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The Chance of Influence

A Natural Experiment on the Role of Social Capital in Academic Hiring

Olivier Godechot

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Abstract

The effect of social capital is often overrated because contacts and centrality can be a consequence of success rather than its cause. Randomized or natural experiments are an excellent way to assess the real causal effect of social capital, but these are rare. This paper relies on data from one such experiment: recruitment at the EHESS, a leading social science institution in France, between 1960 and 2005. The EHESS recruitment process uses an electoral commission to produce a first-stage ranking of applicants, which is then provided to the faculty assembly for final voting. The commission is partly composed of faculty members drawn at random, a feature that this article exploits in order to compare the chances for success of applicants whose contacts have been drawn to sit on the commission (treated) versus those whose contacts have not been drawn (control). It shows that a contact such as a PhD advisor has a causal impact, especially for assistant professor hiring exams: it doubles the chance of being ranked and increases the share of votes by 10 percent. This phenomenon may explain part of the classic "academic inbreeding" issue.

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Contents

1 Natural experiments on social capital 2

2 The role of mentorship in academic careers 5

3 Recruitment at EHESS: Electoral procedure, methods, and data 8
- A form of recruitment both specific and general 8
- The random dimension of the electoral commission 10
- The model 12
- Links studied 13
- Checking the experiment's validity 14

4 Results 15
- The advisor effect on the electoral commission 15
- The advisor effect at various stages 19
- Effects of other contacts 20

5 Concluding comments 21
- Possible underlying mechanisms 23
- A public policy issue 24
- On the respective efficiency of strong and weak ties 24

Appendix 26

References 31

The Chance of Influence: A Natural Experiment on the Role of Social Capital in Academic Hiring

> What has remained, however, and indeed has considerably increased, is a factor peculiar to the university career. Whether or not an adjunct lecturer, let alone an assistant, ever succeeds in achieving the position of a full professor, let alone of a head of an institute, is a matter of pure chance. Of course, chance is not the only factor, but it is an usually powerful factor. (Weber 2008: 28)

The importance of networks and contacts in getting a job (Granovetter 1973, 1974) is one of sociology's most famous propositions. Indeed, labor surveys have shown repeatedly that an important fraction of the population cites contacts as the reason they were hired (Granovetter 1995): in the United States in 1975, 27 percent of male respondents in the Current Population Survey reported that they had found their job through personal contacts (Granovetter 1995). In France, in 1994 (Forsé 2000), 26 percent of Labor Force Survey respondents who had been in a job for less than a year declared that they had found this job through contacts, either family contacts (6 percent) or personal ones (20 percent).

Nevertheless, empirical studies provide rather mixed evidence on the importance of contacts in general and weak ties in particular for finding a job more quickly or acquiring a better-paid or more highly respected position. Some studies have found that weak ties matter (Yakubovich 2005; Fernandez/Weinberg 1997; Lin/Ensel/Vaughn 1981), an effect that is either a consequence of *information* gleaned from weak ties about job opportunities (Yakubovich 2005; Fernandez/Weinberg 1997) or a consequence of indirect influence on people in charge of recruitment decisions (Lin/Ensel/Vaughn 1981). Other studies, on the other hand, have underlined the importance of strong ties, for instance in a poorly competitive labor market such as China (Obukhova 2012; Bian 1997). People in charge of recruitment may therefore have great *motivation* to use their discretionary power in favor of the closest candidates. But studies based on large samples are much less confident about the causal impact of contacts on job opportunities. The first-order correlation between job contacts and professional outcome disappears once the authors introduce a set of elementary controls and test the relation beyond the subsample of white upper-class males (Bridges/Villemez 1986) or the trivial correlation between the characteristics of individuals and the characteristics of their contacts is taken into account (Mouw 2003).

Mouw's survey on the causal effects of social capital (2006) generalizes his 2003 negative results about the absence of a link between contacts and job outcomes. Most statistical estimations consider network measures as exogenous and neglect two classic sources of bias, unobserved heterogeneity and reverse causality. These biases are more likely to occur with network variables and can lead to substantial overestimation of the impact of networks. Mouw forcefully advocates for methods, such as natural experiments and randomized experiment techniques, that can best circumvent such statistical problems.

Randomized experiments are expensive and difficult to implement for most real-life situations such as recruitment. We don't find many beyond the issues that are the most linked to public policies and to development economics (Banerjee/Duflo 2011). Natural experiments are unfortunately rare. This article presents data from such an experiment, on the recruitment of scholars at the École des Hautes Études en Sciences Sociales (EHESS), a leading French institution of higher education in the social sciences, enabling us to estimate the precise causal effect of social capital. The EHESS hiring procedure requires that a significant proportion of the electoral commission – the committee initially ranking the applicants – is drawn at random from the faculty of this institution. Thanks to this random component, we can apply the classical experimental feature comparing the outcomes of two groups: a) the treated group, i.e., the applicants whose contact has been randomly drawn; and b) the control group, i.e., the applicants whose contact, although eligible, has not been randomly drawn. The difference in outcome between these two groups informs us about the effect of having a social contact on the committee. This article shows that when one of the randomly drawn committee members is the PhD advisor for a given candidate, it doubles the odds of that candidate being put forward for recruitment by the electoral commission.

The rest of the paper is organized as follows: the first section details the shortcomings of classical estimations of the causal impact of social capital. The second section establishes links between the EHESS study and previous studies on the academic labor market. The third section presents the data and the method. Results are presented in the fourth section, followed by a discussion on the limitations and scope of the results.

1 Natural experiments on social capital

In network sociology, it has been very common since the work of Granovetter (1974) and Burt (1992) to use a basic regression analysis to try to explain an outcome (getting a job or a promotion, level of pay or pay increase) through the use of social capital variables. Those social capital variables can be either the "who" type of social capital (who you know, a specific contact) or the "where" type of social capital (where you are in the network in terms of centrality, structural constraint, etc.).

Mouw (2006) concentrates his criticism on the "who" type of social capital. Building on the work of the econometrician Manski (1993) on peer effects, he shows that regressions seeking to evaluate the influence of a specific contact are particularly vulnerable to the "reflection problem." Since homophily is considered to be a universal feature of social relationships (McPherson/Smith-Lovin/Cook 2001), one can expect a strong correlation between an individual's characteristics and those of their contact, both on observable dimensions (which can be controlled for in regressions) and unobservable dimensions (which cannot be controlled for). This unobserved heterogeneity may lead researchers to overestimate the impact of having a contact.

Let us consider an example. In Combes, Linnemer and Visser (2008), the authors test how applicant rankings in economics in the Agrégation du supérieur, a national competitive exam for university professors, are affected by links applicants may have to members of the hiring committee, for example the presence of a former PhD advisor, a coauthor, or a member of the same department on the committee. They find a strong correlation between such links and the probability of an applicant being hired. Since members of the committee are chosen by the French government, however, they presumably are talented in their field, and the homophilic patterns of relationships would suggest that their contacts (especially former PhD candidates) are similarly talented. The authors do control for talent variables, for instance the number and quality of publications by both applicants and their respective advisors, or the possession of a position or PhD from one of the top six universities for economics in France. Nevertheless, the teaching talent that also strongly contributes to the exam result remains unobserved in the study. If members of the jury are talented teachers and are assortatively matched with contacts equally talented on that dimension, the coefficient of the tie variable could serve more to measure this unobserved talent than to measure the causal effect of having a tie in the jury. The importance of social capital could therefore be overestimated.

It's true that Mouw does not discuss much of the "where" type of social capital, a term that is used in this paper to describe social capital that is approximated by a network aggregate measure such as centrality (Freeman 1979) or structural constraint (Burt 1992). As the characteristics of the contacts and their specific roles are not known, it is difficult to say a priori whether the "reflection problem" plays an equivalent role here. But one must pay attention to the fact that measures such as centrality and structural constraint, traditionally cited as causes of success, are also a consequence of past success: people want to connect to the most successful people as a way of sharing their status (Gould 2002; Barabási/Albert 2002). Moreover, those already in a network of successful people may hear about promising people by word of mouth before they achieve public success (Menger 2002), so promising or successful people are more likely to have a larger personal network and to appear more central. This is why indegree centrality is viewed more as a measure of prestige (Freeman 1979) than as a capacity to manage social capital in order to obtain new resources (although this can happen afterwards).

Regressing success on network centrality or on structural constraint can lead to suspicions of reverse causality because network aggregate measures can be viewed as either an indicator of past success or an anticipation of future success.

Mouw suggests several ways to overcome the difficulty of using traditional econometric methods to properly identify the causal impact of social capital. These include fixed effects (Mouw 2003; Yakubovich 2005), which can control for the time constant individual heterogeneity, and exogenous instrumental variables, provided that such variables are really exogenous. He also strongly advocates for natural experiments (or randomized experiments, if possible) in which a random dispatch allows one to compare, as in the classic double-blind experiment of pharmacology, the difference in outcome for two randomly drawn groups: those receiving the treatment and those receiving a placebo.

For instance, several papers have used college roommate matches as a natural experiment to estimate social capital effects (Zimmerman 2003; Marmarosa/Sacerdote 2002; Sacerdote 2001). The randomness of the matches allowed researchers to compare the fate of students whose roommates were among the top 25 percent of their class (treatment) to the control group, whose roommates were more ordinary and fell into the two middle quartiles (Sacerdote 2001). The former group had an undergraduate grade point average 0.047 higher (0.026 standard deviation) than the latter. If roommate assignments were really made at random, this means that the effect was independent of any other observed or unobserved variable and that the estimation avoided the classic unobserved heterogeneity bias.

Based on the rare cases where such methods are possible, usually involving roommate assignments on American college campuses (Marmarosa/Sacerdote 2002; Sacerdote 2001), Mouw (2006: 99) finds that the effect relationship is generally low or zero and concludes his article with the following pessimistic statement:

> If individuals choose friends who are similar to them, then one may reasonably suspect that the effects of many social capital variables are overestimated because of unobserved, individual-level factors that are correlated with friendship choice and the outcome variable of interest. This is not an argument that social capital does not matter, but merely a suspicion that many existing empirical estimates of the effect of social capital are not much of an improvement over our intuition or anecdotal conviction that it does matter. Overall, the evidence reviewed here suggests that when the problem of endogenous friendship choice is taken into account by a method that attempts to deal with it explicitly, the resulting estimates of social capital effects are modest in size, ranging from essentially zero for the majority of the estimates using randomly assigned roommates to the small, but significant, coefficients reported in fixed effects models of peer effects in education or juvenile delinquency.

This conclusion could seem rather severe for the numerous studies that use network variables as exogenous variables. Is the strong net correlation they find due to some endogeneity? Before we accept this conclusion that is so damaging to network sociology,

we should recall that the college roommate tie may not be the most appropriate for studying the impact of a network. First, this type of tie is rather heterogeneous, ranging from very close to distant and even conflicting. Second, a roommate has little connection at best to the professional and work environment, the domain of interest in most of the research on the impact of social capital.

2 The role of mentorship in academic careers

The role of contacts and networks is not as welcome in academic labor markets as in other labor markets. Robert Merton (1973) has shown that the scholarly community developed faith in a set of norms that govern or at least should ideally govern the academic world: communalism, disinterestedness, originality, organized skepticism, and universalism. The last of these assumes that scientific claims will not "depend on the personal or social attributes of their protagonists" (ibd.: 270) and "finds further expression in the demand that careers be open to talents" (ibd.: 273). Although some studies stress that contacts do have a globally positive role in the development of ideas (Collins 1998; Wuchty/Jones/Uzzi 2007), most of them question the extent to which universalism and particularism govern real academic labor markets (Long/Fox 1995) while studying how personal relations correlate with individual outcomes such as grants, publications, wages, and jobs.[1]

One common finding of quantitative studies on academic careers is that productivity, generally measured by the number of publications, is at best a very partial predictor of academic careers (Hargens/Hagstrom 1967; Long/Allison/McGinnis 1979; Long/McGinnis 1981; Leahy 2007). The commencement and advancement of an academic career seems to correlate more with the productivity and prestige of the mentor and that of the doctoral department than with indicators of individual scientific productivity (Long/Allison/McGinnis 1979; Reskin 1979; Long/McGinnis 1981). Most studies insist on the overwhelming importance of a sponsor or a mentor, who is most generally the PhD advisor (Reskin 1979; Cameron/Blackburn 1981; Long/McGinnis 1985). Future productivity is therefore more a consequence of contextual effects than of initial talent (Long/McGinnis 1981).

Studies on academic careers in United States generally focus on long-term outcomes, such as career advancement or wages among a set of scholars who have generally succeeded in getting at least their first job in the academic system after the PhD. Analyzing the European state competitive exams taken upon entrance to an academic career can

1 See: Long/Allison/McGinnis 1979; Reskin 1979; Cameron/Blackburn 1981; Long/McGinnis 1985; Godechot/Mariot 2004; Leahy 2007; Kirchmeyer 2005; Combes/Linnemer/Visser 2008; Zinovyeva/Bagues 2012; Lutter/Schröder 2014.

help to enrich previous studies by focusing on two elements that are often overlooked: the possibility of comparing PhDs who succeed to those who fail, and the opportunity to delve more deeply into the social capital mechanisms (direct support or indirect prestige) by which a sponsor may help a PhD to get a job. In the French political sciences field, PhDs benefit from the social capital of their advisor and that of their PhD committee. The number of contacts and the importance of the structural holes of the members of a PhD committee within the network of PhD committees are a predictor of the probability that PhDs will enter an academic career, a result interpreted by the authors as an indicator of greater efficiency in the diffusion of a reputation within a community (Godechot/Mariot 2004). It is likely, however, that sponsorship becomes effective not only through indirect efforts at promoting the candidate, but also when the applicant has a sponsor on the hiring committee itself. In their study of the Agrégation du supérieur, Combes (2008) find that the presence of the PhD advisor on the hiring committee has a strong impact, equivalent to five additional articles, and the presence of colleagues from the applicant's own department has a moderate impact, but they find no significant impact if other faculties from the applicant's doctoral university are on the committee or the PhD advisor's coauthors are members. Zinovyeva and Bagues find very similar results in their study of the first step in academic recruitment of university professors *(catedrático de universidad)* and associate professors *(profesor titular de universidad)* for all disciplines in Spain from 2002 to 2006: the strongest effect, tripling the odds of recruitment, comes from the presence of the PhD advisor, followed by that of a coauthor, a colleague from the same university, or another member of the PhD committee (Zinovyeva/Bagues 2012: Table A1).

Although scholars acquainted with an applicant may sometimes adopt rules to limit the influence of personal bias, for example remaining silent (Lamont 2010), they still usually participate in the final vote. Even when they may want to remain silent, their opinions are usually solicited by their colleagues on the committee, since an applicant's contact is likely to have the most information on that applicant. Abstaining or resigning from the committee when one knows an applicant (a situation very common in academic "small worlds") can often paralyze a committee. In the CNRS recruitment exam in France, for example, only in a limited number of cases are the members of the hiring committee requested to resign, such as when an applicant is a current or former family member, the object of a strong love or hate relationship, a supervisor, or someone with whom the committee member has a notorious conflict. It is not unusual for a previous advisee to be among the applicants, and this is all the more common in institutions where inbred applicants are allowed to compete. The bias in favor of former advised PhD candidates, as has been documented in previous literature, might in fact explain the levels of academic inbreeding shown for many countries and their consequences for academic productivity.

Academic inbreeding was very common in the United States until the late 1970s, generating controversy about its possible negative impact (Eells/Cleveland 1935a, 1935b; Hargens/Farr 1973), and it remains common in law schools (Eisenberg/Wells 2000). Hargens (1969) found a rate of inbred scholars in the United States of 15 percent at the end of the fifties, a number that is comparable to the 1 percent that would have prevailed had recruitment been independent from the university of origin. While most departments in the United States have now set informal rules banning the recruitment of inbred scholars, at least at the beginning of the academic career, academic inbreeding remains substantial in many countries in Europe and in Mexico (Horta 2013; Horta/Veloso/Grediaga 2010; Zinovyeva/Bagues 2012).

Godechot and Louvet (2010) have shown that in France in the 1980s, inbred PhDs could have seventeen times more chance of getting hired than outbred PhDs. Moreover, most such studies have shown, usually through a university of origin fixed effect, that inbred scholars are less productive scientifically (Horta 2013; Horta/Veloso/Grediaga 2010; Eisenberg/Wells 2000; Eells/Cleveland 1935a). The classic model of sponsorship by an advisor could therefore have important consequences for patterns of recruitment in the academic labor market because it would contribute to the academic inbreeding phenomenon. Based on advisor mobility, Godechot and Louvet (2010b) seem to indicate that advisor presence on hiring committees could be responsible for one-fourth to one-third of the academic inbreeding phenomenon.

Most of these studies indicate that on academic labor markets, contacts count, and the advisor-advisee contact counts tremendously. Nevertheless, one must not forget Mouw's critique that the role of social capital can be overestimated because of statistical methods that do not handle reverse causality or unobserved heterogeneity properly. The fact that early career success is more related to the doctoral department or advisor's productivity or prestige than the applicant's, for instance, could also be explained by an improper measure of academic talent. An interesting concept like visibility (Leahy 2007) has been coined as a form of social capital, but it is difficult to identify properly and to distinguish from quality since it is measured through citation count. As we have seen with Combes, Linnemer and Visser (2008), most studies on the role of contacts rest on classical regressions and do not fully address the endogeneity issue. Godechot and Mariot (2004) deal with this problem by using the usual PhD committee set up by a PhD advisor, as an instrument for the PhD committee set up for the observed candidate. This strategy may account for some of the possible endogeneity measurement problems, but presumably not all. Zinovyeva and Bagues (2012) developed a very similar estimation at the same time the present paper was being written, based on a similar natural experiment in Spain: from 2002 to 2006, in all disciplines, the first step of the recruitment of university professors and associate professors was to be evaluated by a jury drawn at random from the members of a given discipline. Strikingly similar results were found for the French EHESS between 1961 and 2005. This similarity led us to believe that the phenomenon is general and extends beyond the institutional framework studied.

3 Recruitment at EHESS: Electoral procedure, methods, and data

What would become the EHESS was founded in 1948 as the sixth "section" of the École Pratique des Hautes Études (EPHE), a French doctoral school in social sciences. Its chief boosters were Charles Morazé, Lucien Febvre, and Fernand Braudel, historians of the "annals" school, which advocated strongly for interdisciplinary research (Mazon 1988). Initial faculty at the school came from four main disciplines: history, sociology, anthropology, and economics. The school continued to focus on these four disciplines in subsequent years, as well as expanding into other social science disciplines such as literature, linguistics, geography, psychology, philosophy, law, and area studies. In 1975, the sixth section became independent from the EPHE and Paris University and was renamed the École des Hautes Études en Sciences Sociales (EHESS)[2]. This institution rapidly became one of the most famous institutions in the French social sciences, hiring scholars such as Braudel, Legoff, and Furet in history; Bourdieu, Touraine, and Boltanski in sociology; Lévi-Strauss, Héritier, and Descola in anthropology; Barthes and Genette in literature; and Guesnerie, Bourguignon, and Piketty in economics. EHESS hired also scholars who were much less famous than these names and much less productive in terms of publication, some of whom actively supervised numerous PhDs.

A form of recruitment both specific and general

EHESS promoted new forms of teaching (the research seminar), new ways of organizing knowledge (notably around area studies), and new forms of research that valued interdisciplinary exchange. It also adopted a special recruitment procedure called "election" that continues to contribute strongly to its identity. The election procedure can seem specific, but it has features that are common to many other academic institutions.

First, the procedure is interdisciplinary: apart from a few exceptions, open positions are described by neither discipline nor topic. Applicants are elected by the full faculty assembly rather than being hired by a single-discipline jury. If they are to be successfully recruited, applicants must be convincing beyond their own discipline.

Second, there are neither formal job talks nor auditions, even though applicants must submit a research and teaching project. Yet it is common for applicants to visit – privately, if possible – with the EHESS president, the members of the EHESS governing bureau, and some key members of the faculty. If applicants are to be elected, they need faculty members who will campaign actively on their behalf to convince other electors of their merits. Most of this support activity is informal and difficult to collect, but traces

2 The name EHESS will be used throughout this paper for simplicity, although this designation is correct only after 1975.

of it have been recorded in the archives. The meeting minutes provide fairly systematic evidence of the names of persons writing support letters in favor of applicants, or those who support them publicly during faculty assemblies. Recruitment is therefore similar to the procedures conducted by French assemblies of intellectuals such as the *Académie française* and the *Académie des sciences,* but it also shares interdisciplinary aspects with the postdoc grant application studied by Lamont (2010). Scholars are expected to be knowledgeable and generalist enough to evaluate applicants beyond the boundaries of their own respective disciplines.

Third, because the evaluation of applicants is time-consuming and costly, since the early fifties the EHESS has set up an electoral commission to more thoroughly evaluate applicants. The commission consists of 20 to 32 members of the EHESS faculty and has been assisted by an EHESS reviewer since 1975 and an external reviewer since 1987. Until 1997, members of the EHESS that were not part of the electoral commission were allowed to step in during the meeting to say a few words in favor of one or another applicant. The EHESS president also has a say in which applicants are worth hiring and speaks on behalf of the school's governing bureau, all of whose members are statutory members of the electoral commission. At the end of the discussion, the electoral commission will rank the applicants, usually through a one-round vote. This indicative ranking is very influential and is announced at the opening of the faculty assemblies devoted to recruitment. Applicants obtaining an absolute majority from the first round are put forward,[3] followed by others in decreasing order of votes. Unless a faculty member specifically requests it, applicants who did not receive any votes in the electoral commission are not discussed. Applicants who received votes are presented to the assembly by the internal reviewer, and declared supporters speak in their favor. The discussion is followed by multiple rounds of voting, at the end of which the applicants elected are hired.

The electoral commission therefore plays a similar role to that of the hiring committees at many American universities, which conduct an initial evaluation of applicants before a vote by the full faculty. The commission result constitutes a sort of straw poll, establishing a list of applicants worthy of concentrated support and votes during the assembly. Applicants with majority support from the electoral commission have a very high chance of being elected by the assembly: 87 percent of those who achieved a majority at the first stage were ultimately elected, versus 5 percent of the rest. Still, the election assembly is not just a simple confirmation of the electoral commission's choice. One time out of every eight, it contradicts the electoral commission, most generally in the case of applicants who were put forward but did not achieve a strong majority. Only 68 percent

3 It must be noted that the combination of one-round votes and absolute majority criteria may sometimes lead the electoral commission to put forward fewer applicants than the number of open positions.

of the applicants with 50 to 60 percent of the votes during the electoral commission were ultimately elected, whereas those close to the majority at the first stage, with 40 to 50 percent of the votes, still had a fair chance of 42 percent of ultimately being elected.

The random dimension of the electoral commission

Let us now turn to an interesting feature of the electoral commission for testing the causal impact of social capital: its composition. Since 1961, the EHESS has drawn most of the members of its two electoral commissions (one for assistant professor exams, the other for professor exams) at random from the faculty assembly. It is therefore possible to compare applicants whose contacts have been drawn to sit on the commission to those whose contacts have not been drawn.

This quasi experimental setting has some complexities we must account for, however (Table 1). One-third of the commission consists of statutory members: the president of the EHESS, the four or five members of his or her bureau, and the EHESS members of the scientific council, who are elected for terms of four to five years. These nonrandom members of the commission may have some special unobserved characteristics (such as administrative, scientific, and/or political talent) that favored their election as president, bureau member, or scientific council delegate, leading to the fear that applicants in contact with those ex officio commission members could share their unobserved characteristics and that these could explain their recruitment. We must make sure, therefore, that such contacts do not bias our estimation of the social capital effect.

The second complexity is that substitutes are also drawn at random to replace titular drawn members that are not able to attend the electoral commission meeting. The chance any substitute has of sitting in the commission is lower than that of a titular (drawn) member and is not totally random, since it depends on the nonrandom decision of the titular member whether to sit out the electoral commission.

To add a third complexity, there is a significant difference between the theoretical size of the electoral commission and its effective size, because of unexpected absences that even the use of substitutes cannot remedy completely. On the one hand, contacts who want to promote applicants are probably more effective if they are present at the meeting, so social capital might be better measured if we analyze effective presence rather than composition. On the other, the decision whether to attend the meeting is not random, and this may bias the results. In order to avoid this last bias, then, we should analyze commission composition, which could be viewed as the *intention to treat* effect, rather than meeting presence, which could be viewed as the *treatment on treated* effect.

Table 1 Composition of electoral commissions

	Assistant professors		Professors	
	Composition	Presence	Composition	Presence
Total size (including substitutes)	33.83 (6.05)		28.48 (3.24)	
Effective size (excluding substitutes/ including present substitutes)	28.00 (4.30)	25.50 (5.38)	24.16 (3.06)	21.61 (4.26)
Bureau including president	5.43 (1.19)	4.97 (0.82)	5.13 (1.42)	4.61 (1.15)
Scientific council	6.57 (4.75)	5.56 (4.54)	3.56 (2.98)	3.02 (2.81)
Randomly drawn members including substitutes	22.67 (4.64)		20.09 (3.44)	
Substitutes (randomly drawn/present)	5.83 (3.21)	1.56 (1.58)	4.32 (1.46)	1.58 (1.45)
Effective numbers of randomly drawn members (excluding substitutes/ including present substitutes)	16.83 (3.59)	14.97 (4.91)	15.77 (3.49)	13.84 (5.34)
Number of competitive exams	30	32	79	99

Note: The average electoral commission for the assistant professor exam has 33.8 members: 5.4 members of the bureau, 6.6 members of the scientific council, 16.8 randomly drawn titular members, and 5.8 randomly drawn substitutes. Standard deviation in parenthesis.

In a fourth complexity, although the records are of very good quality for a French academic institution overall, there are some holes (Table 2): the results of the electoral commission were not available for one-third of the exams. Of the remaining exams, composition and presence were recorded for two-thirds of the exams, presence for only one-fourth, and composition for only one-tenth. Sample size could be restricted to the exams for which the most information is available, but to do so could have a negative effect on the statistical power.

Table 2 Reconstitution of electoral commissions

	Number of competitive exams			Number of applications			Number of elected applicants		
Electoral commission records	Asst. prof.	Prof.	Total	Asst. prof.	Prof.	Total	Asst. prof.	Prof.	Total
Composition and presence	24	70	94	543	796	1,339	85	196	281
Composition only	5	7	12	56	154	310	15	32	47
Presence only	8	29	37	274	286	560	25	72	97
Subtotal	37	106	143	973	1,236	2,209	125	300	425
Composition known, results of EC unknown	15	35	50	336	325	661	85	98	183
Composition unknown	3	10	13	27	69	96	17	16	33
Total	55	151	206	1,336	1,630	2,966	227	414	641

Note: Twenty-four assistant professor exams recorded both composition and presence at the electoral commission. 543 applications were recorded and 85 persons were elected.

The experimental design is well suited to accurately estimate the effect of having randomly drawn contacts in the electoral commission and to limit this to the population with contacts among the members of the EHESS submitted to the random draw. Not all applicants fall into this case; some do not have contacts or do not have contacts among the EHESS faculty. I must therefore control for those applications outside the experimental framework in order to properly establish the social capital effect.

The model

I therefore model the probability of success (for instance winning a majority of votes at the electoral commission) as a function of the number of contacts among the drawn members of the electoral commission *(drawn)*, the number of contacts among the ex officio members of the electoral commission *(exofficio)*, the number of contacts in the EHESS that do not belong to the electoral commission *(undrawn)*, and a fixed effect for each exam $(exam_j)$.

$$P\,(success) = a.\ drawn + b.\ exofficio + c.\ undrawn + exam_j + u \qquad (1)$$

The causal effect of having a contact in the electoral commission is given by $(a-c)$: the difference between drawn contacts (treatment) and undrawn contacts (control). I can reformulate (1) in the following way, so that $a' = a - c$ is directly estimated :

$$P\,(success) = a'.\ drawn + b'.\ exofficio + c.\ EHESS + exam_j + u \qquad (2)$$

with $EHESS = drawn + exofficio + undrawn$ referring to all members of the EHESS faculty.

Thus I control for applications outside the de facto experimental setting, such as applicants whose contacts are outside EHESS $(EHESS = 0)$ or are nonrandom members of the electoral commission *(exofficio)*. I will not interpret these variables, as I cannot correctly identify the underlying effect (effect of the contact or of unobserved heterogeneity), but I use such variables to isolate the causal effect of the random draw.

In all estimations, I add an exam fixed effect because each exam, with its specific degree of competition, is de facto one experiment, where "treated" and "control" applicants compete against one another. To estimate "experimental exams" more accurately, I will restrict some estimates to exams where I find both treated applicants $(\sum (drawn) > 0)$ and control applicants $(\sum (undrawn) > 0)$.

Links studied

The following presents some details on the links I can investigate for the 2,209 applications for which I know both the members of the electoral commission and the ranking produced during this first step of recruitment (Table 3). I collected the PhD advisor for all applicants.[4] Of the 419 applications that enter the experimental design, 90 percent are "inbred" applications of EHESS PhDs, plus a minority of 10 percent of external applicants whose advisor was hired after their PhD was defended. I also collected all PhD committees for defenses at the EHESS from 1960 to 2005. I can therefore measure for the applications of EHESS PhDs the impact of having other members of the PhD committee on the committee as titular members. Similarly, the more senior applicants may also have invited some EHESS colleagues to be on the PhD committee of one of their students or have been invited by them for the same reason. I consider this invitation relation to be a link when it occurs during the three years preceding the application. I also study more indirect links based on common characteristics, such as the impact of the number of persons with whom the applicant shares the same PhD advisor or discipline.

A specific feature of the EHESS survey is that its archives contain records of public acts of support, either as reference letters examined during the electoral commission meeting or as viva voce support in the faculty assembly. Unfortunately, reference letters were either uncommon or irregularly recorded in the minutes of the electoral commission before 1980, and viva voce support was not recorded in the minutes of the faculty assembly at all between 1980 and 1993. Moreover, it is likely that these two forms of support are not completely independent from the random composition of the electoral commission. If complete applications are not due until after the electoral commission has been composed,[5] decisions to write or request support letters may be modified by the random composition. Support for someone at the assembly that occurs after the result of the electoral commission may be influenced by what happened during the commission's meeting. Nevertheless, for persons who repeat their application – a common feature, since only half of the applicants are recruited at their first trial – support collected during previous trials is clearly independent from the random composition of the electoral commission.

4 It was not rare for some persons to apply without a PhD (like Pierre Bourdieu), especially before 1985. Fourteen percent of the applications fell into this case. For 24 percent of the applicants, I could not find any information on either the PhD or their advisor.

5 Unfortunately, I do not always know the precise date the electoral commission was composed, and I generally do not know the date on which complete applications are due. At the end of the period, the composition of the electoral commission could be decided anywhere from three to six months in advance of the electoral commission meeting. Applications are generally due three months in advance of this event. But reference letters can be sent up to a few days before the electoral commission meeting.

Table 3 Types of links investigated

	Number of links in EHESS	Number of links drawn in EC	Number of links undrawn in EC	Number of applications with links in EHESS	Number of applications with links drawn in EC	Number of applications with links undrawn in EC
EHESS PhD advisor	450	62	357	450	62	357
Other members of the PhD committee	554	62	430	417	61	344
PhD committee invitation link	317	45	236	198	44	159
Coauthor	893	132	667	315	87	274
Same PhD advisor	595	87	473	338	72	297
Same discipline	55,059	6,222	45,015	1,998	1,502	1,982
Reference letters for EC	1,603	133	1,385	774	121	725
Viva voce support in FA	4,340	704	3,203	798	436	758
Letters or viva voce	5,422	806	4,127	1,165	516	1,097
Letters or viva voce in t–1	1,608	171	1,273	413	134	378

Note: 1,603 reference letters were written for applicants: 133 from drawn members of the Electoral Commission (EC), 1,385 from EHESS faculty undrawn in the electoral commission (EC). There were 774 applications with at least one letter from a member of the faculty, 121 with at least one from EHESS faculty drawn in the electoral commission, and 725 with at least one from EHESS faculty undrawn in the electoral commission.

Checking the experiment's validity

Before analyzing the results, I will address the classic question of whether experimental conditions can modify behaviors and bias the results of the experiment. The experiment in question here is not double-blind: the members of the electoral commission know that the applicants they support have applied, and applicants may know that their contacts are members of the electoral commission. This knowledge might favor certain strategic decisions, such as whether to apply (if the electoral commission is constituted before application), whether to withdraw an application, and whether to attend the electoral commission meeting. I will analyze this phenomenon with specific attention to the link considered by previous literature as the most effective form of sponsorship: the PhD advisor–advisee link.[6]

6 Table A1 in the appendix indeed shows that the PhD advisors are very involved in supporting their former advisees. When advisees apply, 39 percent of advisors write reference letters, 39 percent support them publicly in the faculty assembly, and 57 percent support them in either one way or the other.

Studying the question of whether the random draw modifies applicants' behavior is difficult, because this requires a larger population of potential applicants. I therefore use the larger population of EHESS PhDs and analyze the probability that candidates with PhDs from the EHESS will apply for the assistant professor exam in each of the fifteen years that follow the PhD defense. Table A2 shows that having one's advisor randomly drawn for the electoral commission does not substantially change the results. Having contacts within the EHESS clearly counts in whether one applies or not, but the specific fact of having an advisor on or off the electoral commission does not seem to have any impact.

It is easier to determine whether the knowledge of applications influences the probability that an advisor will attend the electoral commission meeting. Table A3 provides such an analysis, and we can see that the experimental conditions are not totally met. The probability that an advisor will attend the electoral commission meeting increases significantly when a former advisee applies. This leads me to privilege the composition of the electoral commission (the *intention to treat* effect) rather than effective presence (the *treatment on treated* effect) here as well.

However, table A4 shows that the random draw of the electoral commission is independent from the characteristics of the applicants and that the main predictors of success at the electoral commission stage (native-born French national, prestigious higher degrees such as the École Normale Supérieure or Agrégation, prior publications, and number of previous applications) have no effect on the probability of whether an applicant's PhD advisor will be on the committee. This result shows that the random draw is not biased and that I can causally interpret the result without fearing some bias due to unobserved heterogeneity or reverse causality.[7]

4 Results

The advisor effect on the electoral commission

The descriptive statistics in table A5 deliver the message of this experiment almost completely. The rate of success at the first step for applicants whose advisors are randomly drawn for the electoral commission is 34 percent, with an average proportion of votes of 28 percent, while that of the control group with undrawn advisors is 20 percent, with an average proportion of votes of 22 percent. In table 4 (model 2), I added exam fixed effects in order to take into account the fact that each exam is actually one experiment. "Contact" is defined here as an applicant's PhD advisor being randomly drawn as either a titular or substitute member of the electoral commission. When the

7 There is therefore no need to introduce control variables in the following regressions.

composition of the commission is not known (one-fourth of the cases), I use presence at the electoral commission meeting. This represents a compromise between the purity of the randomized experience and statistical power. Furthermore, I will show that the results still hold even if I restrict more precisely to the random conditions. I privilege linear probability models in order to estimate dichotomous variables such as being put forward by the electoral commission, but I also test with logistic regression (Table A6) and the results are very close.[8]

The selection of the PhD advisor to the electoral commission increases a former advisee's probability of being put forward by 13 percentage points and increases the vote share by 5 percentage points (not significant). The contrast between these two results may be due to the fact that a PhD advisor will mainly campaign in favor of former advisees when the latter are near the majority threshold.

I then restrict further (model 4 of Table 4), to "experimental exams" where applicants with drawn contacts and those with undrawn contacts compete.[9] The advantage of having a contact inside the jury in this case increases the probability of being put forward to 19 percentage points and the share of votes to 9 percentage points. Part of this result could be biased, however, as I also use exams where I only have presence *(treatment on treated)* instead of composition *(intention to treat)*. Model 4 shows that the drawn advisor effect remains, and its magnitude even increases when restricted only to exams for which I have the composition. Finally, I estimate the advisor effect within two subpopulations, assistant professors (Maîtres assistants and Maîtres de conférences) and full or joint professor exams (Directeurs d'études and Directeurs d'études cumulants). The advisor effect is much stronger and more significant for assistant professors (+22 percentage points in probability of being put forward, +11 percentage points in share of votes) than for professors (+14 points in probability and +6 percent share of votes), where it is lower and not significant (although not very far from the 10 percent threshold). Two reasons could explain this difference, and both are very similar to those found by Zinovyeva and Bagues (2012). First, the link to the former PhD advisor may weaken as time passes after completion of the PhD. Second, it might be easier at professor exams to evaluate applicants on the basis of their scientific records and their personal reputation, and voters might rely less on the comments of those who know the applicant best.

8 There has been recent debate on the respective merits of logistic regression and linear probability models (Moud 2010; Angrist/Pischke 2009). Logistic regression provides a better functional form, especially near the 0 or 1 borders, but its constant variance may call into question the comparison of parameters from one regression to another.

9 Some kind of academic inbreeding has inflated the parameter for undrawn EHESS contacts in exams where no candidates have had contacts drawn, therefore shrinking the final difference with candidates whose contacts were drawn.

Table 4 Applications put forward by electoral commission and vote share in the electoral commission

A Applications put forward (linear probability models)

	1	2	3	4	5	6
Applications whose PhD advisor is						
Randomly drawn member of the EC	0.137** (0.062)	0.129* (0.066)	0.187*** (0.068)	0.220** (0.085)	0.215** (0.091)	0.139 (0.104)
Ex officio member of the EC	0.056 (0.076)	0.019 (0.072)	0.050 (0.081)	–0.002 (0.107)	0.029 (0.089)	0.137 (0.189)
Member of the EHESS	0.040 (0.029)	0.051* (0.027)	0.021 (0.030)	0.014 (0.035)	0.015 (0.036)	0.035 (0.055)
Competitive exam fixed effects	No	Yes	Yes	Yes	Yes	Yes
Field	All competitive exams	All competitive exams	All experimental exams	All experimental exams with composition	Assistant professor experimental exams	Professor experimental exams
Number of applications [n1; n2]	2,209 [357; 62]	2,209 [357; 62]	991 [184; 55]	749 [143; 42]	563 [131; 33]	428 [53; 22]

B Vote share

	1	2	3	4	5	6
Applicants whose PhD advisor is						
Randomly drawn member of the EC	0.059 (0.039)	0.053 (0.039)	0.090** (0.040)	0.098* (0.050)	0.113* (0.057)	0.064 (0.051)
Ex officio member of the EC	0.088 (0.054)	0.050 (0.049)	0.077 (0.060)	0.094 (0.085)	0.017 (0.060)	0.293** (0.108)
Member of the EHESS	0.046** (0.019)	0.053*** (0.016)	0.036* (0.020)	0.041* (0.023)	0.043* (0.024)	0.022 (0.037)
Competitive exam fixed effects	No	Yes	Yes	Yes	Yes	Yes
Field	All competitive exams	All competitive exams	All experimental exams	All experimental exams with composition	Assistant professor experimental exams	Professor experimental exams
Number of applications [n1; n2]	2,194 [357; 62]	2,194 [357; 62]	991 [184; 55]	749 [143; 42]	563 [131; 33]	428 [53; 22]

Note: OLS estimates. Cluster-robust standard errors (by exams) in parentheses. n1 represents the number of applicants whose advisor was eligible but not drawn for the electoral commission, n2 represents the number of applicants whose advisor was drawn for the electoral commission. Experimental exams refer to exams where I find both applicants with undrawn contacts ($n1>0$) and applicants with drawn contacts ($n2>0$).
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.

In order to more thoroughly evaluate the advisor effect and the difference between the *intention to treat* effect and the *treatment on treated* effect, I restrict the sample to experimental exams (as previously defined) for which I know both presence and composition (Table 5). The advisor effect is somehow higher when I consider titular members initially drawn for the committee (+25 percentage points in probability of being put forward, +13 percentage points in share of votes) or advisors who are ultimately present on the electoral commission. This last *treatment on treated* effect may be biased for the reasons explained above, but we may nevertheless be able to measure the *treatment on treated* effect by opting for instrumental variables. In the first-stage regression, I model the probability that an applicant's PhD advisor who has been drawn for the commission will ultimately be present on the commission, based on the type of drawing (titular or substitute). In the second-stage regression, instead of using biased presence, I use the prediction of presence based on clearly random exogenous instruments. The *treatment on treated* effect is even higher, with +29 percentage points in probability of being put forward and +15 percentage points in share of votes. This estimation could be an unbiased estimation of the *treatment on treated* effect of the PhD advisor, provided that advisors influence their colleagues only during the final meeting of the electoral commission.[10]

Table 5 Variations of results depending on the definition of the membership of the electoral commission

	1 Proposed	2 Share of votes	3 Proposed	4 Share of votes	5 Proposed	6 Share of votes	7 Proposed	8 Share of votes
Applications whose PhD advisor is								
Randomly drawn member of the EC	0.219** (0.099)	0.114* (0.059)	0.250** (0.105)	0.130* (0.063)	0.251** (0.117)	0.134* (0.065)	0.286** (0.122)	0.148* (0.074)
Ex officio members of the EC	–0.103** (0.044)	0.094 (0.110)	–0.100** (0.043)	0.095 (0.110)	–0.109** (0.041)	0.092 (0.108)	–0.099** (0.044)	0.096 (0.110)
Member of the EHESS	0.004 (0.044)	0.037 (0.033)	0.002 (0.043)	0.036 (0.032)	0.009 (0.043)	0.039 (0.030)	0.001 (0.044)	0.035 (0.033)
Definition of membership to electoral commission	Drawn as titular or subsidy		Drawn as titular		Presence		Presence predicted with instrumental variables	
Number of applications [n1; n2]	495 [87; 37]		495 [91; 34]		495 [94; 30]		495 [94; 30]	

Note: OLS estimates. In parentheses, robust clustered (by exams) standard errors. n1 represents the number of applicants whose advisor was eligible but not drawn in the electoral commission, n2 represents the number of applicants whose advisor was drawn in the electoral commissions. Field: experimental exams for which I know composition and presence with both treated (n2>0) and control applications (n1>0).
***: p<0.01; **: p<0.05; *: p<0.1.

10 The campaign aspect of the recruitment makes this last hypothesis questionable. Members of the electoral commission who cannot make it to the commission meeting may try to influence their colleagues in advance.

The advisor effect at various stages

How does the selection of the PhD advisor to the electoral commission influence the recruitment process overall? In Table 6, I estimate the different steps of the recruitment process based on model 4 of Table 4, this paper's favorite estimation combining experimental accuracy and statistical power. First, randomly drawn PhD advisors seem to have no influence on the president's support (in the name of the bureau) during the electoral commission meeting. Instead, a PhD advisor probably influences other colleagues: they get an average of 9 percent of the electoral commission (equivalent to themselves and one other person) to vote in favor of their former PhD candidates. This could seem like a rather limited influence, but we must recall that members of the electoral commission do not always support their former PhD advisees; for some recruitment years, they might influence up to two or three other people, a number that can be decisive, especially when the application is near the majority threshold.

Table 6 The advisor effect on different steps of recruitment

Explained variable	PhD advisor randomly drawn effect	N [n1; n2]
1. President's support in electoral commission	–0.018 (0.074)	711 [131; 47]
2. Share of votes in electoral commission	0.091** (0.040)	991 [184; 55]
3. Number of votes in electoral commission	2.060** (0.938)	991 [184; 55]
4. Put forward in electoral commission	0.187*** (0.068)	991 [184; 55]
5. Number of viva voce supports in faculty assembly	0.650 (0.421)	991 [184; 55]
6. Vote share in faculty assembly	0.062 (0.041)	981 [181; 53]
7. Number of votes in faculty assembly	3.908 (3.836)	981 [181; 53]
8. Election in faculty assembly	0.132** (0.060)	991 [184; 55]

Note: Each cell corresponds to a different regression (OLS estimates). The regressions are similar to those used in table 4. I show only the parameter of interest. Cluster-robust standard errors (by exams) in parentheses. n1 represents the number of applicants with an eligible advisor who was not drawn for the electoral commission; n2, the number of applicants whose advisor was drawn for the electoral commission. Field: experimental exams with both treated ($n2>0$) and control applications ($n1>0$).
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.

The impact of the random composition of the electoral commission continues during the faculty assembly, the final and decisive step of the recruitment process. The selection of the PhD advisor in the electoral commission increases by 0.6 the number of persons speaking in favor of the applicant (nearly significant), adds 6 percentage points

to the share of votes (nearly significant), and 13 percentage points to the probability of being elected (significant). These effects are essentially due to the better rank achieved during the first step because of the random selection of the PhD advisor to the electoral commission.

Effects of other contacts

PhD advisors – the usual suspects in academic sponsoring – have a clear effect on academic recruitment that cannot be due to some form of unobserved assortative matching between themselves and their former advisees. But are they the only contacts who influence the recruitment process? In table 7, I analyze the sponsoring effects of other possible contacts, whom I compare to the PhD advisor.

Coauthors, sometimes considered a rather strong collaboration tie (Zinovyeva/Bagues 2010; Combes/Linnemer/Visser 2008), come in second in terms of magnitude. But there is a lack of statistical power here, and the effect is not significant. This might be explained by the fact that within French social science during the period, coauthoring remained rare and socially heterogeneous (with an important fraction of coedited books, which involve less collaboration, among the coauthored publications).

Weaker links, such as other members of PhD committees or members of the same discipline, do not seem to influence the recruitment process. This negative result also tends to show that advisors' involvement is not just a question of thematic or disciplinary similarity with their former advisee. Similarly, PhD committee invitation links for professor exams do not have any measured impact. But if I restrict to external applications, they then have a significant positive impact on the share of votes. At the professor level, one-third of the applications and 44 percent of the applicants put forward are already assistant professors at EHESS. For those applicants who are well integrated into the EHESS institution, multiple channels of influence may exist (such as team and research center memberships). For more external applications, however, PhD links are a way of influencing and entering this institution.

A contact is generally expected to have a positive influence. Surprisingly, I also found a type of contact for which this is not the case: when a contact had the same PhD advisor as the applicant. In professor exams, the random selection of this type of contact lowers the probability of being put forward by 16 percentage points and the share of votes collected by 9 percentage points. Zinovyeva and Bagues (2012), on the other hand, do not find any impact at all for this type of contact. This unexpected result is likely to be specific to EHESS history and its recruitment procedures; EHESS was a central place for the reconstruction of the social sciences in France during the second half of the twentieth century. It was the locus for many burgeoning and often antagonistic schools

of thought, with opposing scholars coming from the same intellectual background who often had the same advisors, in a fractal way (Abbott 2001). This negative effect may therefore be due to the fact that, as PhD solidarity declines with time, EHESS members may want to be their advisor's only intellectual descendant and may be reluctant to hire other rival descendants.

I also focus on the efficiency of declared acts of support, written letters of reference, or the public viva voce support of applicants during the faculty assembly. As stated above, the electoral commission membership is put together before viva voce support at the faculty assembly can be given, and letters may be written before or afterward, meaning that both of these could plausibly be influenced by the composition of the committee.[11] While I cannot claim to identify the causal effect properly, the results are nevertheless suggestive. A letter supporter only has a significant effect on professor exams. A viva voce supporter helps on all types of exams, and increases the share of votes at assistant professor exams. Either form of support significantly increases the probability of an applicant being put forward (all exams and professor exams) and the share of votes (all exams assistant professor and professor exams). Because the decision to support is biased by the composition of the commission, I also consider the case when past supporters of applicants who repeat their application after a failure are drawn for the commission, and hence those supporters not influenced by the random composition of the electoral commission.[12] Past supporters have a clear positive and significant causal effect both on the committee proposal (ranging from 9 percentage points for all exams to 16 for assistant exams) and on its share of votes (ranging from 5 percentage points for all exams to 9 for assistant professor exams). This effect remains significant even when I control for the selection of the advisor to the electoral commission. Although advisors are very likely to actively support their applicants through letters or public declarations in the faculty assembly (57 percent of them do so; Table A1), the supporter effect is not just an advisor effect.

5 Concluding comments

As Weber has pointed out, entering into academia and progressing further in an academic career is "a matter of pure *chance*" – the chance of having a supporter on a recruitment committee (Dreijmanis/Wells 2008). I identified former PhD advisors

11 In fact, when I regress the probability for an EHESS scholar to support a given applicant upon being selected for the electoral commission, I find that commission membership significantly decreases the probability of writing a reference letter but significantly increases the probability of publicly supporting an applicant during the faculty assembly.

12 I successfully verified that there was no significant correlation between these acts of support and being randomly selected for the electoral commission.

Table 7 Different types of links and their causal effect on electoral commission decisions

	All			Assistant professor exams			Professor exams		
	Put forward	Share of votes	N [n1; n2]	Put forward	Share of votes	N [n1; n2]	Put forward	Share of votes	N [n1; n2]
Effect of contact's presence on electoral commission when contact is									
PhD advisor	0.187***	0.090**	991	0.215**	0.113*	563	0.139	0.064	428
	(0.068)	(0.040)	[184; 55]	(0.091)	(0.057)	[131; 33]	(0.104)	(0.051)	[53; 22]
Other member of PhD committee	–0.012	–0.030	1,102	–0.070	–0.065	597	0.058	0.009	505
	(0.066)	(0.033)	[203; 61]	(0.061)	(0.038)	[128; 30]	(0.116)	(0.054)	[75; 31]
PhD committee invitation link	–0.041	–0.018	673				–0.038	–0.016	603
	(0.088)	(0.058)	[93; 41]				(0.091)	(0.060)	[92; 40]
Coauthor	0.062	0.019	1,102	0.094	0.082	380	0.046	0.010	722
	(0.052)	(0.031)	[158; 83]	(0.161)	(0.072)	[28; 11]	(0.055)	(0.033)	[130; 72]
Person sharing the same advisor	–0.055	–0.025	1,016	0.010	0.017	544	–0.159**	–0.092**	479
	(0.042)	(0.028)	[175; 67]	(0.043)	(0.029)	[98; 32]	(0.073)	(0.044)	[77; 35]
Person in the same discipline	0.005	0.004	2,170	–0.009	–0.002	972	0.013	0.002	1,198
	(0.006)	(0.004)	[1,960; 1,493]	(0.007)	(0.005)	[895; 693]	(0.010)	(0.007)	[1,065; 800]
Reference letter author for electoral commission	0.068	0.014	1,178	0.002	–0.007	572	0.100*	0.028	606
	(0.050)	(0.021)	[549; 118]	(0.091)	(0.037)	[203; 42]	(0.052)	(0.024)	[346; 76]
Viva voce supporter in faculty assembly	0.043*	0.029**	1,335	0.037	0.039**	623	0.042	0.023	712
	(0.022)	(0.011)	[744; 434]	(0.035)	(0.019)	[285; 144]	(0.031)	(0.016)	[459; 290]
Letter or viva voce supporter	0.043**	0.027***	1,848	0.025	0.032*	833	0.049*	0.024*	1,015
	(0.020)	(0.010)	[1,023; 511]	(0.031)	(0.017)	[379; 173]	(0.027)	(0.014)	[644; 338]
Letter or viva voce supporter in previous exams	0.086*	0.052**	1,484	0.155***	0.094**	623	0.071	0.043	861
	(0.044)	(0.023)	[308; 130]	(0.052)	(0.037)	[105; 41]	(0.057)	(0.029)	[203; 89]

Note: Each cell corresponds to a different regression (OLS estimates). The regressions are similar to those used in Table 4. I show only the parameter of interest. Cluster-robust standard errors (by exams) in parentheses. N represents the number of the number of applicants, n1 represents the number of applicants who have undrawn eligible contacts in the electoral commission, n2 the number of applicants who have contacts drawn in the electoral commissions. Field: experimental exams with both treated (n2) and control applications (n1).
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.

as among the strongest potential sponsors, with an effect that can double or triple a candidate's odds of being put forward. This effect is very similar to the one found by Zinovyeva and Bagues (2012) in their study of a similar natural experiment in a different institutional setting: a seven-member disciplinary and national recruitment committee in Spain between 2002 and 2006.[13] The striking convergence between the two studies shows that the results can be extrapolated beyond these two cases. Moreover, the results found in these quasi experimental conditions are also strikingly in line with previous nonexperimental studies for which one could also raise concerns about possible unobserved heterogeneity or reverse causality. Contrary to Mouw (2006), then, it would appear that such biases would not threaten the validity of the results in this paper either.

Possible underlying mechanisms

Although some applicants' ties, such as those to a former PhD advisor, have a purely causal effect on the recruitment committee's decision, the reasons underlying such involvement are still not clear. Several mechanisms may contribute to it. First, advisors and advisees share similar scientific preferences, which are at the basis of their PhD collaboration. Perhaps it is less about advisors supporting persons they know than about supporting scientific approaches they like. A second mechanism in terms of information and evaluation costs could lead to similar results, in a somewhat Granovetterian spirit (Yakubovich 2005; Granovetter 1973): advisors are already well aware of what is interesting about their advisees' work, and it is less costly to find and promote the key points of these applicants than those of the applicants an advisor does not know. However, the fact that other members of the PhD committee do not have any effect, even when they may share similar scientific preferences and also be well acquainted with applicants' work, would suggest that these two first mechanisms are not that important.[14]

One could also suspect that the strong personal links to former advisees generate either subconscious or conscious judgment biases. In the first case, because advisors know and like their former advisees, they will subconsciously end up valuing their advisees' scientific contribution. The second case could be seen as an example of the classical "motivation" argument (Obukhova 2012; Granovetter 1973): advisors deliberately

13 They find an advisor effect of 14 percentage points for all exams (18 for assistant professor exams and 10 for professor exams) (Zinovyeva/Bagues 2012: Table A1). Let us turn their results into an odds ratio for better comparability: in Spain, advisors' selection to the committee multiplies the probability of success by 2.6 (3 for assistants, 2.1 for professors). For EHESS, I find an odds ratio of 2 (2.2 for assistants, 1.8 for professors) and 2.9 (3.5 for assistants, 2.3 for professors) when I restrict to experimental exams (cf. logs given in table A6).

14 It is true that members of the PhD committee (chosen in France at the end of the PhD) may have fewer shared scientific preferences with the applicants and less knowledge of their scientific contributions than PhD advisors.

support applicants they like, even though they may feel that their advisees are not the best candidates. New research is needed in order to disentangle the respective power of these four mechanisms.

A public policy issue

As noted previously, the impact of the advisor may contribute to the importance of academic inbreeding, a feature common in many countries and strongly debated. At EHESS, the random selection of applicants' advisors to the electoral commission causes ten more advisees to be put forward than otherwise would have and contributes to one-third of the success differential between inbred (22 percent) and external applicants (16 percent). The probability for inbred applicants to have their advisor on the EHESS recruitment committee is low (1 out of 8), whereas in university departments, especially small ones, it is probably much higher and thus contributes much more to academic inbreeding. The results could also have normative consequences for public policy. Academic systems share (or are supposed to share) the Mertonian ideal of meritocracy and indifference to personal characteristics. Systematic bias in recruitment is prejudicial both to the quality of the academic system and to its equity. On the other hand, academia consists of small communities where people know one another well. Excluding all persons with a potential bias toward an applicant could lead to paralysis. Academic institutions must arbitrage these two risks. One possible way of coping with an important fraction of possible bias without paralyzing recruitment would be to ban the recruitment of inbred candidates, a practice of most American universities since the 1980s (and most mathematics departments in France since the early 2000s).

On the respective efficiency of strong and weak ties

Finally, this natural experiment furthers the debate on the efficiency of social capital and contacts in getting a job, as well as the respective roles played by strong and weak ties. I show that social capital clearly does matter, in contrast to Mouw's (2006) statement. Social capital counts in getting a job when at least one contact is in a position to have a significant influence on the recruitment decision as either a recruiter, counselor of the recruiter, or member of a recruiting committee. In such cases, a given stronger tie (e.g., the PhD advisor) is much more effective than a given weaker tie (e.g., other members of the PhD committee), presumably because of the greater "motivation" of stronger ties (Obukhova 2012; Granovetter 1973).

Before inverting the Granovetterian formula (Krackhardt 1992), however, we must add some nuances. First, the motivation mechanism does not invalidate the information mechanism and may very well coexist with the latter along different channels. Second, the aggregate effect of weak ties must not be downplayed, even where motivation is concerned. Recalling that the probability for a given tie to have an effective role in a recruitment committee is low, and that people have more weak ties than strong ties, we must balance (in terms of mathematical expectation) the strong influence of a lower number of strong ties against the small influence of a much higher number of weak ties.[15]

15 Limited statistical power prevented me from identifying a significant weak-tie effect in my data (aside from the letters of viva voce supporters, which are more difficult to interpret in terms of tie strength). But relying on Zinovyeva and Bagues (2012), I can make the following comparison: the advisor effect (+14 percentage points) is 4.5 times that of another member of the PhD committee. Since PhD committees have an average of four non-advisor members, the expected influence of the other members could reach that of the advisor.

Appendix

Table A1 Types of contacts and supports

	Reference letters		Public support in faculty assembly		Either form of support	
	Percentage	Links	Percentage	Links	Percentage	Links
EHESS PhD advisor	39	404	39	392	57	235
Other members of the PhD committee	16	513	23	478	31	337
PhD committee invitation link	16	313	31	225	41	157
Coauthor	11	1,043	23	604	28	468
Same PhD advisor link	8.3	625	16	472	24	342
Same discipline	1.6	55,237	4.3	48,641	5.1	35,973
Reference letters	(100)	1,761	52	1,002	(100)	1,002
Viva voce support in assembly	14	3,771	(100)	4,968	(100)	3,771
Letters or viva voce	35	5,010	91	5,448	(100)	4,251
Letters or viva voce in t-1	27	1,646	39	1,610	49	1,348
All faculty members	0.46	383,467	1.44	344,594	1.78	239,147

Table A2 Probability for EHESS PhDs to apply depending on the advisor's membership in the electoral commission

Variables	1 (Logit)	2 (OLS)
Number of years since PhD	0.156**	0.00070
	(0.073)	(0.00060)
Squared number of years since PhD	–0.022***	–0.00010**
	(0.006)	(0.00004)
Advisor drawn member of the EC	0.184	0.00300
	(0.183)	(0.00300)
Advisor Ex officio member of the EC	–0.012	–0.00008
	(0.227)	(0.00200)
Advisor member of the EHESS	0.403***	0.00400**
	(0.101)	(0.00090)
Competitive exam fixed effects	Yes	Yes
Field	Assistant professor exams	Assistant professor exams
Number of potential applications	41,530	41,530

Note: The probability of applying to an assistant professor competitive exam is modeled with logistic regression (1) and OLS (2). Cluster-robust standard errors (by exams) in parentheses.
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.
Field: we selected the population of EHESS PhDs who completed their PhD during the fifteen years preceding the EHESS exam (we excluded those who were already hired at the EHESS).

Table A3 Probability of attending the electoral commission meeting

Variables	1 (Logit)	2 (OLS)
Drawn substitute member	–1.405*** (0.146)	–0.306*** (0.031)
Ex officio member	1.060*** (0.154)	0.146*** (0.021)
With at least one PhD advisee applying	0.918** (0.404)	0.133*** (0.048)
Drawn substitute member with at least one PhD advisee applying	0.386 (0.884)	0.053 (0.207)
Ex officio member with at least one PhD advisee applying	1.172** (0.459)	0.093*** (0.023)
Competitive exam fixed effects	Yes	Yes
Field	All competitive exams with composition and presence	All competitive exams with composition and presence
N	2,820	2,820

Note: The probability of attending the electoral commission is modeled both through a logistic regression (column 1) and an OLS model. Cluster-robust standard errors (by exams) in parentheses. The reference category is drawn titular members.
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.

Table A4 Probability of being put forward by the electoral commission and probability of having one's PhD advisor drawn for the electoral commission

	Put forward by EC		Advisor drawn in EC	
Variables	1 (Logit)	2 (OLS)	3 (Logit)	4 (OLS)
Woman	–0.268 (0.164)	–0.028* (0.016)	–0.1190 (0.4910)	–0.0060 (0.0850)
Born outside France	–0.434** (0.201)	–0.042** (0.019)	–0.1520 (0.7020)	–0.0130 (0.1090)
École Normale Supérieure alumni	0.574*** (0.222)	0.093*** (0.032)	0.8290 (0.9250)	0.1520 (0.1580)
Agrégation (High School professor exam)	0.491** (0.206)	0.052* (0.026)	–0.2440 (0.9680)	–0.0250 (0.1590)
Already member of the EHESS	0.930*** (0.172)	0.124*** (0.022)	–0.6310 (0.7000)	–0.1490 (0.1410)
Age	–0.045*** (0.013)	–0.005*** (0.001)	–0.0003 (0.0450)	0.0002 (0.0090)
Anthropology	0.210 (0.222)	0.021 (0.025)	0.4630 (0.9620)	0.0740 (0.1370)
History	0.291* (0.165)	0.031 (0.019)	0.5220 (0.7490)	0.0890 (0.1170)
Sociology	0.011 (0.221)	–0.009 (0.023)	0.4010 (0.9160)	0.0660 (0.1340)
Economics	0.095 (0.272)	0.008 (0.031)	0.6630 (1.3110)	0.0810 (0.2400)
Number of previous trials	0.487*** (0.173)	0.058*** (0.018)	–0.5250 (0.6220)	–0.0860 (0.1070)
Square number of previous trials	–0.034 (0.026)	–0.004 (0.003)	0.1050 (0.1090)	0.0200 (0.0180)
Number of publications	0.018*** (0.004)	0.003*** (0.001)	0.0150 (0.0330)	0.0020 (0.0040)
Competitive exam fixed effects	Yes	Yes	Yes	Yes
Field	All competitive exams	All competitive exams	All competitive exams. Applications with advisor at EHESS drawn or undrawn	All competitive exams. Applications with advisor at EHESS drawn or undrawn
N	2,171	2,171	418	418

Note: The probability of being put forward is modeled both through a logistic regression (column 1) and an OLS regression. Cluster-robust standard errors (by exams) in parentheses. The reference category is Ex officio members (member of the bureau or the scientific council).
***: $p<0.01$; **: $p<0.05$; *: $p<0.1$.

Table A5 Applications put forward by the electoral commission and average share of votes depending on the advisor's membership in the electoral commission

	Put forward		Share of votes		Put forward		Share of votes		Put forward		Share of votes	
	%	N	Mean (s.d.)	N	%	N	Mean (s.d.)	N	%	N	Mean (s.d.)	N
Applications whose PhD advisor is												
Randomly drawn member of the EC	34	62	28.1% (0.334)	62	37	54	31.3% (0.345)	54	38	48	30.0% (0.329)	48
Member of the EHESS outside electoral commission	20	357	22.1% (0.262)	357	20	365	21.8% (0.260)	365	20	371	22.1% (0.265)	371
Member of the EC as a member of scientific council	31	13	30.4% (0.307)	13	31	13	30.4% (0.307)	13	31	13	30.4% (0.307)	13
Member of the EC as member of the bureau	22	18	31.2% (0.323)	18	22	18	31.2% (0.323)	18	22	18	31.2% (0.323)	18
Outside EHESS	16	1,759	17.5% (0.269)	1,744	16	1,759	17.5% (0.269)	1,744	16	1,759	17.5% (0.269)	1,744
All applications	17	2,209	28.1% (0.334)	2,194	17	2,209	31.3% (0.345)	2,194	17	2,209	30.0% (0.329)	2,194
Definition of membership of the electoral commission	Drawn as titular member or substitute (if available, presence otherwise)				Drawn as titular member (if available, presence otherwise)				Presence (if available, composition otherwise)			

Table A6 Applications put forward by electoral commission depending on the membership of the electoral commission

	1	2	3	4	5	6
Applications whose PhD advisor is						
Randomly drawn member of the EC	0.707** (0.295)	0.736** (0.359)	1.082*** (0.379)	1.251*** (0.463)	1.253** (0.520)	0.827 (0.546)
Ex officio member of the EC	0.320 (0.405)	0.168 (0.509)	0.420 (0.616)	0.019 (0.899)	0.232 (0.728)	1.222 (1.088)
Member of EHESS	0.272 (0.177)	0.403** (0.193)	0.202 (0.271)	0.133 (0.294)	0.169 (0.376)	0.257 (0.374)
Competitive exam fixed effects	No	Yes	Yes	Yes	Yes	Yes
Field	All competitive exams	All competitive exams	All experimental exams	All experimental exams with composition	Assistant professor experimental exams	Professor experimental exams
Number of applications [n1; n2]	2,209 [357; 62]	2,209 [357; 62]	991 [184; 55]	749 [143; 42]	563 [131; 33]	428 [53; 22]

Note: Logistic regressions. Cluster-robust standard errors (by exams) in parentheses. n1 represents the number of applicants whose advisor was eligible but not drawn in the electoral commission, n2, the number of applicants whose advisor was drawn in the electoral commissions. Field: experimental exams with both treated (n2>0) and control applications (n1>0).
***: p<0.01; **: p<0.05; *: p<0.1.

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