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Fields and networks: correspondence analysis and social network analysis in the framework of field theory[☆]

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Abstract

Pierre Bourdieu advocated relational thinking and a relational methodology. Nevertheless, he rejected social network analysis as a suitable technique for analyzing fields and he prescribed correspondence analysis. There are no fundamental technical differences between the two methods: social network analysis can produce spatial diagrams that are very similar to correspondence maps. Bourdieu's problem with network analysis concerns the kind of relations that should be analyzed: objective relations instead of the interpersonal relations usually studied in social network analysis. This paper discusses the differences between the two types of relations and it argues that interpersonal relations mediate and transform the effect of objective relations. Network analysis is needed for investigating this process, which may help to further integrate Bourdieu's field theory and theory of practice.

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1. Introduction

Relational thinking is an important concept in Pierre Bourdieu's sociological theory. According to Bourdieu, social structure is a system of relations and differences instead of a set of attributes or 'essences.' Subjects, whether they are persons or institutes, derive their social meaning from their positions with respect to one another in a social field and not from their intrinsic characteristics.

[☆] A discussion in the seminar 'Réseaux et régulation', organized by Emmanuel Lazega and Lise Mounier (CLERSÉ-IFRESI and LASMAS-IRESCO, 4 November, 2002), has laid the foundation of this paper. Comments by this special issue's guest editors and by an anonymous reviewer have helped to improve it.

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1 In his empirical research, Bourdieu uses correspondence analysis for analyzing
2 and visualizing social fields. He explicitly states that this technique satisfies the
3 requirements of relational thinking (Bourdieu and Wacquant, 1992: 96–97). He
4 rejects another class of relational methods, viz., social network analysis. Never-
5 theless, several researchers have used social network analysis in their efforts to apply
6 and test Bourdieu's field theory (for applications to the arts and literature, see
7 Anheier et al., 1995; Gerhards and Anheier, 1989; Giuffre, 1999, 2001; Kenyon,
8 1992; De Nooy, 1991, 1999). This raises the question whether social network analysis
9 is compatible with Bourdieu's theory. Can social network analysis be used for
10 applying, testing, and developing field theory?

11 In this paper, I attempt to answer this question. First, I compare correspondence
12 analysis with social network analysis. Because methods formalize theoretical argu-
13 ments, they provide a formal way for comparing theories. Second, I present Bour-
14 dieu's objections against social network analysis, and, finally, I discuss ways in
15 which social network analysis can be used in the study of social fields. Followers of
16 Bourdieu should not reject network analysis as a tool for investigating social fields, I
17 argue, but network analysts should not reduce structure to interaction.

20 2. Two techniques

21
22 What is so special about correspondence analysis that Bourdieu prefers it to all
23 other analytic techniques? In this section, I compare correspondence analysis and
24 social network analysis from a technical point of view. I limit my discussion to the
25 technical details that are needed for drawing a comparison and for understanding
26 the link between field theory and correspondence analysis. For a full technical
27 account I refer the reader to the available handbooks (e.g., Weller and Romney,
28 1990; Greenacre, 1993; Greenacre and Blasius, 1994; on correspondence analysis;
29 Scott, 1991; Wasserman and Faust, 1994; Degenne and Forsé, 1999; on social net-
30 work analysis).

31 32 2.1. Correspondence analysis

33
34 Correspondence analysis is a technique for investigating the associations among a
35 set of qualitative or categorical variables. Measures of association such as Cramer's
36 V reflect the strength of the association among qualitative variables, but they do not
37 disclose its content: which combinations of categories occur and which do not. In
38 order to determine the content of the association, one has to inspect the cells in a
39 cross-tabulation of the variables. Table 1, for instance, shows the cross-tabulation of
40 Parisian professors by their universities and by the type of preparatory class they
41 attended. This fictitious example mimics Bourdieu's analysis of the academic field in
42 *Homo Academicus* (Bourdieu, 1984; I will refer to the English translation: Bourdieu,
43 1988).

44 Cramer's V indicates that there is a moderate association between the type of
45 preparatory education and the affiliation to a particular university. The cells of

Table 1

Professors by university and preparatory education (fictitious data)

Prep. class	University										Total
	Collège de France	Sorbonne		Faculty of Nanterre		EPHE 6th section and ENS		EPHE 4th and 5th sections			
lycée Louis-le-Grand	1	<i>1.0</i>	2	<i>1.6</i>	0	<i>0.9</i>	0	<i>0.6</i>	2	<i>0.9</i>	5
lycée Henry IV	0	<i>0.8</i>	3	<i>1.3</i>	1	<i>0.7</i>	0	<i>0.5</i>	0	<i>0.7</i>	4
major provincial lycée	0	<i>1.0</i>	1	<i>1.6</i>	3	<i>0.9</i>	1	<i>0.6</i>	0	<i>0.9</i>	5
other Paris lycée	5	<i>1.9</i>	2	<i>2.9</i>	0	<i>1.6</i>	0	<i>1.1</i>	2	<i>1.6</i>	9
other provincial lycée	1	<i>0.8</i>	3	<i>1.3</i>	0	<i>.7</i>	0	<i>0.5</i>	0	<i>0.7</i>	4
No prep. class	0	<i>1.4</i>	0	<i>2.3</i>	2	<i>1.2</i>	3	<i>0.8</i>	2	<i>1.2</i>	7
Total	7		11		6		4		6		34
Cramer's V	0.527										

Table 1 display the observed number of professors with a particular affiliation and preparatory education, as well as the expected number (in italics) under the assumption that the two variables are statistically independent. Cells with striking differences between the observed and expected frequencies represent combinations that occur relatively often or relatively seldom. We see, for instance, that the professors of the Sorbonne University received their education relatively often at the lycée Henry IV or at one of the 'minor' provincial lycées, but relatively few of them attended preparatory classes at other lycées in Paris, and none did not attend a preparatory class at all.

In a relatively small table such as Table 1, it is quite easy to determine the content of the association. In larger tables containing many variables, it is much more difficult to do this. In essence, correspondence analysis helps to understand the content of the associations among variables by visualizing them. Categories that co-occur relatively often are drawn closely together in a map, whereas categories that exclude one another, that is, which co-occur relatively seldom, are drawn far apart. Fig. 1 shows the results of a correspondence analysis¹ of the data summarized in Table 1. It is easy to see that the Sorbonne draws its professors relatively often from the lycée Henry IV in contrast to, for instance, the EPHE 4th and 5th sections. A correspondence map clusters categories that co-occur relatively often. In addition, the dimensions of the map can also be interpreted as latent variables, which order the space represented. In this example, the horizontal axis seems to represent the traditional standing of faculties or their symbolic capital, with the prestigious Collège de France and the Sorbonne at the right and the Faculty of Nanterre and the EPHE 6th section at the left.

¹ The procedure Correspondence Analysis was used from the SPSS software package. Fig. 1 shows the first two dimensions of the symmetric map of rows and columns.

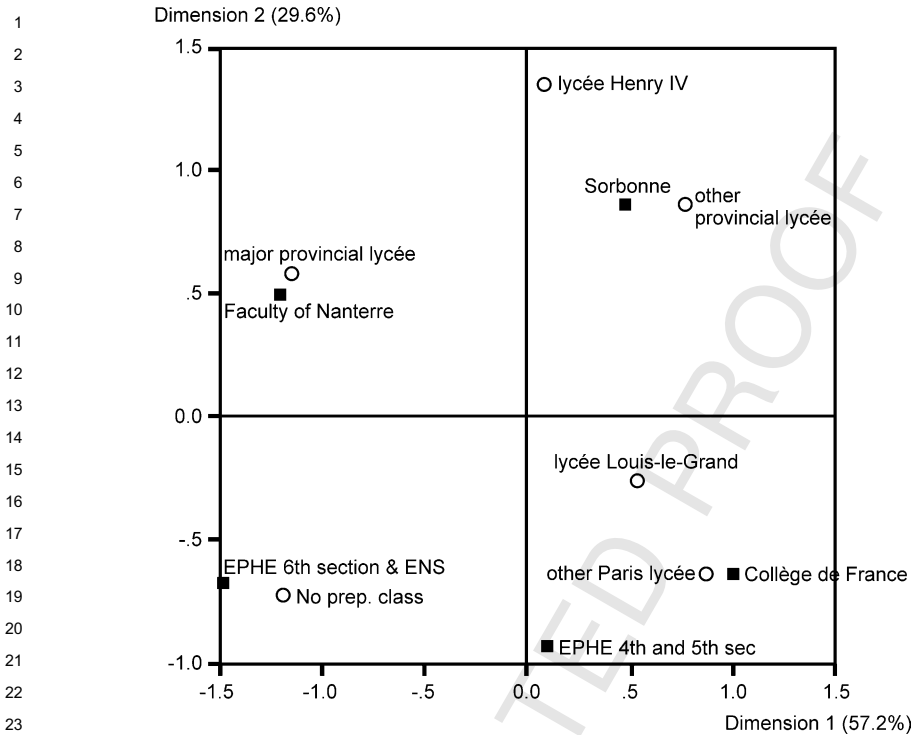


Fig. 1. Correspondence analysis of universities and types of education.

Unless the number of variables and categories is very low, two or three dimensions are insufficient for a perfect display of the associations. Then, correspondence analysis simplifies the associations between categories of different variables by computing the- usually two or three- dimensions that optimally represent them. This is done by a mathematical technique (singular value decomposition) that is also used in principal component analysis, hence correspondence analysis is sometimes called *factor analysis of correspondences*. As in principal component analysis, percentages, which are usually printed near the axes, tell how well the chosen dimensions reflect the data. In my example the horizontal axis covers 57.2% of the ‘true distances’ among the categories in Fig. 1. This percentage, which is also called the *quality* of the solution, is high because there are few categories in the example. With more variables and categories the quality drops quickly, for instance, to 5.17% for the first axis in the correspondence analysis of the affiliations and characteristics of professors at the Parisian arts and social sciences faculties in *Homo Academicus* (Bourdieu, 1988: 80).

In contrast to principal component analysis and other multidimensional scaling techniques, correspondence analysis uses qualitative data instead of quantitative data. As a result, correspondence analysis has some interesting properties which are

1 important to Bourdieu's field theory. A closer look at one of Bourdieu's applications
 2 of correspondence analysis may clarify the ways in which theory and method are
 3 intertwined.

4 In *Homo Academicus*, Bourdieu uses an advanced type of correspondence analysis
 5 which maps the categories of the variables as well as the respondents. In his book,
 6 Graph 2 (ibid. 80) maps the universities, professional affiliations, and background
 7 variables of Parisian professors, whereas Graph 7 (ibid. 276) displays the positions
 8 of the professors in a two-dimensional space. This type of multiple correspondence
 9 analysis is normally obtained by applying regular correspondence analysis to a spe-
 10 cial data matrix, which is called the indicator matrix or super indicator matrix
 11 (Greenacre and Blasius, 1994: 151). As we will see later, this data matrix is identical
 12 to a particular type of matrix used in network analysis, so it offers a bridge between
 13 the two techniques.

14 Table 2 displays part of the indicator matrix associated with the data set sum-
 15 marized in Table 1. Each respondent—a (fictitious!) Parisian professor in our
 16 example—is represented by a row. Apart from the professor's name, which is merely
 17 a label, the columns represent the categories of the original variables. The original
 18 variable 'university', for example, is replaced by a set of new variables, each repre-
 19 senting a particular university or category of universities. Either a professor has a
 20 position at a particular university, which is indicated by a one, or he has not, as
 21 indicated by a zero. Note that the former categories have become variables on their
 22 own, which illustrates the fact that correspondence analysis operates on concrete
 23 properties rather than on more or less abstract variables.

24 This is in line with Bourdieu's theoretical emphasis on the importance of dis-
 25 tinctive properties. His theory and methodology are relational in the sense that the
 26 relations between properties are important. The fact that one property usually
 27 entails another and excludes a third is deemed socially meaningful. The professors of
 28 the Collège de France, for instance, attended preparatory classes at lycées in Paris
 29 but as a rule not in the provinces. People are supposed to think in terms of dis-
 30 tinctive properties or intuitively recognize them.

31 The indicator matrix can be transformed and analyzed in order to obtain a map of
 32 the correspondences between the categories or columns. To this end, the indicator
 33 matrix is translated to a square symmetric matrix in which the categories represent
 34 the rows and the columns. The cells contain indices of association measuring the
 35 extent to which two categories are found simultaneously or exclude one another. In
 36 the French tradition of correspondence analysis, chi square or chi square based
 37 indicators are used.² In the example (Table 3), I divided the observed minus expec-
 38 ted frequencies by the expected frequencies for the co-occurrence of two categories
 39 for illustrative purposes. Note that this transformation is the basic component of all
 40 chi square indices. The observed and expected frequencies are identical to those
 41 presented in Table 1. If a combination of categories occurs more frequently than
 42 expected by chance, the subtraction of the expected frequency from the observed
 43

44
 45 ² In the American tradition, a geometric transformation is favored (Weller and Romney, 1990: 60).

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Table 2
Part of a (fictitious) indicator matrix

Professor	Collège de France	Sorbonne	EPHE 4 and 5	...	Louis-le-Grand	major provincial	other Paris	other provincial	No prep. class	...
Dumézil, G.	1	0	0	...	0	0	1	0	0	...
Lemerie, P.	1	0	0	...	0	0	1	0	0	...
Robert, L.	1	0	0	...	0	0	1	0	0	...
Lévi-Strauss, C.	1	0	0	...	1	0	0	0	0	...
Beaujouan, G.	0	0	1	...	0	0	0	0	1	...
Dolfuss, O.	0	1	0	...	0	1	0	0	0	...
Flaceliere, R.	0	1	0	...	0	0	1	0	0	...
Frappier, J.	0	1	0	...	0	0	0	1	0	...
Picard, R.	0	1	0	...	0	0	0	1	0	...
Renucci, P.	0	1	0	...	0	0	0	1	0	...
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Table 3
Square matrix of associations among categories

	C. de France	Sorbonne	Nanterre	EPHE 6	EPHE 4 and 5	Le-Grand	Henry IV	Major prov.	Other Paris	Other prov.	No prep.
C. de France	1.00	-	-	-	-	0.00	-1.00	-1.00	1.63	0.25	-1.00
Sorbonne	-	1.00	-	-	-	0.25	1.31	0.38	0.31	1.31	-1.00
Nanterre	-	-	1.00	-	-	-1.00	0.43	2.33	-1.00	-1.00	0.67
EPHE 6	-	-	-	1.00	-	-1.00	-1.00	0.67	-1.00	-1.00	2.75
EPHE 4 and 5	-	-	-	-	1.00	1.22	-1.00	-1.00	0.25	-1.00	0.67
Le-Grand	0.00	0.25	-1.00	-1.00	1.22	1.00	-	-	-	-	-
Henry IV	-1.00	1.31	0.43	-1.00	-1.00	-	1.00	-	-	-	-
Major prov.	-1.00	0.38	2.33	0.67	-1.00	-	-	1.00	-	-	-
Other Paris	1.63	0.31	-1.00	-1.00	0.25	-	-	-	1.00	-	-
Other prov.	0.25	1.31	-1.00	-1.00	-1.00	-	-	-	-	1.00	-
No prep.	-1.00	-1.00	0.67	2.75	0.67	-	-	-	-	-	1.00

^aNo association possible because categories within a variable exclude one another.

1 frequency yields a positive number, whereas infrequent combinations yield negative
2 outcomes.

3 The division by the expected frequencies ensures that relative differences instead of
4 absolute differences between observed and expected counts are taken into account.
5 The absolute differences are not very meaningful; if a category occurs frequently, a
6 small difference between observed and expected frequencies does not indicate a
7 strong association, but the same difference is important in the case of an infrequent
8 category.³ It is an important characteristic of correspondence analysis that scarce or
9 exclusive properties may exert a profound influence on the relations between cate-
10 gories, which very nicely suits Bourdieu's ideas on the distinctive effect of rare
11 properties.

12 The square matrix is subjected to singular value decomposition and it is rescaled.
13 The loadings of the categories on the dimensions can be used as co-ordinates in a
14 plot such as Fig. 1. In this plot, positive associations between categories (or frequent
15 combinations) are represented by smaller distances whereas negative associations (or
16 infrequent combinations) are represented by larger distances. In the interpretation
17 of the dimensions, eccentric categories must be taken into account because cate-
18 gories situated farther away from the origin of a dimension characterize that
19 dimension more than categories near the origin (e.g., lycée Louis-le-Grand).
20 According to Bourdieu, the dimensions represent the *objective social structure*, i.e.,
21 the distribution of the relevant types of capital or power. The exact location of
22 particular properties, organizations, and persons may vary from time to time, from
23 field to field, or from society to society, but the underlying dimensions, Bourdieu
24 argues, are always the same. The results of his analyses repeatedly show that the
25 dimensions represent the differential possession of social, cultural, or economic
26 capital.

27 In a similar fashion, the rows or respondents, in this example the professors, can
28 be positioned in a two or three-dimensional space. Professors who share relatively
29 many properties or affiliations are drawn closely together but far from the professors
30 with whom they do not share any properties. The map of respondents can be
31 superimposed on the map of properties because the underlying dimensions are the
32 same or rather because the positions of the properties are defined on the respondents
33 and vice versa. This is called a symmetric *joint map* (Greenacre and Blasius, 1994:
34 17–21). It is visually attractive, but it cannot be interpreted as easily as one would
35 intuitively expect. In the symmetric map, the distance between a respondent and a
36 property does not reflect the underlying association as accurately as the distance
37 between two respondents or between two properties. The joint map is literally a
38

39
40 ³ In the example, the difference between observed and expected frequencies is equal (0.4) in the com-
41 binations of, on the one hand, professors from the Sorbonne with a preparatory class at lycée Louis-le-
42 Grand (2 observed, 1.6 expected) and, on the other hand, EPHE 6th section professors with a preparatory
43 class at a major provincial lycée (1 observed, 0.6 expected, see Table 1). Because there are more Sorbonne
44 professors than professors of the EPHE 6th section in the example, the absolute difference is more telling
45 in the case of the latter. The numbers in the square matrix (Table 3) reflect this: 0.25 for the Sorbonne –
Louis-le-Grand combination versus 0.67 for the EPHE 6th section — major provincial lycée.

1 superposition of two spaces. We should interpret each space separately but
2 differences in one space, e.g., the space of properties, correspond to differences in the
3 other space, e.g., the space of respondents. Therefore, respondents and properties
4 that are positioned near each other probably ‘correspond,’ although we cannot tell
5 exactly how well.

6 In my opinion, this technical feature of joint correspondence maps is closely rela-
7 ted to the notion of homology in Bourdieu’s theory. Homology, which he describes
8 as “resemblance in difference” (Bourdieu, 1988: 178), may be regarded as the pro-
9 jection of one space onto another, which is deemed possible because they reflect the
10 same basic (i.e., objective) relations, namely, the distribution of different kinds of
11 capital or power. I should note that Bourdieu uses homology in his comparisons
12 between different fields, whereas my example of correspondence analysis super-
13 imposes two types of objects, viz., respondents and properties, within one field- the
14 academic field. A symmetric joint map from a simple correspondence analysis of
15 Table 1, however, would join a space of universities and a space of educational
16 backgrounds, thus combining the academic field and the social field in a way that is
17 compatible with Bourdieu’s theoretical use of homology.

18 19 2.2. Social network analysis

20
21 Now that I have sketched correspondence analysis, I turn to social network ana-
22 lysis. What is social network analysis and is it similar to correspondence analysis?
23 Defined broadly, social network analysis is the analysis of a set of relations among
24 objects. In a graphical representation of a network, which is called a sociogram,
25 objects (vertices) are represented by points, circles, boxes etc., and relations are
26 drawn as lines connecting pairs of vertices. In social networks the vertices usually
27 represent persons, organizations, or countries, and the lines identify interaction,
28 exchange, opinions, perceptions, etc.

29 Affiliations between people and organizations, like the links between professors
30 and universities or secondary schools in my example, are a common research topic
31 in social network analysis. In fact, the indicator matrix (Table 2) is one of the ways
32 to store the data of an affiliation network. It can be interpreted as a network as
33 follows: Each row (respondent) and each column (organization) identify a vertex in
34 the network. Cell values indicate the absence (zero) or presence (nonzero) of a line
35 between the row and column vertices and, optionally, the type or value of this line.
36 In Table 2, for example, the first row identifies professor Dumézil, who is a professor
37 at the Sorbonne (there is a one in the first column) and who attended a preparatory
38 class in Paris. In Fig. 2, which is a sociogram of the network, there are lines between
39 Dumézil on the one hand and the Sorbonne and the other Parisian schools on the
40 other hand. This simple example shows how properties, which are subjected to cor-
41 respondence analysis (having a post at the Sorbonne), can be treated as relations (an
42 affiliation between a professor and the Sorbonne) in network analysis.

43 Fig. 2 shows remarkable similarities with the correspondence map of Fig. 1 with
44 respect to the positions of the organizations. This is not a coincidence because the
45 sociogram is based on the same data and an optimization technique was applied that

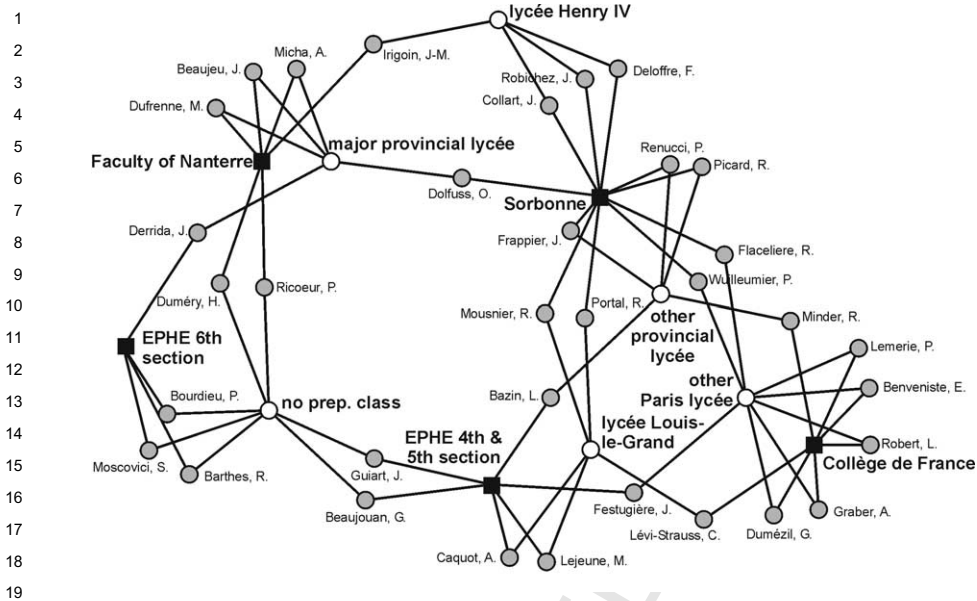


Fig. 2. Sociogram of affiliations to universities and preparatory classes.

is based on more or less the same principles as singular value decomposition in correspondence analysis: vertices which are connected by lines are drawn closely together whereas unconnected vertices are ‘pushed’ apart. The optimization technique is a so-called *spring embedder*, which treats the lines of the network as springs with a particular elasticity and strength. The procedure searches for a situation in which the system of springs is in a stable situation. Brandes (2001) shows that the technique used here- the spring embedder developed by Kamada and Kawai (1989)- is based on an algorithm which is very similar to the algorithm of multidimensional scaling.

In contrast to correspondence analysis, spring embedders do not indicate the fit of the layout and they do not compute dimensions, which are drawn horizontally or vertically. Fig. 2, for example, was reflected and rotated before its orientation matched the correspondence map of Fig. 1. Therefore, the researcher has less to go by in interpreting the resulting pattern. This is a disadvantage if one is interested in finding the underlying dimensions. In that case, it is better to apply singular value decomposition, or its kin eigen value decomposition, on the network. This requires, however, a transformation of the network like the transformation to a square matrix in correspondence analysis.

In network analysis the rectangular indicator matrix represents a special type of network, viz., a two-mode network. A two-mode network contains two classes of vertices such that all lines are found between vertices of different classes. In our example, the professors constitute one class and the organizations (universities and secondary schools) are collected in the other class. Professors or organizations are

1 not directly linked. The two-mode network can be transformed into two different
 2 one-mode networks: a network of organizations and a network of professors.
 3 In essence, the transformation is simple. If two organizations are linked to the same
 4 professor in the two-mode network, the one-mode network contains a direct line
 5 between the two organizations. If they share two or more professors, this line has a
 6 value (multiplicity) of two or more. The matrix of the one-mode network is
 7 square because the organizations (or professors) now identify the rows *and* the
 8 columns.

9 Table 4 shows the matrix of the one-mode network of organizations. One pro-
 10 fessor of the Collège de France attended a preparatory class at the lycée Louis-le-
 11 Grand. In Fig. 2, we can see that this is (the fictitious) Lévi-Strauss. The numbers
 12 along the diagonal of the matrix indicate the number of professors affiliated to each
 13 organization. In our example, seven professors held a position at the Collège de
 14 France (cf. Table 1). Although the matrix contains different numbers than the
 15 square matrix in correspondence analysis (Table 3), it is quite similar.⁴

16 This matrix can be normalized by a chi square or geometric transformation like
 17 the one used in correspondence analysis and, afterwards, it can be subjected to sin-
 18 gular value decomposition provided that the network is connected, that is, it does
 19 not contain isolated vertices or unconnected parts. Note that this provision also
 20 holds for correspondence analysis (Weller and Romney, 1990: 72). The component
 21 loadings can be used as coordinates in a map and the map of organizations can be
 22 combined with the map of professors in exactly the same way as in correspondence
 23 analysis.

24 We may conclude that there are no fundamental technical differences between
 25 correspondence analysis and social network analysis. This is reflected by the fact
 26 that some software packages for social network analysis include correspondence
 27 analysis, e.g., Ucinet, or eigen value decomposition, e.g., Ucinet, Pajek, and Multi-
 28 Net.⁵ In addition, layout optimization techniques, which are peculiar to network
 29 analysis, are based on more or less the same algorithms as multidimensional scaling
 30 techniques. As a consequence, the type of weighting implied by Bourdieu's notion of
 31 relative differences and the superposition of maps, which is connected to his notion
 32 of homology, are also possible in social network analysis.

33 Nevertheless, Bourdieu explicitly rejected social network analysis as a suitable
 34 methodology. At that time the visualization capabilities of software for network
 35 analysis were not as advanced as they are now, so it was not yet a very effective
 36 exploratory tool. His main objection, however, was theoretical rather than technical.
 37 Network analysts focus on interaction and exchange, whereas Bourdieu is princi-
 38 pally interested in background characteristics that signal the possession of different
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42 ⁴ In fact, it is identical to the Burt matrix in correspondence analysis (Greenacre and Blasius, 1994:
 43 148).

44 ⁵ For Ucinet, consult <http://www.analytictech.com>. Pajek is freely available at <http://vlado.fmf.uni-lj.si/pub/networks/pajek/default.htm> and MultiNet at <http://www.sfu.ca/~richards>.
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Table 4
One-mode network of organizations

	C. de France	Sorbonne	Nanterre	EPHE 6	EPHE 4 and 5	Le-Grand	Henry IV	Major prov.	Other Paris	Other prov.	No prep.
C. de France	7	– ^a	–	–	–	1	0	0	5	1	0
Sorbonne	–	11	–	–	–	2	3	1	2	3	0
Nanterre	–	–	6	–	–	0	1	3	0	0	2
EPHE 6	–	–	–	4	–	0	0	1	0	0	3
EPHE 4 and 5	–	–	–	–	6	2	0	0	1	1	2
Le-Grand	1	2	0	0	2	5	–	–	–	–	–
Henry IV	0	3	1	0	0	–	4	–	–	–	–
Major prov.	0	1	3	1	0	–	–	5	–	–	–
Other Paris	5	2	0	0	1	–	–	–	8	–	–
Other prov.	1	3	0	0	1	–	–	–	–	5	–
No prep.	0	0	2	3	2	–	–	–	–	–	7

*No line possible because one university and one school were selected for each professor.

1 kinds of capital, e.g., social status of the parents and the type of education received.
2 Bourdieu and network analysts have different kinds of relations in mind when they
3 think of social structure, as we will see in the next section.
4
5

6 3. Structure versus interaction

7
8 Bourdieu's rejection of social network analysis stems from his objections against
9 symbolic interactionism and against Max Weber as its precursor, notably in his
10 sociology of religion (Bourdieu, 1971, 1987; 26). In sharp contrast to Weber, Bour-
11 dieu distinguishes between structure and interaction (Bourdieu and Wacquant 1992:
12 113–114). Structure refers to the network of 'objective' relations that are the final
13 object of his sociology because they fundamentally structure society. In contrast,
14 interaction refers to activities by subjects, which establish 'intersubjective relations'
15 (Bourdieu's term). Symbolic interactionists and social network analysts usually
16 investigate the latter kind of relations; they equate structure to a network of inter-
17 subjective relations. The different meanings of 'structure' and 'relation' have caused
18 several misinterpretations. For instance, network analysts have mistaken Bourdieu's
19 objective relations for intersubjective relations such as friendship, which can be
20 measured 'objectively'. In order to avoid confusion, I will use the word *network* to
21 refer to intersubjective relations and I will reserve the word *structure* for objective
22 relations in this paper.

23 In my opinion, Bourdieu points out two fallacies in the study of interaction and
24 intersubjective networks: mistaking consequences for causes and disregarding time
25 and history. I will present the two objections now. In a subsequent section, I will
26 address the question whether social network analysis can overcome these objections
27 and contribute to the development of field theory.

28 According to Bourdieu, power relations structure society or, to be more precise,
29 they structure each field within society and the relations between fields. Power rela-
30 tions are linked to the possession of capital: people or institutions with more capital,
31 especially more capital of the right type (economic, social, cultural, or symbolic
32 capital), have more power. Note that the relative amount of capital is important
33 rather than the absolute amount, which is characteristic of Bourdieu's relational
34 thinking. Differential possession of capital is called an objective relation because it
35 exists outside the subject's intentions and cognition; it is a force operating on the
36 subject, which the subject has to cope with consciously or unconsciously. Objective
37 functions are latent, that is, they are not directly visible, but they can be extracted by
38 means of correspondence analysis.

39 In contrast, the intersubjective relations studied by symbolic interactionists or
40 social network analysts are manifest relations. According to Bourdieu they result
41 from the underlying power relations or objective relations; they are the con-
42 sequences rather than the sources and causes of social structure, so they should not
43 be the ultimate objects of investigation. The power relations exist even if there is no
44 interaction and this fact escapes the attention of symbolic interactionists or social
45 network analysts. Moreover, certain social phenomena can only be understood as

1 the result of structural similarities between fields (homologies), which do not require
2 interaction or exchange between the fields.

3 Charismatic leadership, for instance, should not be seen as a special kind of
4 interaction between a gifted leader and his or her followers. Bourdieu argues that
5 charismatic leadership results from a homology between different fields, for instance,
6 the social field and a professional field. In contrast to Weber, Bourdieu stresses the
7 similarity of the positions held by the prophet in the religious field and his followers
8 in the social field: both are dominated. The prophet leaves the religious hierarchy
9 because it offers no room for his ambitions. His statements, which contest the
10 existing order, strike a sympathetic chord among the part of the laity that cannot
11 realize its ambitions in the social field. No direct relation between prophet and
12 devotees is required because what matters is that the latter find a “justification
13 of their existence as occupants of a particular position in the social structure” (Bour-
14 dieu, 1987: 124) in the discourse and position of the prophet.

15 It is important to note, however, that Bourdieu’s theory has changed in this
16 respect. At first, Bourdieu (1971) postulated transactions between a professional
17 field and the social field, but he explicitly replaced transactions by the notion of
18 homology later on: “I now (in 1985) believe that only the logic of the structural
19 homology between positions occupied within the field of ‘professionals’ and posi-
20 tions occupied in the social field is capable of accounting for intersections of supply
21 and demand that owe nothing- or at least very little- to calculations, whether of a
22 more or less cynical nature, or to transaction understood as a conscious adjustment
23 to demand.” (Bourdieu, 1987: 135 n. 5). Clearly, Bourdieu turns away from an
24 anthropological approach focusing on social relations and exchange between indi-
25 viduals (e.g., Bourdieu, 1972, 1977) towards a sociology based on objective relations.
26 It is tempting to assume that his adoption of correspondence analysis is relevant to
27 this theoretical change.

28 Bourdieu’s second objection to symbolic interactionism concerns its exclusive
29 focus on the present, which entails a denial of the past. Symbolic interactionists
30 grant the person a lot of freedom in assigning symbolic value to the actions and
31 interactions that s/he perceives. According to Bourdieu, however, this freedom is
32 very limited because the symbolic value of behavior is strongly guided by categories
33 of perception that originated in the past and that have been transmitted from gen-
34 eration to generation through processes of socialization. Symbolic values, therefore,
35 are largely fixed and linked to social positions and contrasts. History determines the
36 power relations within a field and the categories that agents use for classifying
37 themselves and each another.

38 When a professor of philosophy qualifies his student’s essay or presentation as
39 ‘vulgar’ or ‘servile’, he uses words that have been used by the bourgeois to (de)clas-
40 sify the petty bourgeois for a long time. It is not a coincidence that these epithets are
41 applied mainly to students of lower social origins (Bourdieu, 1988: 195 ff). The
42 classification has become part of the professor’s *habitus*, that is, it has become a
43 category of perception. Applying the classification in his practice as a teacher, the
44 professor plays a part in its social reproduction. In their focus on the present, sym-
45 bolic interactionists overlook the social origins and reproduction of symbols and

1 meanings. Network analysts limiting their attention to interaction miss the same
2 point according to Bourdieu.

5 **4. Network analysis in the framework of field theory**

7 Bourdieu criticized social network analysis because it confused structure with
8 interaction. This does not mean that social network analysis cannot be used in
9 research grounded on his field theory. It can, provided that the analyst understands
10 the role of interaction and intersubjective relations in Bourdieu's theory. In this
11 section, I will summarize the ways in which researchers have used intersubjective
12 relations and network analysis for testing Bourdieu's field theory (Section 4.1), and I
13 will propose new applications based on network analytic techniques that have been
14 developed recently (Section 4.2).

16 *4.1. Reconstruction of a field*

18 Bourdieu used properties of people or organizations as data for his relational
19 analyses because of their availability and not out of a theoretical necessity (Bourdieu
20 and Wacquant, 1992: 230). It is quite plausible that people who are involved in a
21 field recognize power relations from attributes *and* from intersubjective relations:
22 acts of submission are just as telling as emblems of power. Thus a researcher may
23 use data on intersubjective relations for assessing the amount and distribution of
24 particular species of capital. If Bourdieu argues that interaction is driven by the
25 distribution of types of capital, the former can be used to measure the latter.

26 This is exactly what most network analysts working from a Bourdieuan perspec-
27 tive have been doing. Although economic and cultural capital is most easily mea-
28 sured by means of attributes, such as monetary property, type of education, or
29 social background of the parents, social capital has frequently been gauged from the
30 relations that people or organizations are involved in. Bourdieu gives every reason
31 for this approach when he defines social capital as “the sum of the resources, actual
32 or virtual, that accrue to an individual or a group by virtue of possessing a durable
33 network of more or less institutionalized relationships of mutual acquaintance and
34 recognition” (Bourdieu and Wacquant, 1992: 119). Here, Bourdieu really seems to
35 have in mind the kind of intersubjective relations studied in social network analysis.
36 Although the relations may stem from a distant past, it is quite likely that they must
37 have significance or ‘survive’ in the present, which is the favorite time of network
38 analysts, in order to function as resources.

39 In social network analysis, two approaches towards social capital can be dis-
40 tinguished. One approach, represented by Lin (2001) and Boxman et al. (1991),
41 stresses the quality of the resources accessible through intersubjective relations,
42 whereas the other approach, represented by Burt (1992), focuses exclusively on
43 the pattern of relations. Although the former approach is inspired by rational
44 action theory, which is not exactly Bourdieu's cup of tea, it is probably closer
45 to his ideas than the purely structural approach because the former takes into

1 consideration indicators of economic or cultural capital owned by a person's
2 contacts.

3 Relational indicators of social capital are used as variables in statistical analyses,
4 e.g., as independent variables explaining the position or success of a person or
5 organization in a field. If recoded into a limited number of categories, they can also
6 be used in a correspondence analysis, as Albrecht (2002) has shown, which is an
7 elegant way to remedy the absence of social capital in Bourdieu's own correspon-
8 dence analyses.

9 The fourth type of capital, symbolic capital, is also a good candidate for a net-
10 work analytic approach. If symbolic capital refers to prestige, for instance, "the
11 capital of scientific prestige" in the academic field (Bourdieu, 1988: 40 ff. and 234–
12 237), its measurement can be based on a classic assumption in social network ana-
13 lysis, viz., that asymmetric relations express (or even constitute) social prestige. A
14 prestigious person or organization will receive relatively many positive choices but
15 return few. In the academic field, citations offer a well-known example, but we may
16 also use the flow of professors through universities as a measure of prestige because
17 they generally move up (comp. De Nooy, 2002a). An important advantage of these
18 relational approaches to prestige is that they do not require a more or less arbitrary
19 categorization of organizations or events according to prestige by the researcher.

20 Social network analysis offers a range of prestige indices, which either calculate
21 the prestige of single persons and organizations on a continuous scale (Wasserman
22 and Faust, 1994: Ch. 5) or assign all persons or organizations to a limited set of
23 discrete levels (De Nooy et al., in press: Ch. 9). The stratification into discrete levels
24 is usually established by means of blockmodeling, a technique clustering people or
25 organizations in such a way that the relations within and between the clusters (the
26 'blocks') exhibit particular patterns (Wasserman and Faust, 1994: Ch. 9, 10, and 12).
27 The clusters are thought to represent different social positions.

28 The analysis of the literary field by Gerhards et al. (Gerhards and Anheier, 1989)
29 offers a nice example of this approach. They investigated social relations such as
30 friendship among the writers living in Cologne, Germany. According to their results,
31 the writers can be partitioned into four clusters (elite, junior elite, periphery, and
32 light literature writers), which exhibit the pattern of a standard center-periphery
33 blockmodel: the elite and junior elite constitute a tightly connected center sur-
34 rounded by a periphery of writers draped around the center in the sense that per-
35 ipheral writers are connected to central writers rather than to their colleagues in the
36 periphery. According to Gerhards et al., this center-periphery pattern reflects the
37 unequal distribution of symbolic capital (or prestige), which Bourdieu also found in
38 his analysis of the French literary field (Bourdieu, 1983). The writers of 'light lit-
39 erature' constitute a separate cluster which is not connected to the center or the
40 periphery. This structural gap represents the difference between legitimate and ille-
41 gitimate forms of literature (high versus low culture).

42 As a second step, Gerhards et al. include the clustering of writers according to
43 their blockmodel as a categorical variable in correspondence analysis. This analysis
44 corroborates the interpretation of the blockmodel in terms of symbolic prestige or
45 literary capital. We should note that Gerhards et al. interpret the results of the final

1 correspondence analysis as the macro-structure of the literary field; the blockmodel
2 of intersubjective relations merely serves to measure the distribution of cultural
3 capital. This is important because we should not mistake the blockmodel for the
4 structure of objective relations investigated by Bourdieu.

5 6 4.2. *Fields and the logic of practice* 7

8 Field theory stresses the importance of the past and it focuses on objective rela-
9 tions within the wider social field. Does this mean that current intersubjective rela-
10 tions within a particular field, e.g., the literary field, have no impact or theoretical
11 relevance other than that they indicate the distribution of symbolic capital? I do not
12 think so. Intersubjective relations are instrumental to the creation and distribution
13 of symbolic capital as pointed out by Bourdieu in his theory of practice. Combining
14 field theory and practice theory, I argue, we must acknowledge that a field's struc-
15 ture does not merely reflect objective relations. Interaction or intersubjective rela-
16 tions, which have a dynamic of their own, at least mediate and transform the forces
17 of objective relations. Social network analysis is needed to clarify their role.

18 In his theory of practice, Bourdieu elaborated on the nature of symbolic capital
19 (Bourdieu, 1990,1998). Symbolic capital emerges in the interplay between properties
20 of groups, such as physical strength or wealth, and categories of perception that
21 induce people to recognize, hence produce the symbolic value of these properties.
22 People acquire the categories of perception during their socialization; these cate-
23 gories become part of their habitus and they accept them as natural, unquestionable
24 categories. Bourdieu stresses that the categories of perception ultimately refer to the
25 differential possession of types of capital—the objective relations in the wider social
26 field— because they serve to legitimize the existing power relations and social
27 inequalities.
28

29 Since it is a being-perceived, which exists in the relations between properties
30 held by agents and categories of perceptions (high/low, masculine/feminine,
31 large/small, etc.) which constitute and construct social categories (those above/
32 those below, men/women, large/small) based on union (alliance, companion-
33 ship, marriage) and separation (the taboo of contact, of misalliance, etc.),
34 symbolic capital is attached to groups— or to the names of groups, families,
35 clans, tribes— and is both the instrument and the stakes of collective strategies
36 seeking to conserve or increase it as well as individual strategies seeking to
37 acquire or conserve it, by joining groups which possess it (through the exchange
38 of gifts, companionship, marriage, etc.) and by distinguishing themselves from
39 groups which possess little or are destitute (stigmatized ethnic groups). (Bour-
40 dieu, 1998: 103–104).
41

42 The cited sentence summarizes the dual nature of symbolic capital: properties
43 and categories of perception. It also highlights the role of intersubjective rela-
44 tions, such as exchange and marriage, in the struggle for symbolic capital.
45 Because symbolic capital is connected to groups or to the names of groups,

1 alliances with groups through social ties are effective weapons in this battle.
2 Thus, Bourdieu incorporates and transforms the legacy of Marcel Mauss (gifts)
3 and Claude Lévi-Strauss (kinship, classifications) in his theory of practice.
4

5 The rules for this struggle or the strategies employed in this struggle, I think, con-
6 stitute what Bourdieu calls a logic of practice. The logic of honor (Bourdieu, 1972, 1998:
7 95) is an example of a logic of practice in a pre-capitalist society. This logic inter-
8 twines properties, e.g., the possession of capital, habitus (dispositions or categories
9 of perception), and interaction. The logic of honor refers to the tacit understanding
10 that exchanges within a group, e.g., gifts, must be reciprocated after some time. The
11 group is defined historically, that is, its members learn to associate themselves with
12 the name of a family, clan, or tribe in their first years. This is a typical category of
13 perception that remains unquestioned. In addition, they learn to connect the group
14 name to a set of people, who usually occupy similar social positions. Reciprocal
15 exchanges among this set of people preserve the capital of the group; framing the
16 exchanges as acts of honor mystifies the underlying group pressure restraining the
17 freedom of the group's members. Thus, group names legitimize social obligations
18 within and between groups, which preserve social equalities and inequalities.

19 The concept of symbolic capital offers a bridge between field theory and the the-
20 ory of practice. Field theory focuses on structure at the macro level, especially when
21 it relies on correspondence analysis. It produces a map of an entire field, such as the
22 French academic field, disclosing the general dimensions structuring the field. Prac-
23 tice theory, however, concentrates on the micro level of individual action and inter-
24 action very much in the fashion of (cultural) anthropology, examining the
25 descriptions or qualifications that people pass on one another for concepts that refer
26 to class distinctions. The Postscript to *Homo Academicus* (Bourdieu, 1988) offers an
27 interesting example.

28 In order to combine the two theories, one has to accept the idea that practice
29 within a field⁶ is at least partly responsible for the field's structure. If one would hold
30 on to a view in which the objective relations within the wider social field, that is, the
31 distribution of economic, social, and cultural capital, are the sole determinants of
32 field structure, practice within a field would be irrelevant. Practice only becomes
33 important if interaction, activities, and statements within the current field are able to
34 mediate objective power relations and modify categories of perception. In other
35 words, one has to acknowledge that the structure of a field does not depend exclu-
36 sively on external power relations and historically fixed categories of perception.

37 There are empirical results suggesting that interaction within a field affects and is
38 affected by categories of perception. In my research into the Dutch literary field, for
39 instance, I found that classifications according to literary style proposed by literary
40 authors and critics match collective patterns of evaluations published in reviews and
41 interviews (De Nooy, 1991, 1999). Some classifications according to style reflect
42 polarizing groups of writers and others precede polarization. This is completely in
43

44 ⁶ Sub-field may be a better term: "the sub-field which people belong to (often overlapping the space of
45 mutual acquaintance and social interaction)" (Bourdieu, 1988: 178).

1 line with Bourdieu: “operations of classification are *operations of co-optation*” (Bourdieu
2 1988: 195). Classifications are tools in strategies of inclusion and exclusion: whom to
3 relate to and whom to isolate. They symbolize and consolidate patterns of inclusion
4 and exclusion because they transform them into identities, which are taken for
5 granted later on. In this perspective, classifications reinforce patterns of relations,
6 which reinforce the classifications thereupon. This self-strengthening process is quite
7 similar to the process captured by the concept of an institutional logic in the school
8 of thought baptized *new institutionalism* (e.g., see Friedland and Alford, 1991).

9 In this example, some literary classifications have become enduring categories,
10 which have won a permanent place in histories of literature. Interviews that I con-
11 ducted with critics, librarians, teachers, and booksellers 10–15 years later (De Nooy,
12 1993) show that the categories are widely known and respected. There is every rea-
13 son to assume that some classifications originating from the interaction within the
14 literary field have become enduring categories of perception for people involved in
15 this field. This is not to say that these categories are unconnected to general social
16 categories and power relations in society at large. On the contrary, some literary
17 classifications, e.g., ‘Feminist literature’ quite specifically allude to general categories
18 and to a general social development such as the rise of a politically engaged female
19 readership. The important point is that the patterns of interaction, e.g., the activities
20 of and the actions towards female authors and critics, and their proclamations
21 within the literary field, were essential to the creation of the ‘literary’ classification.
22 In the process, positive or negative symbolic value was attributed to certain char-
23 acteristics of these authors and their work. In this particular period, the 1970s, a
24 writer’s sex became an issue and structuring principle, inculcating a social distinction
25 into the heads of authors, critics, and readers without calling a spade a spade.
26 However, it does not have to be important in another period or place.

27 Objective relations, that is, power relations in the broader social field, shape the
28 structure of a field insofar as they influence the interaction within the field. This is
29 the theoretical point that I want to make here. I do not believe in ‘pure’ homology,
30 that is, homologous positions in separate fields as the cause of attraction, agreement,
31 and similar behavior. The aforementioned prophet and his/her followers do not just
32 occupy homologous social positions; they gather and interact, and this they prefer
33 doing in places where they confront (hence interact with) the establishment. Their
34 interaction gives rise to classifications, stigmata, identity, to which other groups react.
35 In my opinion, objective relations are not autonomous forces that directly and con-
36 tinuously affect each field. They become operative when people or organizations take
37 part in the interaction within a field, bringing to bear properties and qualifications
38 characteristic of another field. This triggers a group process, creating winners and
39 losers among the members of the field (micro effect) and repositioning the field with
40 respect to the ‘challenging’ field (macro effect). In the process new symbolic distinc-
41 tions and values are being created or existing ones are being reaffirmed or discarded.

42 Therefore, it is important to analyze how, when, and to what extent objective
43 relations affect the interaction and structure of a field as well as the symbolic value
44 of categories and qualifications in a particular period. Correspondence analysis
45 cannot perform this task because it abstracts from the actual interaction among

1 people and organizations. Network analysis is indispensable here. There is a long
2 tradition of network analytic techniques focusing on individual strategies in creat-
3 ing, maintaining, or breaking intersubjective relations such as friendship, advice,
4 gifts, etc. These techniques do not analyze the overall pattern of a network, as in
5 blockmodeling. They concentrate on the immediate neighborhood of each vertex
6 (actor) in the network: his or her direct contacts. Reciprocity of relations is one of
7 the oldest structural properties analyzed in this tradition: to what extent do actors
8 reciprocate previous choices, gifts, evaluations, and the like? In my study of the
9 Dutch literary field, however, I found a tendency towards deference rather than
10 reciprocity (De Nooy, 2002b, c). The literary field seems to be regulated by a logic of
11 deference rather than a logic of honor based on reciprocity. Does this mean that the
12 literary field tacitly serves to legitimize a social hierarchy?

13 Recently, techniques⁷ have been introduced that analyze the conditions favoring
14 interaction, e.g., the attributes of the sender and receiver involved in a tie. With
15 these techniques, it is possible to test whether interaction occurs mainly between
16 actors who belong to the same social category or who possess a particular amount
17 or type of capital. In other words, these techniques offer the possibility to detect
18 individual strategies as combinations of individual properties, collective classifica-
19 tions, and interaction. With these models, we may, for instance, determine whether
20 and to what extent general social characteristics such as sex, age, amount and types
21 of capital, attract or block interaction with similar and dissimilar alters. In a similar
22 way, attributed properties of individuals, e.g., a particular literary qualification, can
23 be included in the analysis. In other words, objective relations and field specific
24 properties can be included in order to assess their relative importance.

25 If these factors systematically influence interaction among pairs of actors, patterns
26 of relations emerge at the level of the field or sub-field, e.g., polarization, which are
27 hypothesized to trigger substantive classifications and qualifications. Blockmodeling
28 techniques can unveil these patterns, which can be subsequently compared to the
29 classifications and qualifications in order to determine their association. To what
30 extent do the classifications articulate and reinforce emerging patterns of interac-
31 tion? The social roots of classifications, however, can also be detected with a special
32 type of network analysis (Galois lattices), which analyzes the duality of categories
33 and the objects that are being categorized (e.g., Mohr and Duquenne, 1997, or
34 Breiger, 2000, who proposes combining Galois lattices with correspondence analysis).

35 36 37 **5. Conclusion**

38
39 Bourdieu advocated relational thinking and relational methods. This does not
40 automatically mean that social network analysis is a proper technique for testing
41 Bourdieu's theories. The network analyst ought to realize that the objective relations
42

43 ⁷ E.g., p2 models (Lazega and Van Duijn, 1997) and p* models, which may be fitted with standard
44 logistic regression analysis (Crouch and Wasserman, 1998; Searly and Richards, 2000; Wasserman and
45 Pattison, 1996), and SIENA for longitudinal network data (Snijders, 2001).

1 that are central to Bourdieu's field theory are different from the kinds of relations
2 studied in network analysis. The objective relations studied by Bourdieu refer to the
3 differential possession of capital: economic, social, and cultural capital. In his theory,
4 the relational aspect is not some kind of exchange or interaction but the fact that
5 relative differences count: do you have more capital, another type of capital, or another
6 property or trait than someone else? This is the reason why Bourdieu prefers corre-
7 spondence analysis: correspondences are relative frequent combinations of properties.

8 Bourdieu's field theory is probably influenced by correspondence analysis. The
9 technical complexity of a symmetric joint map, in which two spaces are more or less
10 projected onto each other, translates to homologies between fields as an explanatory
11 principle. The same dimensions, viz., the distribution of the kinds of capital, define
12 the morphology of all fields. That is why people in one field are hypothesized to feel
13 a strong affinity to people occupying similar positions in other fields.

14 Due to the interrelationships between Bourdieu's field theory and correspondence
15 analysis, it seems impossible to replace correspondence analysis by social network
16 analysis. In my opinion, however, this is not true. First of all, network analysis can
17 produce the same type of spatial maps as correspondence analysis, using the same
18 data and similar techniques. Second, social network analysis can be used to gauge
19 the amount of social and symbolic capital. Interaction and person-to-person rela-
20 tions, which are studied in social network analysis, play an important role in these
21 two kinds of capital, so network analysis can be used to measure the distribution of
22 these forms of capital.

23 Most important, however, is network analysis as a link between field theory and
24 practice theory. Analysis of the literary field suggests that the interaction within the
25 field is consequential to its structure and to the classifications and qualifications used
26 within the field. Symbolic values and symbolic capital are created, reaffirmed, or
27 changed in the interaction within a field as described in Bourdieu's theory of prac-
28 tice. In this paper, it is argued that objective relations may influence interaction
29 within a field: people adjust their relations to their general social characteristics.
30 Subsequently, interaction changes the distribution of symbolic capital, that is, the
31 possession of valued properties as well as the valuation of properties itself. Hence,
32 interaction mediates and transforms the effect of objective relations on the structure of
33 a field. Objective relations do not operate on the basis of mere homology between fields.

34 Since interaction is a crucial nexus in this view, network analysis is needed for
35 unraveling the processes in which a field is being restructured and symbolic values
36 are (re)produced. Correspondence analysis, which abstracts from the concrete
37 interpersonal relations, cannot perform this task. Therefore, I expect that the appli-
38 cation of network analysis will contribute to the development and integration of
39 field theory and practice theory.

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