1 Schema 3 "Les variants du goût dominant"

transparent which could be superposed to the first principal plan resulting from the CA. This technique of visualisation gives a strong intuition of the sociological relations between the space of tastes (lifestyles) and the space of social positions.

The cloud of individuals was present in the analysis: for specific fractions of the dominant classes, the dispersion of individuals was made obvious through the contours of various sub-clouds ("cadres", or "patrons") drawn by hand. This is what later will be called "structuring factors", the cloud of individuals being systematically structured by external factors in structured data analysis (Le Roux & Rouanet, 2004).

Species of capital are "fundamental dimensions" of the space to investigate; their combination (the first principal dimensions which are interpreted) is a specific result of the analyses. The resulting global social space in *L'anatomie du gout* is three-dimensional: the first three dimensions are interpreted in terms of the volume of capital, composition of capital, and seniority in the class. When referring to the space of the dominant classes or the "petite-bourgeoisie" (bi-dimensional), the first axes are interpreted in terms of capital composition and seniority in the class. The analysis results in a strong sociological statement about the existence of a structural homology between the "space of lifestyles" and the "space of social positions", both being interpreted as two aspects of the same reality (Fig. 2.1). [Au3]

Among today's research questions following this classical analysis is the problem of the universality of these two results in other (national or historical) contexts. For scholars like Lennart Rosenlund (2000), this configuration seems to be an invariant in developed capitalist societies, where the opposition between economic capital and cultural capital has become more pronounced.

2.4 "Le patronat" (1978) and *La noblesse d'Etat* (1989)

The second occurrence of a use of GDA by Bourdieu is a well-known article where Bourdieu and de Saint-Martin studied a population of economic elites (heads of enterprises, CEOs) with the help of MCA. In this article (republished in Bourdieu's *State Nobility*), the authors justify the central use of MCA as a way to discover a hidden relational reality which is not conscious, but nevertheless "more real" than the partial and practical perceptions of the agent. They refer to programs and publications from the statistician Ludovic Lebart.

The novelty of the analysis probably first lies in the type of data which were used. Biographical data were collected in various directories and biographical sources, in a collective process ("prosopography") directly inspired by growing scientific practices in social history (coming from ancient and medieval history). Here again, the main elements of the scientific practice of GDA were present in Bourdieu and de Saint-Martin's text. Active modalities were selected from a set of biographical data, defining the various species of capital at stake. These modalities were grouped into different "headings" (groups of questions), with an important number of modalities referring to social properties (from demographic characteristics to educational trajectory) and some of them to more specific assets in the economic

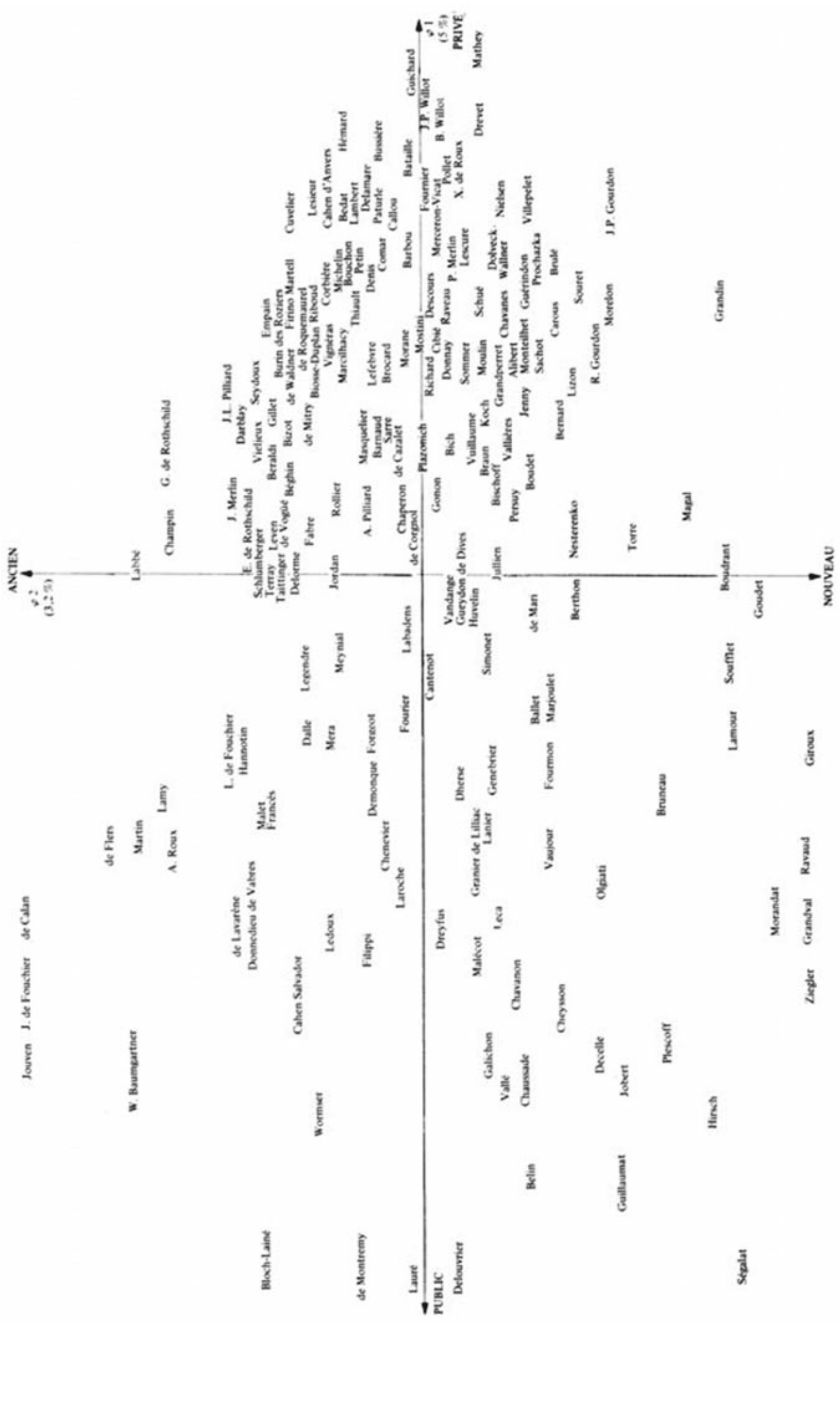

Fig. 2.2 Cloud of individuals, plane 1–2, p. 10

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field (positions in boards, distinctions, etc.). In particular, the following characteristics were considered:

- Demographic properties: place and date of birth, number of children, place of residence
- Social and familial origin: profession of the father, seniority in class, presence in the *Bottin Mondain* (a directory of social elites)
- Educational trajectory (i.e. "grand lycée parisien")
- Professional (career): (i.e. "grand corps")
- Specific positions in the field: economic power positions, membership to councils, etc.
- Indicators of symbolic capital: official distinctions, decorations, etc. and
- Indicators of membership to mobilised groups (like associations)

The cloud of individuals was explicitly given, with the names of elites helping the reader who "knew" some agents to have a direct intuition of the social structure of the field (Fig. 2.2). [Au4]

The interpreted space is two-dimensional, with a first axis opposing "public" to "private" positions and trajectories (the field then being dominated by technocratic managers, coming from Ecole nationale d'administration or Polytechnique) and a second axis opposing "newcomers" and "established". This analysis provides a strong view of the structure of the field of economic elites as being defined by the relation to the State (bureaucratic capital) and by a process of dynamic competition between fractions, first defined by their seniority in the field and correlated specific properties (the new "generation" in the field being more often trained in private business schools).

An explanatory perspective was clearly present in the analysis, which aimed at understanding the space of managerial strategies (for example, human resources, studied specifically in another MCA) in relation to their positions in the field. In *La noblesse d'Etat*, this analysis was combined to a general study and interpretation of structural homologies, especially those existing between the field of power in which the elite is included, and the field of "grandes écoles" (higher education institutions).[4]

2.5 Homo Academicus (1984)

In a prosopographical study – i.e., an analysis of the biographical properties of the members of a specific historical group – that began right after May 1968, Bourdieu and his group began to collect systematic information about academics in France. Their intention was to explain the specific crisis which took place inside the academic field during the May events (a general strike and student protests which had important political consequences), especially in the humanities and social sciences. This important amount of biographical information led to the construction

[4] The field of "grandes écoles" in the 1980s is studied with the help of CA in *La noblesse d'Etat*. The table is a contingency table crossing schools and professions of the father.

of two spaces resulting from two different analyses (MCA) published in 1984 (in *Homo academicus*): (1) a space of academics of all disciplines and (2) a space of specialists in humanities and social sciences ("lettres et sciences humaines").

Active questions were selected in both general social properties and specific position variables (indicators of symbolic capital, career, etc.). Position-takings (like public support to the director of Ecole normale supérieure, Robert Flacelière) were taken as supplementary questions. A cloud of individuals from "humanities and social sciences" was published with the initials of the names in French (and the full names in the English version).

Here again, an explanatory perspective was based on a close qualitative look at the cloud of individuals: position-takings in May 1968 (for or against the student's movement, the worker's strike, etc.) were related to specific positions in the field, with an opposition between traditionally established (orthodox) and modernist newcomers (heretics) as a central polarisation inside French universities.

2.6 "L'économie Domestique" (1990) and *The Social Structures of the Economy* (2000)

In the analysis of an economic field (the field of individual house in France), undertaken in the 1980s and first published in 1990, two analyses were presented: one described the "field of producers", and the other the "field of efficient agents" involved in the making of a public policy in this sector. Both were based on prosopographical data, the first about real estate enterprises and the second about individuals from different sectors of the field of power related to this sector of public action.

In the analysis of the "field of producers", the first axis is interpreted as an opposition between large national and small local companies, and the second as an opposition between two juridical structures of intermediary enterprises (with two related styles of production). This structure is used by Bourdieu to interpret economic strategies, largely depending on the positions in the field, especially the way the companies both anticipate and adjust to sectors of demand (or to sectors of the social space).

In both analyses, one finds again the clouds of individuals with names, sub-clouds of individuals with drawn geometric contours (as in *Distinction*) and an explanatory perspective (with as *explanandum*, respectively economic strategies and position-takings in the public policy debate). In *The Social Structures of the Economy*, Bourdieu insisted on this explanatory perspective made possible by GDA (Fig. 2.3). [Au5]

2.7 "Une Revolution Conservatrice dans l'édition" (1999)

This article was the last publication using GDA methods by Bourdieu himself, written in collaboration with Brigitte Le Roux and Henry Rouanet (following the Köln conference on the empirical investigation of social spaces in 1998, after

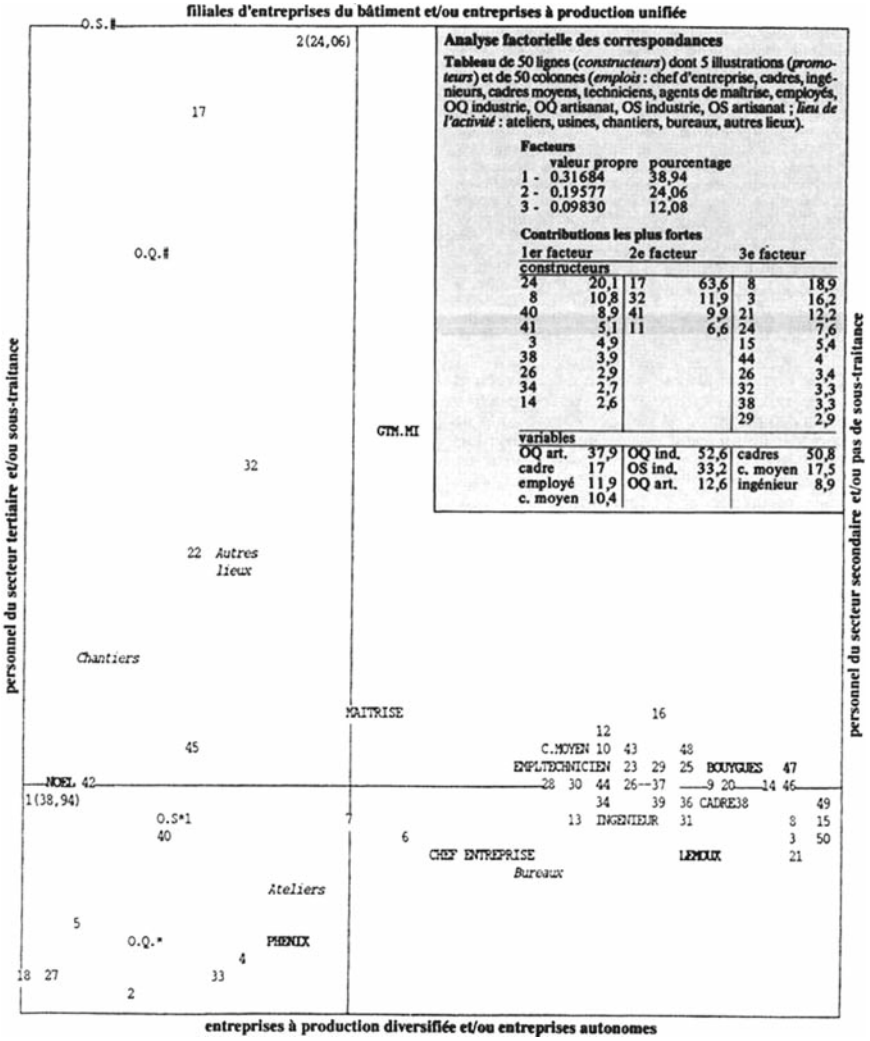
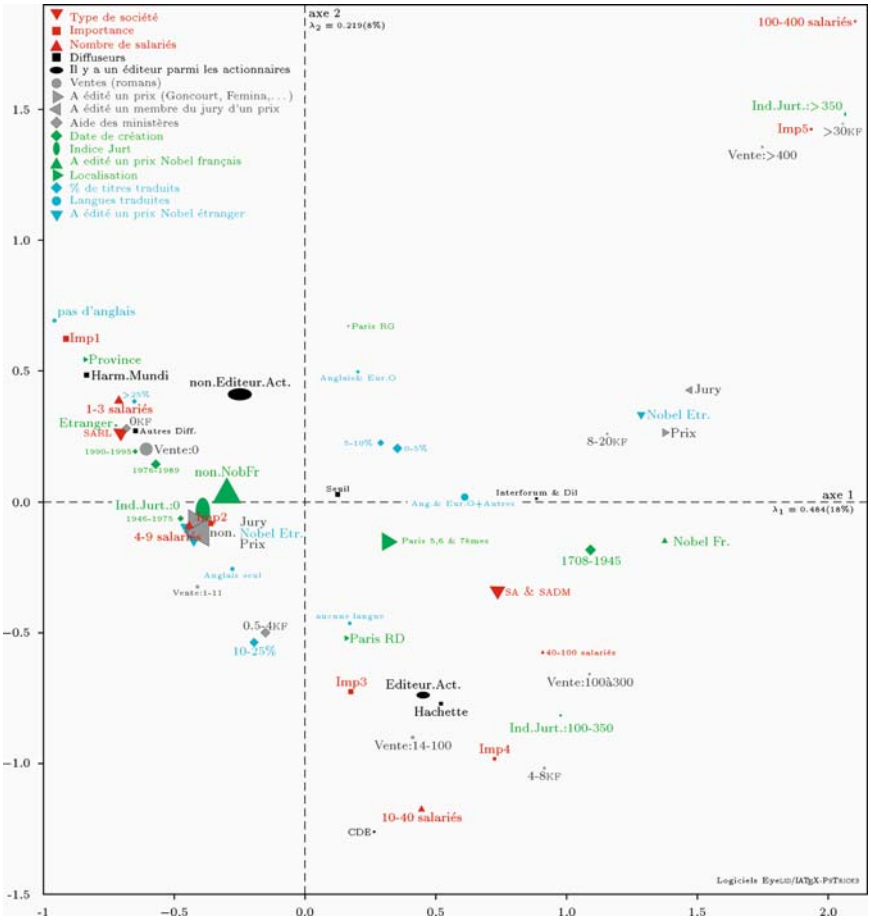


Fig. 2.3 Field of single-family housebuilders, *The Structures of the Economy*, p. 46

which a co-operation between both groups of researchers began). The analysis was based on prosopographical data collected about a small population of companies publishing literary books in French, including translations from foreign languages. The method used was specific MCA, invented by Brigitte Le Roux and Jean Chiche, which allows the analysts to determine certain modalities of active questions as "passive" modalities of active questions (for example, no-information or "junk" modalities) without destroying the symmetry properties of the method. With this technique, only active modalities of active questions create the distance in the constructed space.

As active questions, Bourdieu took indicators of capital (i.e. symbolic, economic, etc.). Principal component analysis was used in order to create an index of importance to reduce the redundancy of size variables. A Euclidean classification, based on the distance of the specific MCA, was utilized in order to characterize sub-groups of publishers, and to raise questions about the future dynamics of the market (for example the concentration processes). The sociological interpretation by Bourdieu insisted on the "chiasmatic" structure of the field of publishers, with a first opposition between big and small companies, and a second one between a commercial and a literary legitimate pole, which appears to be in homology with the classical composition axis found in previous analyses. Sociological interpretations assessed the relations existing between positions and position-takings (editorial choices) by qualitative comments based on the cloud of individuals (Fig. 2.4). [Au6]



[Au7] **Fig. 2.4**

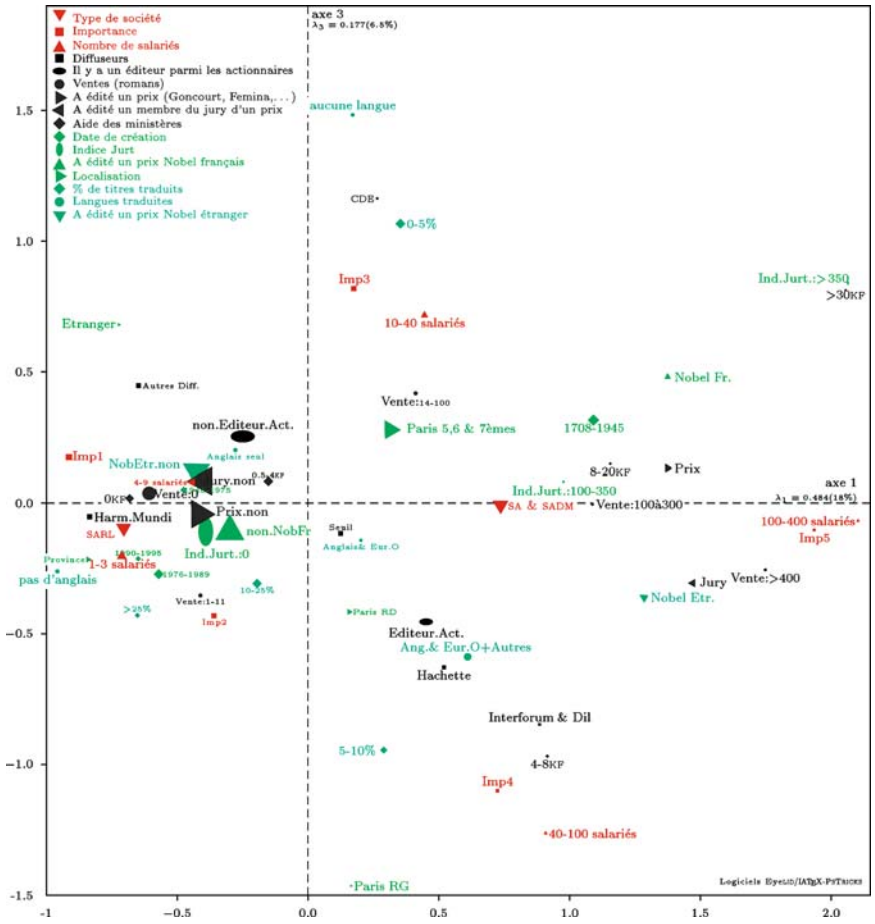


Fig. 2.4 (continued)

2.8 GDA in Bourdieu's "School"

To be complete, one should add that Bourdieu's colleagues and followers have made intensive use of GDA methods since the middle of the 1970s. Luc Boltanski (on "cadres" or "dénonciation"), Remi Lenoir (demographers, family policy), Patrick Champagne (French peasants), Monique de Saint-Martin (nobility), Annie Verger (artists), etc., have published chapters of books or articles based on MCA during the 1980s and the first half of the 1990s.

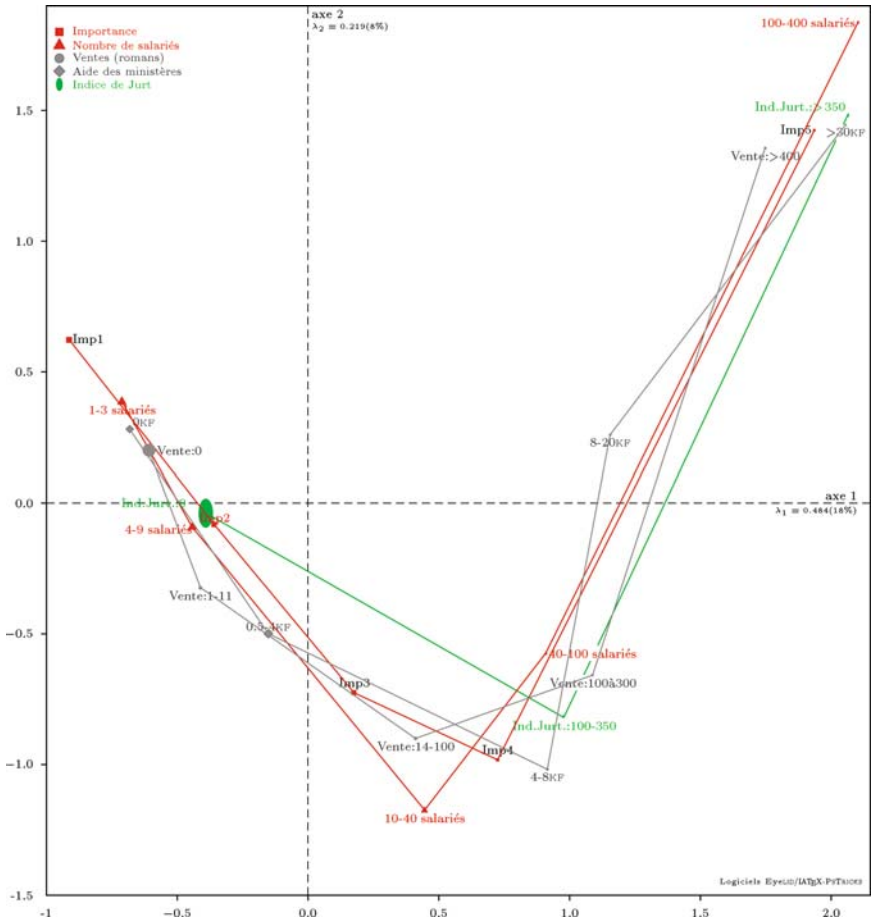


Fig. 2.4 (continued)

A new generation of research based on GDA was made visible through an article by Gisèle Sapiro about the field of French writers under German occupation published in *Actes de la recherche en sciences sociales* in 1996. In parallel, Swedish sociologists of education Donald Broady and Mikael Börjesson, inspired by Bourdieu's work, were intensively using CA and MCA in the 1990s. Lennart Rosenlund was simultaneously replicating Bourdieu's results about lifestyles in Stavanger in the 1990s as well. In 1998, a conference in Cologne, Germany gave way to a strong new alliance between Bourdieu, sociologists referring to Bourdieu's sociological theory and statisticians interested in Bourdieu's theory like Henry

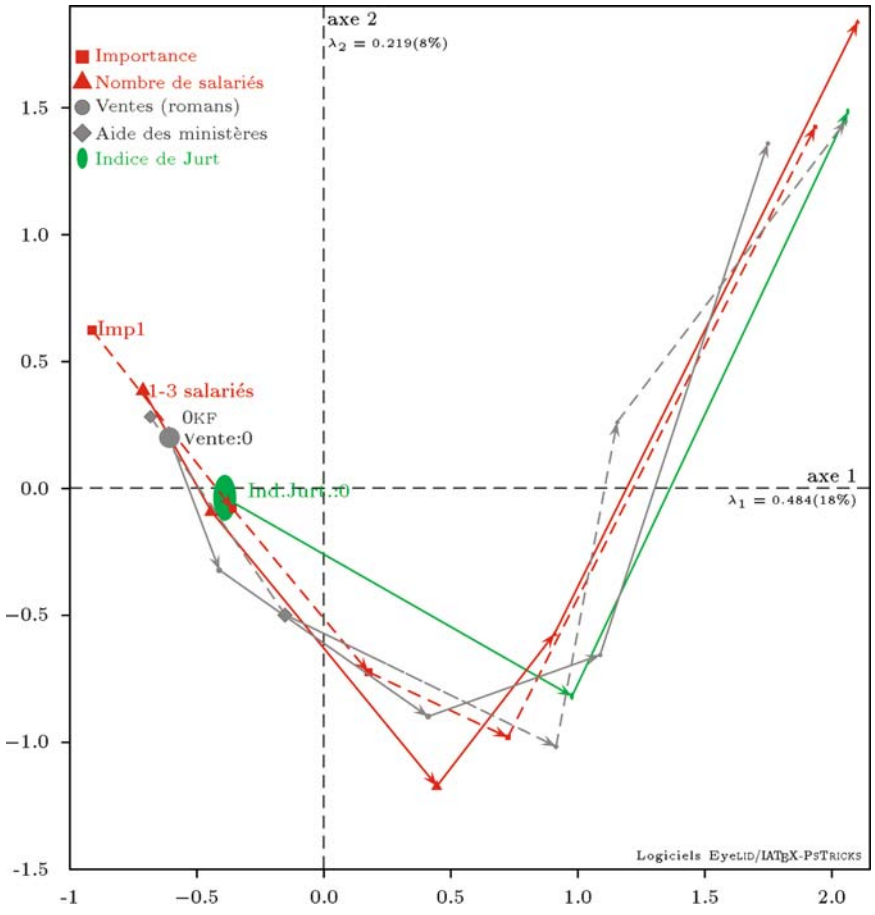


Fig. 2.4 (continued)

Rouanet and Brigitte Le Roux. Among the outcomes of this cooperation was the analyses published in *Actes de la recherche en sciences sociales* about the field of publishers mentioned and illustrated above (see Fig. 2.5), and an article by Hjellbrekke and others (2007) putting into practice recent theoretical and technical innovations in GDA (Figs. 2.6 and 2.7). [Au8]

One can add several articles by Lebaron (2001), Duval (2004), and recent theses by Denord (2003), Börjesson (2005) and Hovden (2008) among many other applications (which could be the object of another chapter about Bourdieu's school and quantification in recent years). Very recently, an article about lifestyles in the UK using specific MCA, concentration ellipses, etc., was published by a group of

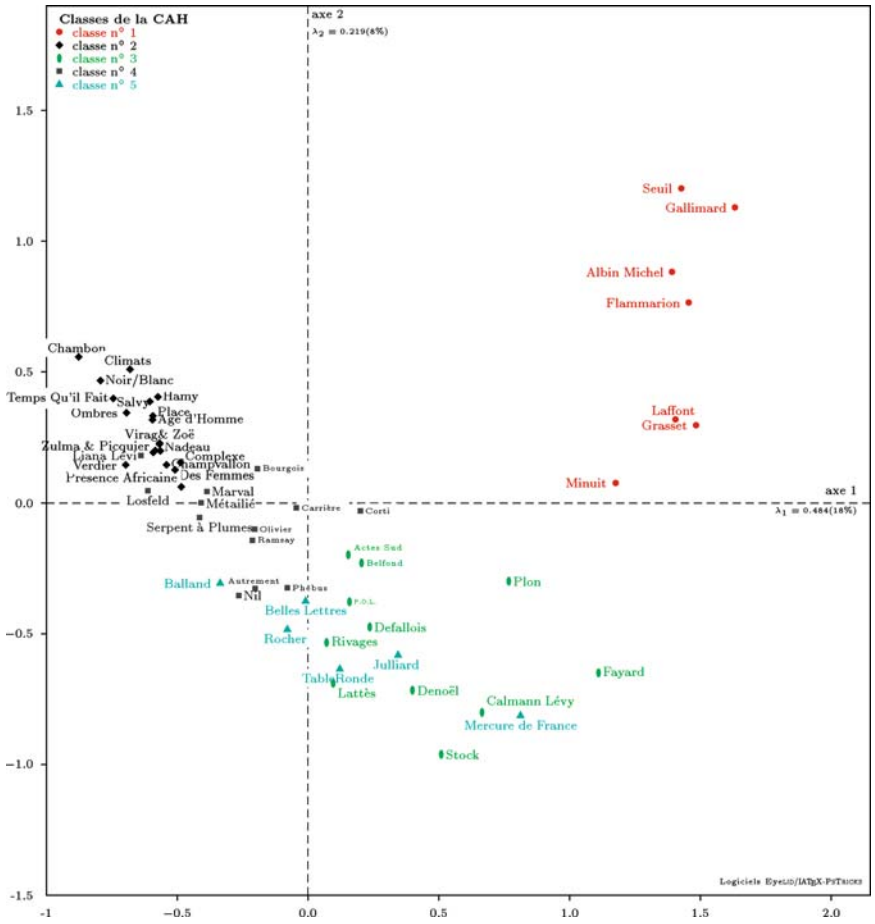


Fig. 2.5 [Au9]

sociologists including Mike Savage and Alan Warde, in cooperation with Brigitte Le Roux (Savage, Warde, Le Roux, & Rouanet, 2008).

2.9 Conclusion

Bourdieu was conscious of the shortcomings of the dominant quantitative methods in social sciences (especially regression methods), which he discovered with Alain Darbel as early as in the beginning 1960s. He consciously found an alternative to

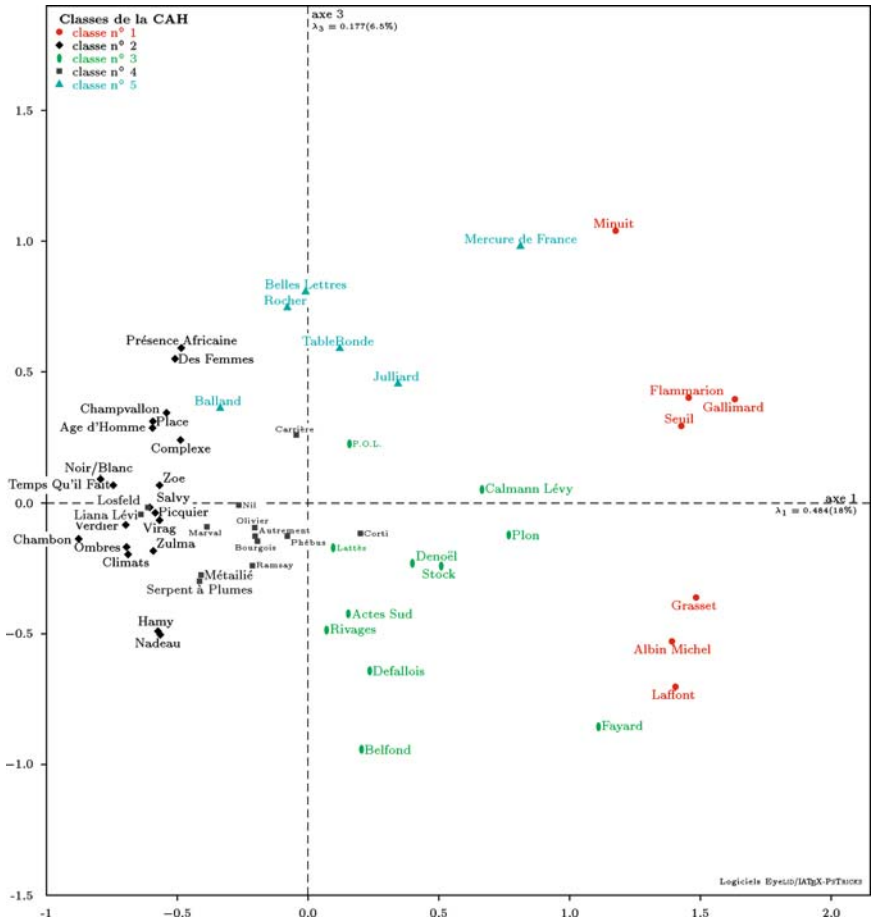


Fig. 2.5 (continued)

these methods with the geometric modelling of data, which he practised around 30 years, from the beginning of the 1970s (with the exploitation of the "taste survey") until the late 1990s (with prosopographical data on publishers).

In his various texts based on the use of GDA, one also finds various research strategies:

- Discovering and *showing* the structure of a field
- *Showing* structural homologies between fields
- *Explaining* (e.g. positions and position takings) through in-depth studies of the cloud of individuals and the cloud of modalities and
- Analysing the possible *dynamics* of a field – i.e., through classification

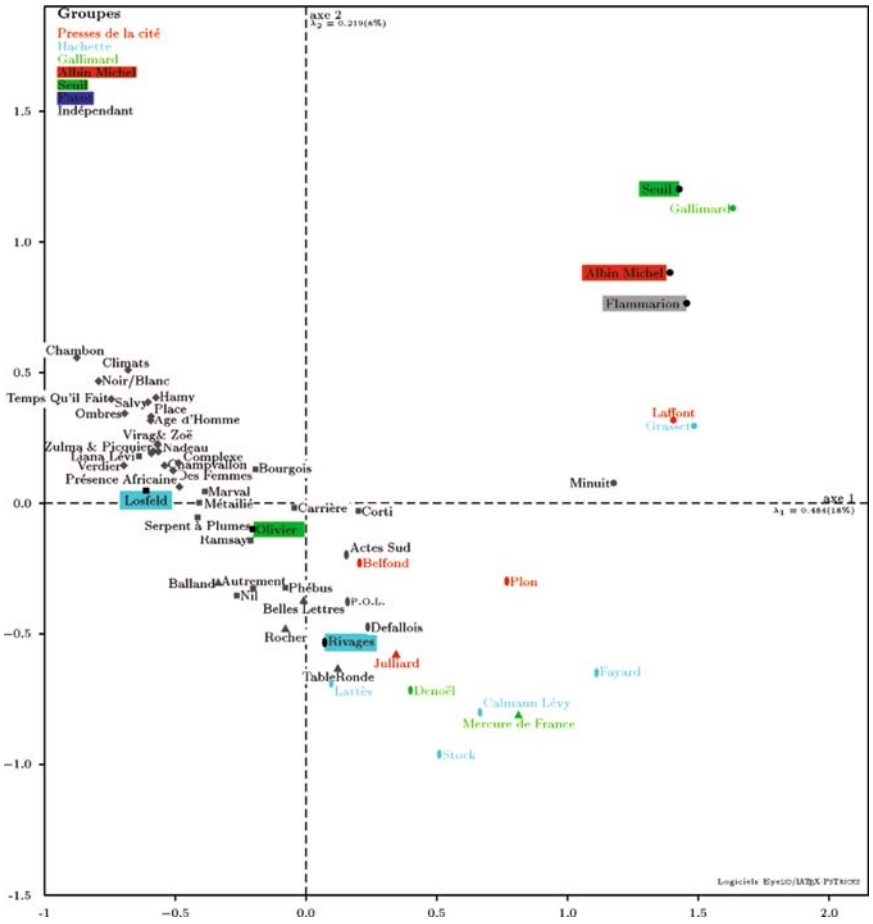


Fig. 2.5 (continued)

Bourdieu did not approve nor practice the usual rhetoric of scientific publications, presented in terms of hypotheses, empirical data and results confirming or failing to confirm hypotheses. Neither did he always clearly separate between sociological and statistical interpretations, nor did he completely formalize his theory of fields and his sociological interpretation of statistical analyses. Probably, the way his statistical practice was integrated into his sociological writing did not encourage dialogue with other quantitative traditions and the clear understanding of what he did from a statistical point of view. Many researchers may find this to regrettable. Inferential procedures, which could have completed and strengthened

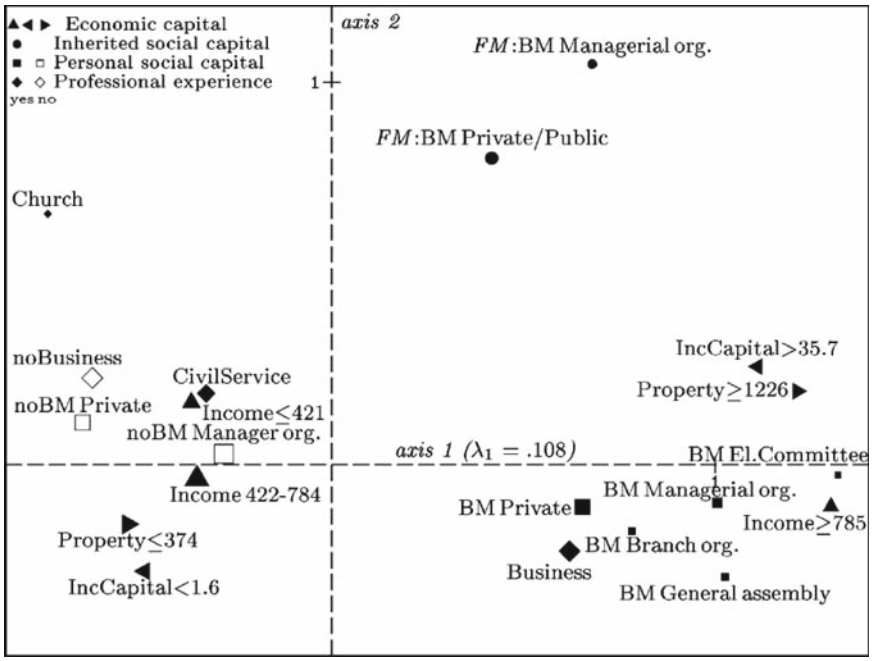


Fig. 2.6 Plane 1–2. Interpretation of axis 1: 20 categories with highest contributions to axis. FM = Father/Mother, BM = Board Member. The sizes of markers are proportional to the frequencies of categories

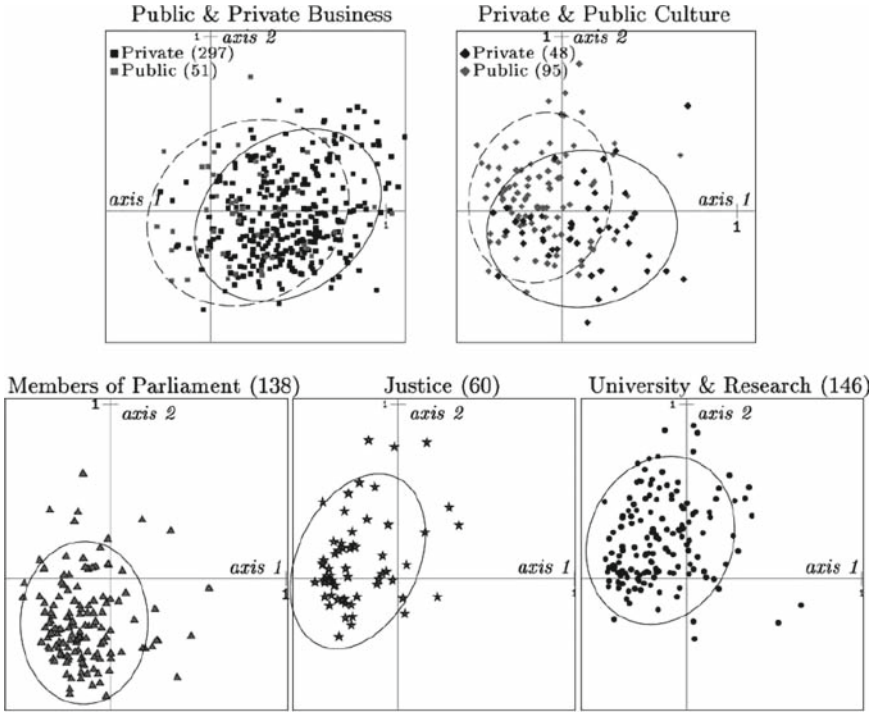


Fig. 2.7 Concentration ellipses around subgroups of interest in plane 1–2

his conclusions were not present. But Bourdieu was clearly always in search of a general geometric frame-model; he was enthusiastic about the possibility of future integration of regression into the framework of geometric data analysis. As such, it is clear that Bourdieu's adoption of the geometric modelling of data has opened a very large space for a strong empirical sociological research program.

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