The Success of Randomized Controlled Trials: A Sociographical Study of the Rise of J-PAL to Scientific Excellence and Influence

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Arthur Jatteau [*]

Abstract: *»Der Erfolg randomisierter kontrollierter Studien: Eine soziografische Studie des Aufstiegs von J-PAL zu wissenschaftlicher Exzellenz und wissenschaftlichem Einfluss«.* Randomized controlled trials (RCTs) are a method to assess impact that has become increasingly popular over the last fifteen years, particularly as a result of the work done by Esther Duflo and her Poverty Action Lab (J-PAL), an organization devoted to the promotion of randomization. This article aims to explore and understand this success by using an in-depth sociographical study of the J-PAL and a network analysis of economists who use RCT. J-PAL appears to be a concentration of educational and academic capital that give great legitimacy to the RCT method. The network is controlled by certain leaders who are able to diffuse the J-PAL approach to RCTs. Furthermore, this article argues that it is necessary to go beyond the intrinsic quality of this method to explain how it became so popular.

Keywords: Randomization, geometrical data analysis, prosopography, multiple correspondence analysis, hierarchical classification, network analysis, sociology of economists.

1. Introduction

Randomized controlled trials (RCTs)[1] are a very trendy quantitative method to assess impact, used both in development economics and the evaluation of public policies. Little known fifteen years ago, it is now broadly considered as the "gold standard" of evaluation methods. The French-American economist Esther Duflo, a MIT professor of economics, plays an important role in promoting RCTs. In 2003, she cofounded a lab, the J-PAL (Poverty Action Lab), which runs many random experiments.

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[1] Also known as "randomized controlled experiments" or more simply "randomization."

The idea behind RCT is quite simple. As medical RCTs, RCTs use randomness to build groups (treatment and control) that are as *similar* as possible (Glennerster and Takavarasha 2013; Jatteau 2013a). The impact is simply measured by the differences of outcomes between the groups. The randomness maximizes the odds that comparable groups will be formed. It aims to resolve the core problem of the evaluation, the counterfactual, in other words, knowing what would have been the situation of the treatment group without the treatment. Indeed, to assess the impact of a treatment, we need to know what would happen without the treatment. If monetary incentives are given to teachers to be present at school during an academic year, and then, at the end of the year, their absenteeism actually decreases, one can't conclude that the treatment works. To say that, we need to know what would have been the absenteeism without the treatment. Methods exist to address such a situation, including regression in discontinuity, differences in differences, matching, etc. (Angrist and Pischke 2009, 2015), but none is as efficient as randomization to maximize the odds of forming comparable groups.

Contrary of what Esther Duflo and her colleagues sometimes say (Banerjee and Duflo 2011), this method is not new at all (Jatteau 2016). The first such experiments were launched as early as in the 1920s (Boruch, De Moya and Snyder 2002; Dehue 2001; Levitt and List 2009). After World War II, the number of clinical randomized trials increased sharply, followed by RCTs spreading into economics during the 1970s in the USA (Gueron and Rolston 2013). During the 1980s, they went out of fashion, making a comeback at the beginning of the first decade of the 2000s in the area of development economics (Banerjee and Duflo 2011).

Today, this method of evaluation is used mostly in poor countries (Duflo 2009) but also in rich ones, like France and the USA. Many different sectors are covered, such as education, health, agriculture, environment, microfinance, governance, labor markets and the like. For example, some economists try to assess the impact of free text books (Glewwe, Kremer and Moulin 2009) and flipcharts (Glewwe et al. 2004) on student progress, deworming on school absenteeism (Miguel and Kremer 2004), repayment frequency on default in microfinance (Field and Pande 2008) and so on.

The J-PAL, headed by Esther Duflo, Abhijit Banerjee, and Benjamin Olken, was central to the extension and popularization of RCT methodology at the beginning of the new millennium. Since its creation in 2003, 876 RCTs in 80 countries have been launched by the lab. The particularity of this lab is that it is structured around *one* and only *one* methodology: randomization. A total of 158 scholars are affiliated to it. The J-PAL, with its "sister" organization Innovations for Poverty Action (IPA) is able to collect a lot of money to run projects, estimated at around $300 million since 2003 (Jatteau 2018). Funding comes from different sources, from international organizations like the World Bank or DFID (Department for International Development, the British aid

agency) to private foundations, like the Bill and Melinda Gates Foundation (Servet 2018).

Despite a few critical voices, like Angus Deaton, who won the Nobel Prize in 2015 (Deaton 2010, Deaton and Cartwright 2016), this methodology has been successful from different points of view, including scientific, institutional, academic, and political. Scientifically, RCTs are largely seen as an effective method to assess impact, and most often as the best one (Banerjee 2007). In many courses or textbooks, it is presented as an ideal to reach (Angrist and Pischke 2009; Glennerster and Takavarasha 2013).

An examination of research organizations confirms this success. Many research centers conduct projects that use this methodology, such as CEGA (Center for Effective Global Action) in Berkeley, LIEPP at Sciences-Po Paris, or IPP at the Paris School of Economics in France. All of these labs use the RCT methodology, often seeing it as the best one to use when possible. The World Bank has been totally converted to randomization, following an offensive from the principal promoters of this method, based on a report pointing out the lack of evaluation done within the institution (Kremer 2006; Duflo 2006). The Development Impact Evaluation (DIME) department was created in 2005, where some economists are former J-PAL members, and has since launched RCTs directly (The Lancet 2004). Some of them are funded by the SIEF (Strategic Impact Evaluation Fund), created by the World Bank. Other development agencies also use RCTs (French Development Agency,[2] Department for International Development and so on).

People who run RCTs have acquired distinguished positions in the academic field. For instance, between 2010 and 2015, out of six Clark medals (which are awarded to young economist working in the USA for his or her contribution to economic thought), four have been given to researchers who are J-PAL affiliates today (Esther Duflo, Amy Finkelstein, Raj Chetty, and Roland Fryer).

This success goes beyond the academic world. Media coverage of this methodology, often through Esther Duflo, is very impressive (Parker 2010). Because of the simple methodology, which appears to refresh development economics, RCTs enjoy media recognition rarely achieved in the field of economics.

Last but not least, the very broad political acceptance of the RCT approach should be underlined, especially in a science such as economics, which is subject to ideological disputes. In the USA, the acknowledgements come from top figures in the administration, as shown by Duflo's appointment to the Global Development Council, a team of economists tasked with advising President Obama on development. A statement by the Office for Management and Budget in 2009 recommends the use of "rigourous evidence to run policy," using the

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[2] However, the French agency no longer uses this method, following a critical analysis by their economists (Bernard, Delarue and Naudet 2012b).

same words as the title of a book by Karlan (Karlan and Appel 2011), a prominent J-PAL member. In France, governments on different sides of the political spectrum have acknowledged Duflo's success.

In many cases, methods, theories, or concepts need decades to be disseminated and to then dominate (Latour and Woolgar 1979; Desrosières 1998; Pestre 2006). Much to the contrary, randomization has become, in just a few years, a well-known and established method. The data collected by William Savedoff (2013) show an explosion of RCTs since 2006 (less than five each year before 2000, around 70 at the beginning of the 2010 decade). The speed of this numerical success merits further study. How is it possible? What type of explanations can be found?

A first simple explanation could be the method itself. Its great simplicity makes it understandable in a few minutes by anybody, with no background in economics or statistics. This simplicity partly explains the seductive power of this method, which contrasts with the development of contemporary econometrics, too sophisticated to be able to be understood by non-specialists (Imbens and Wooldridge 2009).

RCTs should be placed in the broader picture of the rise of the evidence-based policy movement in rich countries (Sutcliffe and Court 2005). Its philosophy of public action aims to base the legitimacy of public policies on scientific evidence, just as the effects of drugs and treatments have to be scientifically proven in medicine. Evidence-based policy is more and more fashionable in countries like France and the USA. This could explain the success of randomization: as medical RCTs are supposed to be the best method available to assess the effects of a medical treatment (Sackett 2000; Sackett et al. 1996), RCTs should be considered as the best way to prove impact in public policies (Ferracci and Wasmer 2011).

The economic crisis, which has now lasted for 10 years, has led to a decrease in public assistance. Simultaneously, interest in evaluating the effect of this spending has (re)appeared. The need to evaluate the impact of public spending has become more important, a point that Duflo and her colleagues have perfectly integrated (Duflo 2010b, 2010a). Where there is less money to spend, everyone wants to know precisely what its effects are.

The first academic field where randomization returned center stage was development economics. In the early 2000s, the "Washington Consensus" had eroded and there was no longer a dominant paradigm in this area of research (Labrousse 2010). The radical solutions proposed by the Washington Consensus (liberalization, privatization, deregulation and the like) did not give the expected results in many countries (Berr and Combarnous 2004). RCTs took advantage of this lack of dominant theory of development. The former more arrogant attitude was substituted with a more modest one, where the question is not to say what to do, but to follow a path (i.e. randomization) to find out what

to do, without any prior ideological positions. The consensus should be built not on solutions, but on methodology (Jatteau 2013b).

Finally, it is important to highlight the methodological activism of J-PAL researchers on randomization. It was so strong that Ravallion (2009) and Deaton (2010) invented the term of "randomistas" as a nickname for them. Because they strongly believe in the superiority of their method, "randomistas" are very proactive in promoting it, in academic papers (Banerjee and Duflo 2009) but also in publications made for a wider audience, such as books (Duflo 2010b, 2010a; Karlan and Appel 2011) or policy briefs. They also organized a lot of training, all over the world, to spread the methodology to different types of people (researchers, NGO workers, officials and so on) and, above all, to show how superior randomization is to other methods.

As we have seen, there are many factors that influence the success of randomization, including the simplicity of the method, the rise of the evidence-based policy approach, crises in public assistance and public spending, the decline of the Washington consensus, and the activism of J-PAL affiliates. All of these points are important, but not a sufficient explanation.

Surprisingly, what can be called the "randomization phenomena" has not often been studied from a sociological point of view. A few ethnographical studies have been done, in developing countries (Jatteau 2013b; Quentin and Guérin 2013) as in rich ones (Devaux-Spatarakis 2014), but no study has been conducted using a sociology of economists approach (Lebaron 2000, 2013; Colander and Klamer 1987; Klamer and Colander 1990; Fourcade, Ollion and Algan 2015). A sociology of economists using RCTs, which we propose to call "randomists," is interesting in itself, as it can give useful and precise information on who they are, where they come from, and what their position is in the field of economics, all of which are characteristics that may contribute to the success of their method. Indeed, we think that the success of any methodology is not only the result of the quality of the method (Latour and Woolgar 1979), but also of the social characteristics, the relationships and the social and cultural capital of the proponents (Fligstein 1990; McGuire, Granovetter and Schwartz 1993; Granovetter and McGuire 1998).

To explore this hypothesis, we need to take a closer look at the randomists. But, since this category is rather spurious, we risk ending up talking about every economist who uses RCTs. To gather data on such a population would be quite impossible and, more importantly, might not really be of use in uncovering the rise and basic workings of the randomization phenomena. Instead, we will directly study the institution at the heart of the phenomena: J-PAL and its researchers. It is the only organization at this level to be based *only* on the RCT methodology. Contrary to other professional organizations, this laboratory gathers economists through a unique approach, which makes them a coherent group. For these reasons we decided to focus exclusively on J-PAL affiliates. We investigate how their social and academic characteristics explain the fact

that RCT is largely viewed as the "gold standard" and how these characteristics have facilitated the diffusion and the extension of the methodology.

Our study is based on a prosopographical database, which contains all researchers (n = 131) who were affiliated to the J-PAL from its creation in 2003 to 2015. We collected a large body of data, mainly from curricula vitae (CVs) and institutional websites (J-PAL, academic journals, and universities) focusing on studies and professional positions. The data was analyzed using classical statistical tools (cross-tables) and through geographical data analysis (multiple correspondence analysis and hierarchical classification).

We also used network analysis to explore the structure of the links between randomists. Using network analysis makes it possible to collect additional insights that go beyond the prosopographical information. Indeed, the social and academic characteristics are not the only ones to take into account; relationships also need to be studied.

First, we show to what degree J-PAL can be considered as a lab of the elite(s). This elitism, highlighted through the prestigious studies the randomists have conducted and the important professional positions they hold, provides a first explanation of the success of this method. Focusing on the experience, studies, and professional position of lab members we are able to give a detailed account of the lab's structure. Second, our network analysis shows how this methodology is kept "under control," as there are only a few leading agents able to impose their vision of RCT. They ensure and guarantee a proper and unique way of using this methodology, which can be seen as a second and complementary explanation of its success.

2. The J-PAL: The Lab of the Elite(s)

The hypothesis investigated in this section is that a part of the RCT's success could be explained by the high academic capital[3] possessed by randomists, distinguishing them as members of the academic elite, based on the fact that academic capital is a necessary condition to legitimate a method.

2.1 The Overrepresentation of Top Universities in Randomists' Studies

Looking at the BA obtained by J-PAL randomists gives an initial indication as to the elitism of the laboratory. A total of 66.4% of those who were awarded their BA in France, in the UK, or in the USA obtained it at a top university. J-PAL randomists have, for the most part, been attending prestigious institu-

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[3] What I call "academic capital" here is all the cultural capital coming from the academic field: degree, professional positions, editorial positions and the like.

tions from an early stage, although the first years of studies might not be so important to an academic career. Even without been practically able to gather data on the percentage of all people who have a BA from a top university in the whole world, we might think that it is far less than the randomists' group.

Method

The prosopographical database was constructed using information collected mainly from randomists' CVs and online sources (including the J-PAL website) and was completed by creating our own variables, useful for the analysis.

The first and the most important one is the top university variable. Comparing academic systems around the world is quite complicated, as there are many particularities. We were interested in academic capital owned by J-PAL affiliates. But since all individuals but one hold a PhD, the quantity of this capital is less important for us than its quality. The prestige of the institution the degree has been received from and where the randomists work are an interesting proxy for it. We used the "Ivy Plus"[4] league, which brings together the most prestigious US universities.[5] But since the majority of J-PAL members not only studied in the USA, but also in Europe (79.2% hold a US PhD and 41% don't have a US BA), we needed to take account of the J-PAL randomists' internationalization during their studies, with two countries being significantly represented: France and the UK. The importance of France goes back to Esther Duflo, who was born in France and pushed for French members to be included (the European bureau was opened in Paris, for example). Hence the "grandes écoles,"[6] which can be seen as high-level and very selective, with the important fact that, as Ivy League, their prestige is undisputed, are included in the top university variable.

The elitist character of randomists becomes clear when we look at their PhDs: 44.6% were awarded a PhD by Harvard or MIT, rising to 59.2% when Berkeley and Princeton are included. When considering our top universities variable, 73.8% of the J-PAL randomists hold a PhD from one of the included universities.

This number can be examined in more detail. As the majority of the universities that form this variable are American, it might be interesting to look for people who obtained both their BA and their PhD at an American university, which can be seen as a good proxy for having done all their studies in the US. In this sub-population 88.9% received their PhD from a top university. This

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[4] The Ivy League includes Brown University, Columbia University, Cornell University, Dartmouth College, Harvard University, University of Pennsylvania, Princeton University, and Yale University. The Ivy Plus adds the Massachusetts Institute of Technology (MIT), Stanford University, University of Chicago, and Duke University.

[5] We ran statistics with other variables to capture the prestige of American universities, such as the Shanghai ranking or the IDEAS ranking of economics departments, but the results are very similar.

[6] Polytechnique, EHESS, ENS, Paris School of Economics, Sciences-Po, HEC. Two professional institutions, which are not universities, were also included, considering their reputation: INSEE and CNRS.

reveals J-PAL attractiveness *and* selectivity: it is rather unlikely for American students without a degree from a top university to be affiliated with J-PAL. J-PAL attracts the best students and can select from them. This number should be compared with the percentage of all PhDs in economics obtained at elite universities, which is, as we calculated from Stock and Siegfried (2015) and data from the American government,[7] around 20%, whereas for J-PAL re-searchers who did their PhD in the USA, it is 80.6%.[8] By comparing the coun-try where the PhD has been obtained, it can be shown that selectivity is higher for those who got it in the USA than for the others, since only 48.1% of those who were awarded a PhD outside the USA were from a top university.

To better grasp the importance of institutions awarding PhDs it is useful to analyze the age distribution in the laboratory in relation to PhDs from top uni-versities (see Table 1).

Table 1: PhD from Top University, by Age

	PhD from non-top university	PhD from top university	Total
31 to 35 years old	18.8%	81.2%	100%
36 to 40 years old	30.3%	69.7%	100%
41 to 50 years old	30.6%	69.4%	100%
50 years old +	56.2%	43.8%	100%
Total	30.8%	69.2%[9]	100%

This table reveals an interesting finding: the older randomists are, the smaller is the proportion with a top university PhD. The explanation is probably that the oldest economists have more than their degrees to make them valuable for the J-PAL, as the youngest have not had the opportunity to prove anything, except obtaining degrees from top universities. For the oldest researchers, it is proba-bly more their professional and institutional positions, in particular their publi-cations, that could explain their J-PAL affiliation.

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[7] <http://www.nsf.gov/statistics/2016/nsf16300/data-tables.cfm> [Accessed August 8, 2018].
[8] This number is less than the previous one because some people awarded a PhD in the USA didn't obtain their BA in the USA.
[9] This number is slightly different from the 72.8% mentioned before, since the researchers about whom we have no information on their age are not taken into account here.

Table 2: PhD from Top Universities, by Year of Affiliation

	PhD from non-top university	PhD from top university	Total
2003-2006	13.3% [2]	86.7% [13]	100% [15]
2007-2009	43.5% [10]	56.5% [13]	100% [23]
2010-2012	14.3% [3]	85.7% [18]	100% [21]
2013-2015	26.8% [19]	73.2% [52]	100% [71]
Total	26.2% [34]	73.8% [96]	100% [130]

Last but not least, looking at the year researchers got affiliated with the lab again gives us an idea of its attractiveness/selectivity. The large majority of the first generation of J-PAL economists (2003-2006), those who founded the lab, holds a PhD by a top university. This is not surprising, since launching of a new laboratory requires significant academic (and financial) resources. In the second period (2007-2009) the number of scientists affiliated to the lab needed to be increased in order to reach a critical size and secure the existence of the structure, leading to a reduction in the lab's selectivity. Once this was achieved, the selectivity of the recruiting process increased again (2010-2015), from 56.5% to 85.7% and 73.2%. This rise could be seen as the symbol of the success of randomization among scholars.

2.2 The Prestigious Positions of the Randomists

The randomists do not only benefit from their studies, but also from their professional positions. A total of 54.2% of them work at a top university. This figure rises to 66% if we consider those working in the USA (71.8% of all J-PAL affiliates). It could be considered as a sizeable proportion at a glance, but it is even more impressive if we compare this with teachers working in American universities with more than 10,000 students and which deliver PhDs,[10] of whom only about 5% work in a top university. Therefore, it is clear that top university professors are overrepresented in J-PAL. Even if we change the way we classify the universities, taking the Shanghai ranking or the IDEAS website ranking, the results do not change significantly. No matter how we define academic elitism, the majority of J-PAL affiliates are members of the respective elite.

Assessing the professional positions of J-PAL members is also challenging, since a "Gates Professor" at Harvard such as economist Michael Kremer, or a "Ford Foundation International Professor" at MIT, such as Abhijit Banerjee, is

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[10] This subgroup of American universities fits best with universities included in the top university variable.

not the same as a non-tenured assistant professor elsewhere. Furthermore, comparing professional positions across countries entails new difficulties due to different university systems: for example, where France has two positions – *maître de conferences* and *professeur des universités* – the USA has three – professor, associate professor, and assistant professor. In order to capture these differences we developed an original variable of professional positions ranked by prestige: full professors with sponsored professorship (Position 1), full professors (Position 2), and other professorships (Position 3). In total, 29.8% of all J-PAL affiliates working in the USA hold the most prestigious position.[11]

When we look at the 131 J-PAL affiliates, 21.4% are in Position 1, 27.5% in Position 2, and 51.1% in Position 3. Among the J-PAL economists from the USA, 50% are professors (Position 1 and 2). This figure should be compared with those in the Almanach of Higher Education, published in 2007 by *The Chronicle of Higher Education*: professors appear to be overrepresented in J-PAL compared to academic teachers in the USA (only 29.5% of them are professors).

The high level of prestige enjoyed by members of J-PAL due to their academic positions is very clear. But their positions can be further qualified by looking at the affiliations they have with other institutions used by economists as important signs of distinction. These affiliations can be interpreted as symbols of their importance in the academic field and are forms of acknowledgement by colleagues (c.f. Schmidt-Wellenburg 2018). Since there are many institutions economists are affiliated with, we restrict our analyses to the most important in the field: NBER (National Bureau of Economic Research, a leading association in the economics field), BREAD (Bureau for Research and Economic Analysis of Development, an organization that aims to support research in development economics), CEPR (Centre for Economic Policy Research, which can be seen as the European NBER) and IZA (Institute for the Study of Labor, which focuses on labor markets).

A total of 50.4% of J-PAL economists are affiliated to NBER, rising to 68.1% if we restrict the population to those working in the USA, as the NBER is mainly a US-anchored institution.

	All J-PAL affiliates	Only affiliates working in the USA	Only affiliates working in Europe
NBER	50.4%	68.1%	–
BREAD	36.4%	41.5%	–
CEPR	18.3%	–[12]	31.8%
IZA	16%	–	22.7%

[11] As Position 1 refers only to sponsored (full) professors, there is almost no one who is in Position 1 outside the USA. The only exception is Orazio Attanasio, at University College London, who is Jeremy Bentham Professor of Economics.
[12] Irrelevant.

A total of 67.9% of J-PAL affiliates belong to at least one of the organizations. It is difficult to compare these figures to others, but it is clear that J-PAL affiliates are massively present in highly prestigious professional organizations and are important in the field of economics.

Looking at the studies they have conducted and the professional positions they hold, J-PAL's randomists are on top of the academic world. The link with the current success of randomization seems to work in both directions. First, the J-PAL members' high level of academic capital could explain why the method has become more and more popular among economists. The idea is the following: if the best economists use this method, it might be because this is the best method. The academic capital of economists who use this method is transferred to the method itself. Second, its success could also attract successful people: success attracts success. Once the randomization is set up in the field, a "winner takes all" effect appears and more and more people want to join the movement, leading in recent times to the J-PAL affiliation of Amy Finkelstein and Roland Fryer, both Clark medal laureates.

2.3 A Lab Structured by Experience and Prestige

Above we compared J-PAL with the rest of the field of economics, examining possible explanations for the success of its RCT methods. In addition, we will now analyze J-PAL in greater depth, to see if its structure can explain the success of the methods used.

Method

Drawing on our prosopographical database we ran a MCA (Multiple Correspondence Analysis), completed by a Hierarchical Classification (HC) using the package FactoMineR in the R software choosing the following nine variables considered to be the most important as active (22): age (3), member of J-PAL's board of directors used as a proxy of the importance of role in the lab (2), the year of affiliation to take into account seniority in the lab (3), holding a top university PhD or not (2), working in a top university or not (2), the level of the position (3), belonging to a professional institution or not (2), the number of ties to other researchers working together on an experiment (3),[13] being an editor of at least one of the top five academic journals in economics (2).[14]

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[13] This number refers to the network analysis we performed on the RCTs run by J-PAL economists. See the following section.

[14] We selected the *American Economics Review*, the *Journal of Economic Literature*, the *Quarterly Journal of Economics*, the *Journal of Political Economy*, the *Review of Economic Studies*, and *Econometrica*.

Table of Contributions

	Dim 1	Dim 2	Dim 3	Dim 4
board_of_directors_no	2.41	0.34	0.18	2.76
board_of_directors_yes	10.64	1.51	0.80	12.19
31 to 40 years old	10.36	9.41	0.02	3.11
41 to 50 years old	6.34	2.55	10.33	3.50
50 and more	2.01	7.50	33.78	0.01
2003-2006	11.88	4.72	0.25	10.84
2007-2012	0.14	2.35	4.12	5.70
2013-2015	1.67	0.04	3.33	11.51
phd_elite_no	0.83	18.51	0.01	3.02
phd_elite_yes	0.29	6.55	0.00	1.07
position_level_1	8.74	1.34	17.43	2.62
position_level_2	2.41	22.18	5.52	2.41
position_level_3	9.21	7.05	1.00	4.70
p1_elite_no	3.43	3.69	4.45	0.30
p1_elite_yes	2.94	3.16	3.81	0.26
0 institution	5.38	2.09	2.77	5.67
1 to 4 institutions	2.30	0.89	1.19	2.43
0 to 4 degrees	0.74	1.33	3.36	18.40
5 to 20 degrees	1.21	0.01	1.27	1.20
21 to 86 degrees	10.41	1.24	0.08	6.43
editor_no	0.67	0.35	0.63	0.19
editor_yes	6.00	3.18	5.66	1.68
MEAN	*4.55*	*4.55*	*4.55*	*4.55*

The first dimension (19.51% of inertia) could be seen as an experience and professional insertion dimension, as it opposes senior researchers, who often hold Position 1, know a lot of randomists, are editors and sit on the board of directors, to Position 3 researchers, who are younger and don't belong to many professional organizations. This is a classical opposition in many organizations, which highlights the existence of two "divisions" in the lab. Although all of them are J-PAL affiliates, they do not belong to the same group. The lab binds together economists at different career stages.

Graph 1: MCA (Axis 1 and 2)
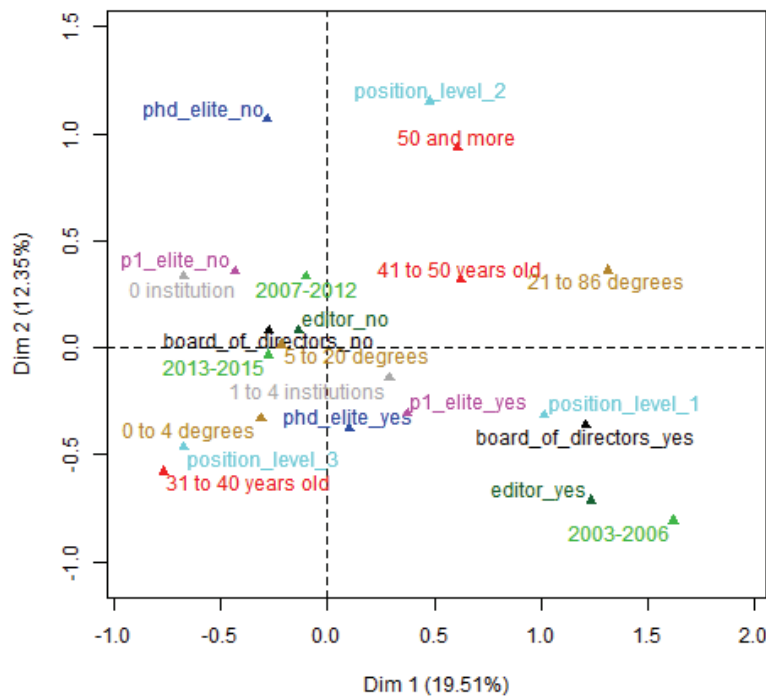
The second dimension (12.35% of inertia) is an age and studies opposition. The oldest researchers, who do not hold a PhD from a top university, are opposed to the youngest, who hold a PhD from a prestigious institution. This result supports the hypothesis that senior researchers rely on forms of capital not linked to their degree and university socialisation, whereas juniors have to prove their level by "objective" evidence such as prestigious degrees. Comparing the first and the second axis, professional position is significantly more structuring in the lab than different degrees. This can be interpreted as a kind of meritocracy consideration in the J-PAL philosophy: the professional position, which to a large extent depends on the research one has conducted, is of more importance than the prestige of the university degree held. This explains why for the youngest, who don't have the time to produce a lot of papers, top university PhDs are so fundamental to enter the lab.

Graph 2: MCA (Axis 3 and 4)
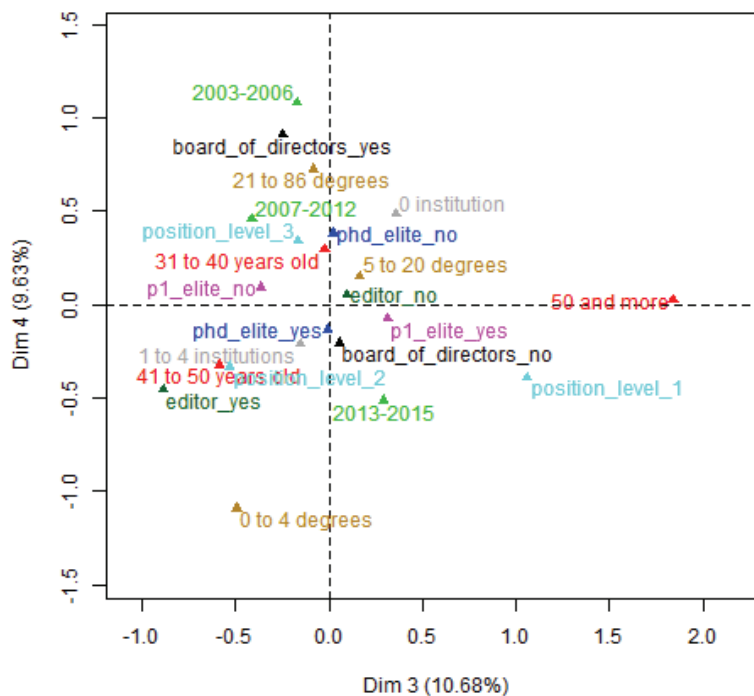
The third dimension (10.68 % of inertia) is also structured by age and professional prestige, which makes it similar to the first dimension. The opposition is here between the midcareer researchers, often at Position 2, and the oldest Position 1 researchers. The fourth dimension (9.63% of inertia) is about seniority in the lab. On the one hand, there are researchers who have been recently affiliated to the lab and who know few other randomists, and on the other hand, we find those who joined in the first years of the lab and are now members of the board of directors and know many randomists.

   This MCA highlights how the laboratory is actually structured. In particular, the first dimension is in line with the results from the network analysis presented in the next section, showing the existence of leaders (defined as researchers with a high degree of centrality). Indeed, the opposition between senior economist and junior economists is often present in the practice of RCTs. Headed by senior *and* junior researchers experiments work as if the former gives methodological approval to the latter, in charge of the RCT practical organization. The second dimension points to two different forms of selectivity in the laboratory: either you are young and you hold a top university PhD to prove your quality or you are older and your academic work reduces the need of having a high level academic degree.

To complete this MCA, we ran a Hierarchical Clustering to work out interesting ways to gather J-PAL economists. The hierarchical tree suggests a clustering into three or six clusters. The three clusters are easier to interpret; the six clusters give us more precise and subtitle information, and a more revealing picture of the J-PAL:

1) The "newbies" (30%). Almost all individuals in this cluster have been affiliated to the lab very recently, are in their 30s and hold an academic Position 3.
2) The "young ambitious" (18%). They have arrived at the lab during the development phase (2007-2012), are still in Position 3 and most of them work at a non-top university.
3) The "elders" (8%). Most of them are older than 50, hold a Position 2 and did not receive a PhD from a prestigious university. They are often located at the margins of the lab.
4) The "mid-careers" (18%). They are in their 40s and hold an academic Position 2. Unlike the elders, they are often affiliated to one institution only and stand at an important point in their career.
5) The "prestigious catches" (15%). They all have an academic Position 1, often at a top university, (almost all also hold a PhD from such an institution), but have just recently arrived at the lab.
6) The "stars of the lab" (12%). Most joined in the first years, they know a lot of randomists and are members of the board of directors.

This clustering produces a comprehensive picture of the different groups of agents at J-PAL, who have different functions in the "randomization" phenomena. Some figure as leaders, gathering several types of capital, such as Esther Duflo or Abhijit Banerjee, both economists at MIT, who are in charge of the representation of the laboratory and, moreover, of the methodology itself. The prestige of their positions (almost 50% are in Position 1, 80% are working in a top university) translates into the method's legitimacy. With the help of the "catches," such as Amy Finkelstein and Roland Fryer, both Clark Medal laureates, they create an aura around randomization. The "young ambitious" and the "mid-careers" are those who push and give a lot of energy to the randomization movement, as they can directly benefit from the success of the RCT wave. They are helped by the "newbies," who have to prove their worth.

The co-existence of different groups, quite well-defined, reinforces the oppositions uncovered by the MCA, and highlights the heterogeneity of the lab. The members of J-PAL cannot be considered as equals, their differences going well beyond organization-specific positions such as sitting on the board of directors. This co-existence of different groups is crucial to the operation of the J-PAL, as the more prestige ones (cluster 5 and 6) can count on the less integrated ones (cluster 1 and 2) to take care of the more practical aspects of RCTs, and the latter can use the former to earn prestige.

3.   A Methodology under Control

In many cases, a research laboratory preferably affiliates members from the academic institution to which it is formally linked. This is not the case with J-PAL, as only 7.6% of its members are also at MIT (15.3% at Harvard). Even if the majority of J-PAL affiliates are based in the USA (71.8%), they are located at a range of universities, supporting J-PAL's preferred self-perception as a network of economists rather than a lab. In the following section we will further explore this hypothesis using network analysis.

3.1   A Network Analysis of the "Randomistas"

In order to show how J-PAL members are interwoven into the RCT movement, we included in the network all researchers who have done experiments and/or published with J-PAL members. If an economist runs a lot of experiments or publishes a lot on RCTs, he or she is more important in the field than someone who runs only one experiment, for example. Besides, RCTs are not run only by J-PAL members, even if it is the core of the randomization movement.

Two questions are addressed using this methodology. What is the connectivity[15] between researchers, do they know each other well and can the RCT movement be described as a "small world"? Can we identify leaders in this field of research, who can be defined as those who know more researchers than others and have more than average ties. We assume that these leaders are keepers of the methodology and the diffusion of its principles.

Method

Although J-PAL is highly recognized for its RCTs, not all RCTs are conducted with its participation. This is why ideally we need to work with all RCTs done in the field of economics. Unfortunately, no unified database on RCTs in economics exists, quite a few experiments are not published and even a unique terminology is lacking, making this task rather difficult. Hence, we will limit the study to the 689 experiments and 504 publications listed on the J-PAL website.[16] This guarantees the quality and homogeneity of the database, albeit at the cost of its exhaustiveness. J-PAL's experiment and paper databases are both easily accessible on the website and regularly updated. For each experiment, the names of participating researchers are recorded. The condition for an experiment or paper to be listed on the J-PAL website is that at least one researcher is a J-PAL affiliate. Of course, this database is not complete, as the RCTs

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[15] A graph is connected when there is a path between any two different points through one or more edges. Let's take the example of a network of four people, A, B, C, and D. If A knows B, B knows C, and C knows D, then this network is connected (every node can join every other node). But if on the one hand A knows B and on the other hand C knows D, the network is not connected. One says that there are two connected components.

[16] All the numbers used in this paper are as of December 1, 2015.

with no J-PAL researchers are not included. However, J-PAL affiliates cooperate a lot with non-J-PAL affiliates and there are many more non J-PAL members than J-PAL members in the database. We can also add that one more reason to focus on J-PAL is its central position in the field.

Two networks were constructed, one for experiments and one for publications. The networks are not similar, albeit in the research process the experiment network precedes the paper network. The co-experimenters' network is broader than the co-authors', because not all co-experimenters will be involved in writing papers. At the same time, one experiment may result in several papers. The co-authors' network provides us with information about the capacity of its members to publish, while the co-experimenters' network shows who is capable of initiating and engaging in projects. It should be remembered that there is a temporal gap, in years, between an experiment and the publication(s) arising from this experiment: The co-experimenters' network could also be understood as a proxy of the future co-authors' network.

In addition to establishing who has relations with whom we are also interested in the intensity of the relations. Here we not only look for connections of researchers through experiments or papers and the number of researchers each researcher is linked to in turn, but are also interested in the number of collaborations between them. Many researchers collaborate several times with the same colleague. So here we are interested in the intensity of the relationship between two people.

3.2 A Hierarchized Network with Few Leaders

Each researcher from the co-experimenters network knows five researchers on average. The average is similar in the co-authors' network (4.66). If multiple collaborations are taken into account, this degree of centrality rises to 6.5, which means that each researcher has 6.5 collaborations on average, possibly with the same researchers (6.36 for co-authors).

In the co-experimenters' network, there are 907 vertices, which means that it is not limited to the 131 researchers affiliated to J-PAL at the time the data was collected. This figure justifies our approach to start our database with the experiments and the publications listed on the J-PAL website, as it shows that they are not limited to J-PAL members. Our network analysis gives a good picture of the existence of interrelations between researchers who run RCTs, far beyond the J-PAL members. In the two kinds of networks studied (experiments and papers), edges between J-Pal members are by far the minority (14% for experiments, 20% for publications). This world network is highly connected, as there are only nine connected components, of which one contains 870 researchers (others contain seven vertices or less). As we can see in Graph 3 co-experimenters belong to a small world, where almost everyone is related.

The co-authors' networks encompassing 656 researchers of whom 131 are J-PAL affiliates are also of interest. So, many authors are not J-PAL affiliated. The number of researchers involved is lower than the co-experimenters' network and the network is also less connected. It consists of 13 components, with

the large one including 602 vertices. Nevertheless, we can also talk of a "small world" of co-authors.

**Graph 3:** The World Network of Co-Experimenters
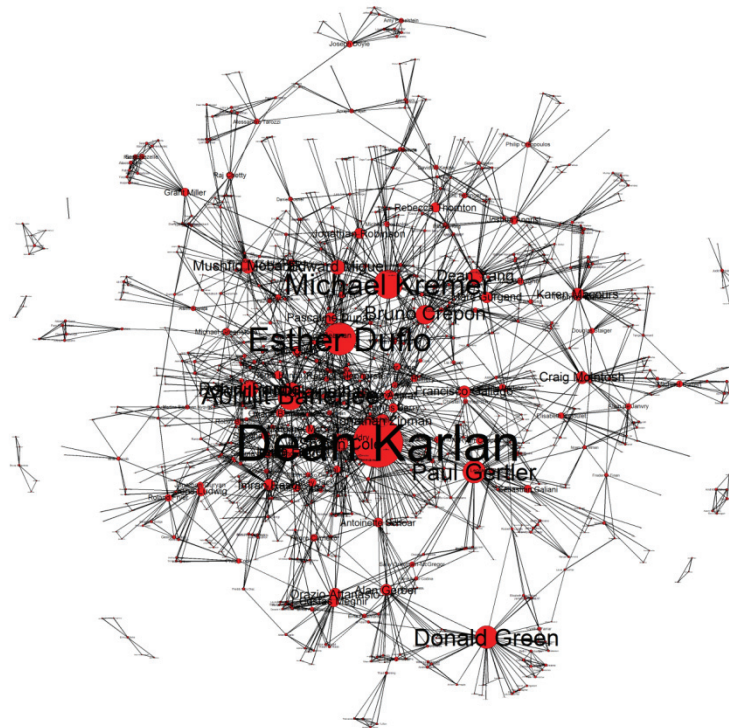
This high connectivity also involves a high intensity of relations. Researchers who are not related to others are scarce. This is an important point when explaining the diffusion of the methodology. In less connected networks with more connected components, it would be more difficult to keep the methodology consistent, since it would have many chances to evolve and to vary between subgroups. Here, a highly connected network works as a guarantee to keep methodological principles the same. In comparison with other methods' networks, regression discontinuity or differences in differences, both RCT networks reconstructed here are by far less chaotic in diffusion (Angrist and Pischke 2009). J-PAL's strength is to have kept randomization under control by having a tightened grid of researchers who use this method.

The main indicator to measure the importance of a researcher in the network is the degree of centrality, which counts how many edges start from a vertex. In an inter-knowledge approach, it is the number of researchers who he or she

knows. Graphically, the length of every vertex is a function of its degree of centrality.

In Graph 4 below, which ranks researchers by their degree of centrality, the line has a logarithmic form: the number of degrees rises slowly at the beginning and faster at the end. A total of 92.1% of researchers know less than 10 researchers and only 2.2% know more than 20.

Graph 4: Researchers Ranked by Their Degree of Centrality (Experiments)
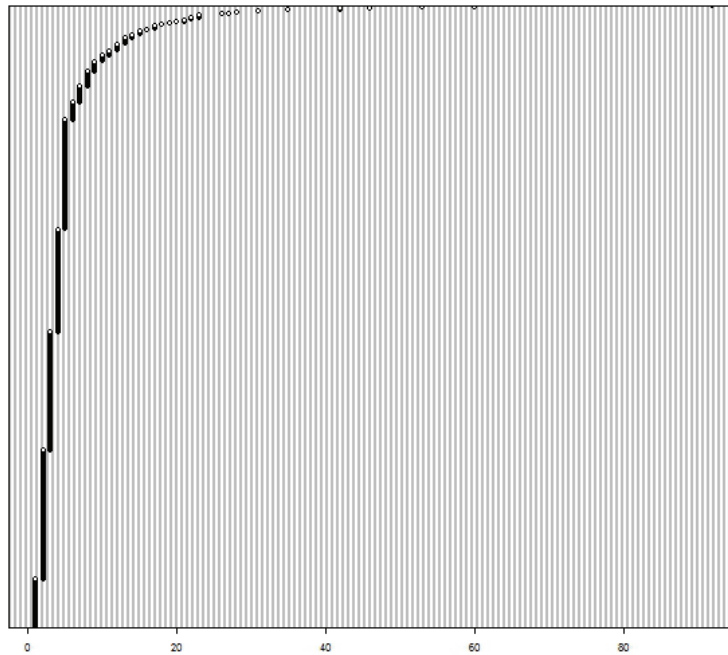
Dean Karlan has the highest centrality being linked to 92 researchers, followed by Esther Duflo (60). This gap is rather surprising since Duflo is perceived as being better known. Michael Kremer (54) and Abhijit Banerjee (49) follow in third and fourth place. These four researchers have been involved with RCT in development economics right from the start. Duflo and Banerjee founded J-PAL, Karlan created IPA and shortly afterwards joined J-PAL, and Kremer was one of the first economists, in the late 1990s, to randomize in poor countries.

The fifth position, held by Donald Green with 42 researchers, is interesting. Professor of Political Science at Columbia University, he became a member of J-PAL as recently as 2013, ten years after the lab was created. He works mainly on North America and used RCTs, already widely used in political science for some time, before his J-PAL affiliation. By recruiting researchers such as Donald Green, J-PAL extends its reach and possible areas of application and intervention.

Graph 5: The World Network of Co-Publishers
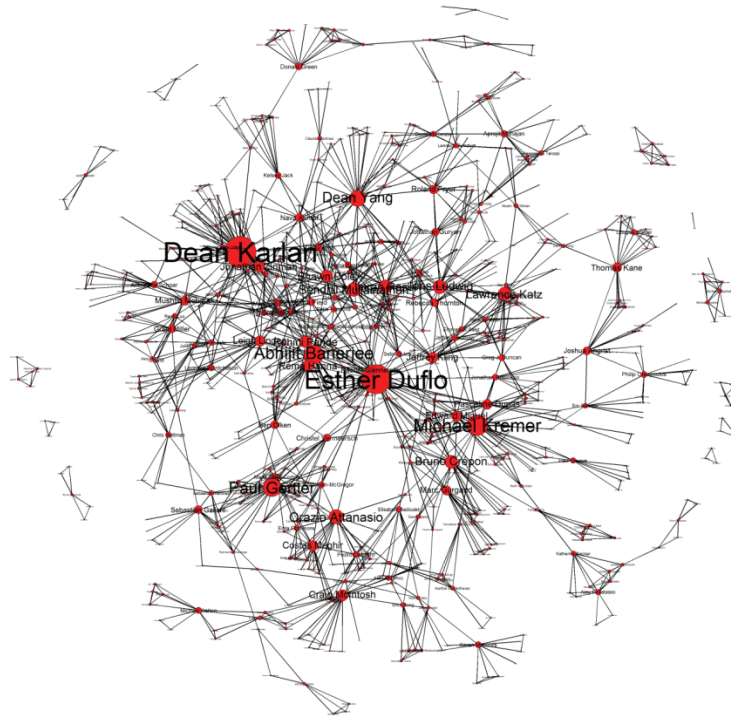
When taking into account the intensity of ties, some researchers like frequent collaborations more than others, such as Dean Karlan and Jonathan Zinman, who work on 29 RCTs together, or Abhijit Banerjee and Esther Duflo (19).

The results do not change to any considerable extent when the intensity of links is taken into account. The logarithmic form of the curve of the degree of centrality is even more important here, because of the multiple collaborations. A total of 88.2% of the researchers have 10 collaborations or fewer, and 4.9% have more than 20. Dean Karlan has 199 different collaborations, Esther Duflo 137, and Abhijit Banerjee 93.

Looking at publications (and not experiments), we can also clearly see the existence of leaders, albeit Dean Karlan is no longer the indisputable leader here. Having 50 co-authors, he is almost at the same level as Esther Duflo (47), both again being the leaders of RCT publications. When taking into account the intensity of links, Esther Duflo (128) replaces Dean Karlan (93) at the top.

Graph 6: Researchers Ranked by Their Degree of Centrality (Publications)
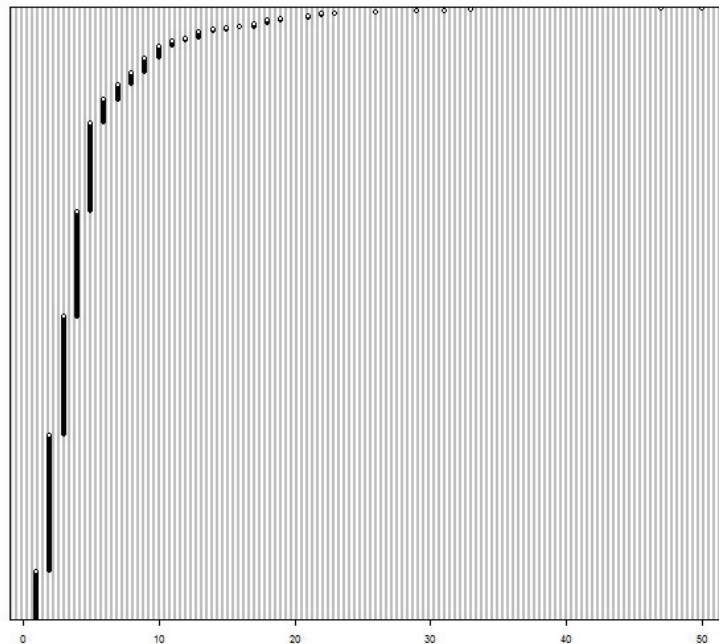
On an international scale, Esther Duflo and Dean Karlan appear to be inevitable leaders of experiments as well as publications in the RCTs paradigm. Each of the centrality curves analyzed has a logarithmic form, meaning that many researchers know few colleagues and few researchers know many colleagues. This can be explained by the "winner takes all" effect: the more a researcher participates in experiments, the more he or she is acquainted with other "randomistas," and the more he or she participates in experiments.

Concerning the diffusion of the RCT methodology, the fact that such strong leaders exist is important. These researchers could be seen as those who *hold together* the field of randomization. They are able to control the methodological principles through the experiments they run and the papers they write. Networks with the same mean of degree of centrality but a lower dispersion would not allow such a tight grip on the methodology as the co-experimenters' and co-authors' networks reconstructed here do. Researchers who are central in the network are most of the time also those who occupy powerful positions in J-PAL's organizational structure. All of them have high academic and professional capital (Jatteau 2018), which reinforces their positions in the networks. Indeed, they work with a lot of different researchers and moreover their professional positions allow them to generate a lot of prestige and power. Professional positions also influence their relationships to others: running an experiment

with Esther Duflo or writing a paper with Dean Karlan has the potential to have a high impact on careers, especially of junior researchers. In this way, adopting the RCT methodology could be seen as a pre-condition to engage in J-PAL's symbolic exchanges: a PhD candidate, who participated in an experiment, told me that a prominent J-PAL researcher will sign the paper with other researchers involved in the experiment, without having participated. But for the PhD candidate, it was a win-win deal: he and his colleagues were pleased to sign a paper with a famous economist, and this famous economist had one more published paper.

The structure of the network facilitates the diffusion and the unity of the method of randomization. Some researchers become, due to their position, sort of "methodology advisers," allowing them to collaborate with a lot of different colleagues and to "control" that RCTs are conducted in the "right" way. This network, with clearly defined leaders, encourages a strong homogeneity of the methodology.

4.   Conclusion

Our results reveal the elitism of the J-PAL and the tightened network of randomists as an explanation for the success of RCT. When looking at the degrees of J-PAL members and their professional positions, one sees an overrepresentation of top universities. This shows how selective the laboratory is in choosing its affiliates, and, at the same time, prestigious researchers (by degree and/or professional positions) are attracted to such an organization.

This elitism is powerful and has important effects in the field of economics, and particularly in the area of development economics. First, it gives legitimacy to the randomization, both inside and outside economics. Inside, because the positions occupied by randomists in academia reinforce the interest in the method and fosters further demand. Outside, because prestigious positions are symbolically flagged out, e.g. by prizes such as the Clark Medal, also known to people not familiar with the inner workings of the academic field (c.f. Maesse 2018, in this issue). Such is the power of elitism: if the "best" scholars are using and promoting a unified methodology, it has to be the best methodology.

Second, the concentration of educational capital and academic capital supports the production of (academic, financial, political) means to maintain the domination of randomization. Funding to run RCTs, professional positions in faculties, doctoral and post-doctoral grants, etc., are easier to gain for scholars with a high level of educational and professional capital, even more so when concentrated in an institution such as J-PAL.

Third, our network analysis was able to show the extension and the uniqueness of the RCT methodology. Indeed, RCTs have spread with the same methodological reflexes. In particular, the absence of qualitative methods is striking

(Morvant-Roux et al. 2014). The history and sociology of sciences show that, in the diffusion of methodologies, they are often modified, depending on where and by whom they are used. But in the case of RCTs, the stability over time and context is astonishing. The existence of "leaders" in experiments as well as in publications, defined by economists who have a lot of co-experimenters and/or co-authors, can explain the compactness of RCTs. With a high amount of academic and professional capital and due to central positions in the network, they are able to hold together the field of randomization, by spreading their own vision of the method in general.

These explanations of J-PAL's success do not claim to be the only ones. The others, stated in the introduction, may still be valid, but as we would like to argue, need to be complemented by insights from sociographical study. In order to explain the success of any methodology, we need to take a look at those who run it (Latour and Woolgar 1979; Lebaron 1997).

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