Post-bac admission: an algorithmically constrained "free choice"

Leila Frouillou

Abstract

The RAVEL sectorization system and the "free choice" Post-Bac Admission (APB) system which followed in 2009, are systems for assigning admission to undergraduate study [the "Licence"] in the Île-de-France administrative region[1] and can be defined as control tools. Grey literature and interviews with stakeholders and students (enrolled at Paris 1 Panthéon-Sorbonne and Paris 8 Vincennes-Saint-Denis) were used to get into the "black box", as it were, to explain the selection process the APB algorithm puts in place on the basis of geographic priorities (regional and then based on *académie*[2]), and lotteries in the event of greater demand than spaces available in "non-selective" university programs. The resulting inequalities in access can be felt and expressed by the students in terms of unfairness. The spatial dimension of these inequalities is more than just part of the internal functioning of the system; it is rife with implications in the priority granted to the baccalaureates from the *académie* (as previously in the RAVEL sectorization system). It draws more deeply on their educational socialization; students' degree of familiarity with these post-secondary guidance and enrolment procedures depends both on their social standing and their secondary school [lycée] (differences in guidance counselling, role of peer groups and collective orientations).

Key words: Post-Bac Admission, algorithm, inequalities in access, higher education, Île-de-France

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[1] Translator's note: France's most densely populated administrative region, comprising Paris and the surrounding area.

[2] An académie is essentially an educative division of french territory that may contain many universities . The Ile de France region contains three academies : Paris, Creteil (east) and Versailles (west).

This article[3] examines the spatial injustices produced by the educational assignment systems, starting with the particular case of university instruction in the Île-de-France administrative region. Due to the density of post-secondary programs and the number of students, since the early 1990s the region around the country's capital has developed an application for assigning students entering their first year of university in so-called "non-selective" programs, for which the requirement is simply having a "baccalauréat[4]". This application, called RAVEL [tr.: automated census of students' wishes] was replaced in the fall of 2009 by the national "Post-Bac Admission" system (APB), resulting in a reconfiguration of the rules for access to non-selective university programs in the Île-de-France administrative region. Focussing on these streams rather than on France's selective higher education programs (such as the "Sections de Technicien Supérieur" [senior technician] or STS, preparatory classes for admission to the "Grandes Écoles" or CPGE, or double degrees) makes it possible to show the inequalities in access produced by the assignment systems rather than selection based on individual student records as done by the institutions (lycées, schools and universities). The specific study of how the Post-Bac Admission algorithm functions in Île-de-France thus makes it more possible to show overall how the systems for assignment of student populations, as part of a predictive management of student behaviours, create inequalities that are particularly striking in their spatial dimension. This analysis is more broadly consistent with the perspective developed by Desrosières (2008a) around a sociology of statistics considered both as a tool of evidence and a tool for control. This is, then, a look inside (*Ibid.*, p.9) these algorithms as tools (for assignment in this case) in order to show how they "help the social world to perform" (*Ibid.*, p.8).

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[3] I wish to extend my warm thanks to the reviewers for their valuable advice in the preparation of this article.

[4] Translator's note: The "baccalauréat" or "bac", is received at the end of secondary school and is the main diploma required for pursuing university studies; it should not be confused with a bachelor's degree. Holders of the baccalauréat are referred to as "baccalaureates".

There is abundant literature studying the administrative function (Barrault 2011) and the segregating effects (Merle 2011; Oberti et al. 2012) of the French secondary education map, and which provides an analytical framework for reflecting on these assignment systems for admission to higher education. Thus, the 2007 reform, which promoted more flexibility in the school map for secondary school by making exemptions public and official, improves "free choice in education" (Oberti & Rivière 2015). This seems to correspond to the same dynamic as the transition from RAVEL to APB in the fall of 2009. This analogy focuses particularly on the proximity of the algorithms used in the secondary systems (Affelnet for admission to the lycée, expanded to all *académies* in 2008) and post-secondary systems (APB, expanded to all in 2009) (Hiller & Tercieux 2014). The various studies on Affelnet thus allow the in-depth examination of how the APB functions, particularly when questioning the possible unfairness of this system (*Ibid.*) or the social and educational impacts of separate priorities and bonuses based on *académie* (Fack et al. 2014). In Paris, for example, academic performance is weighted more heavily (600 points) in determining applicant priority than status as a scholarship holder (300 points) (Merle 2011; van Zanten & Obin 2010; Fack et al. 2014). In a more general way, research on the education map is a reminder that the map designates more than just the student sectorization and assignment system: it is a forecasting tool for the management of education resources which therefore also includes the location and number of schools (van Zanten & Obin 2010). This invites examination of the assignment systems – RAVEL and APB – with regard to the Île-de-France university landscape, particularly concerning access to universities offering programs that are perceived differently, i.e., ranked symbolically (Frouillou 2015a). Finally, this research on secondary education forms a key framework for understanding the strategies for avoiding institutions, and therefore getting around the assignment systems (Barthon & Oberti 2000; François & Poupeau 2005).

This article is based on a doctoral dissertation examining the socially differentiated breakdown of student populations among the sixteen public universities in the Île-de-France administrative district. The analysis of the assignment systems for

admission to higher education in that region is based on grey literature (guidance counselling handbooks, information documents produced by the *académies*, and websites devoted to these systems), interviews with guidance counselling services of the three Île-de-France *académies* (Paris, Créteil and Versailles), with a number of vice chancellors of the Paris universities as well as with the individuals responsible for the operation of these assignment systems (a telephone interview with the individual in charge of APB and an interview with regard to RAVEL, conducted in 2008 by B. Le Gall as part of his thesis in progress on the economics-management programs). The archives of the University chancelleries (archives of Vice Chancellor D. Vitry – 1993-1999, 1474W) as well as a media review (1985 to date) provided background information on the RAVEL tool. Finally, interviews focused on two universities in the Île-de-France district (Paris 1 Panthéon-Sorbonne and Paris 8 Vincennes-Saint-Denis) and three disciplines (Economic and Social Administration, Law, and Geography) made possible the analysis of the school and university trajectories of nearly 80 students (roughly half of which were interviewed a number of times), with regard to their social rank and their housing (see box). Discussions with the Training and Research Unit (UFR) management teams in these fields also made it possible to explain how the assignment systems function.

Methodology box on the survey of Paris 1 and Paris 8 students

This survey was conducted to complete preliminary work on student populations (and their distribution among the universities of the Île-de-France region) using SISE (Système d'Information sur le Suivi des Étudiants [tr.: Student Tracking Information System]) databases of the Ministry of Higher Education and Research (MESR), detailing for each administrative enrolment in the University the socio-professional classification of the student's referent parent, the type of baccalauréat the student has and age at which it was obtained, as well as the student's university situation (institution, discipline, level of studies). The interviews made it possible to work on the gaps in the average approximations forming the quantitative approaches by highlighting the variety of student trajectories in the Île-de-France university space.

In order to grasp the spatial aspect of these social and academic paths, various themes were addressed: education trajectory, the choice of a university, mobility and transportation, the relationship between studies and the place of study. The survey fields were chosen so that two large universities focussing on the humanities, social sciences, and law could be compared; the universities' names and locations also revealed tension between the city's centre and the periphery and finally, segregating mechanisms (separate *académies*, different institutional policies). The Paris 1 Panthéon-Sorbonne students and Paris 8 Vincennes-Saint-Denis students were contacted through the university portals, trips to the lecture halls, messages from professors, e-mail or by word-of-mouth among the individuals participating in the survey. Some Geography students were surveyed as part of a 2nd year master's degree research paper in 2011; they had gone through the RAVEL system but their program was not sectorized (Frouillou, 2011). In 2012, the survey disciplines were Economic and Social Administration (AES) and Law, two disciplines occupying opposite ends of the hierarchy of disciplines in France, the former recruiting more working-class students. Some 20 students in the 1st year of a master's degree program in 2012 were able to provide information about their going through RAVEL sectorization for these two programs at these two universities. About 40 1st year undergraduate students (L1), who went through the APB system, were interviewed in 2012 and the following two years. The geography students were surveyed again in 2014, with most of them then being enrolled in the 2nd year of a master's degree program (M2). In total, this survey is based on 148 interviews conducted with 78 students. The purpose of repeating the interviews was to get an understanding of the student trajectories and any inter-university mobility that may exist. The table below details the students' social background, using the categories as defined by France's Ministry of National Education. Through interviews, the bias of the method can be seen in the under-representation of disadvantaged students at Paris 8. The fact remains that the students surveyed have various profiles with regard to their social backgrounds, type of baccalauréat and where they live.

Table 1 : Social background of the 78 students surveyed

	disadvantaged	average	advantaged	very advantaged	Total
Paris 1 survey respondents	26% (10)**	24% (9)	11% (4)	39% (15)	38
Paris 8 survey respondents	23% (9)	33% (13)	23% (9)	23% (9)	40
Total Paris 1 in 2011*	25%	17%	12%	46%	16 897
Total Paris 8 in 2011*	58%	17%	8%	16%	2 251

* According to data from: MESR-DGSIP-DGRI-SIES, SISE. For Geography, Law and AES in 2011 (all levels).

** The number in parentheses indicates the number of individuals surveyed. Despite the low number, the calculation of percentages makes it possible to compare the profile of the individuals surveyed to overall student populations.
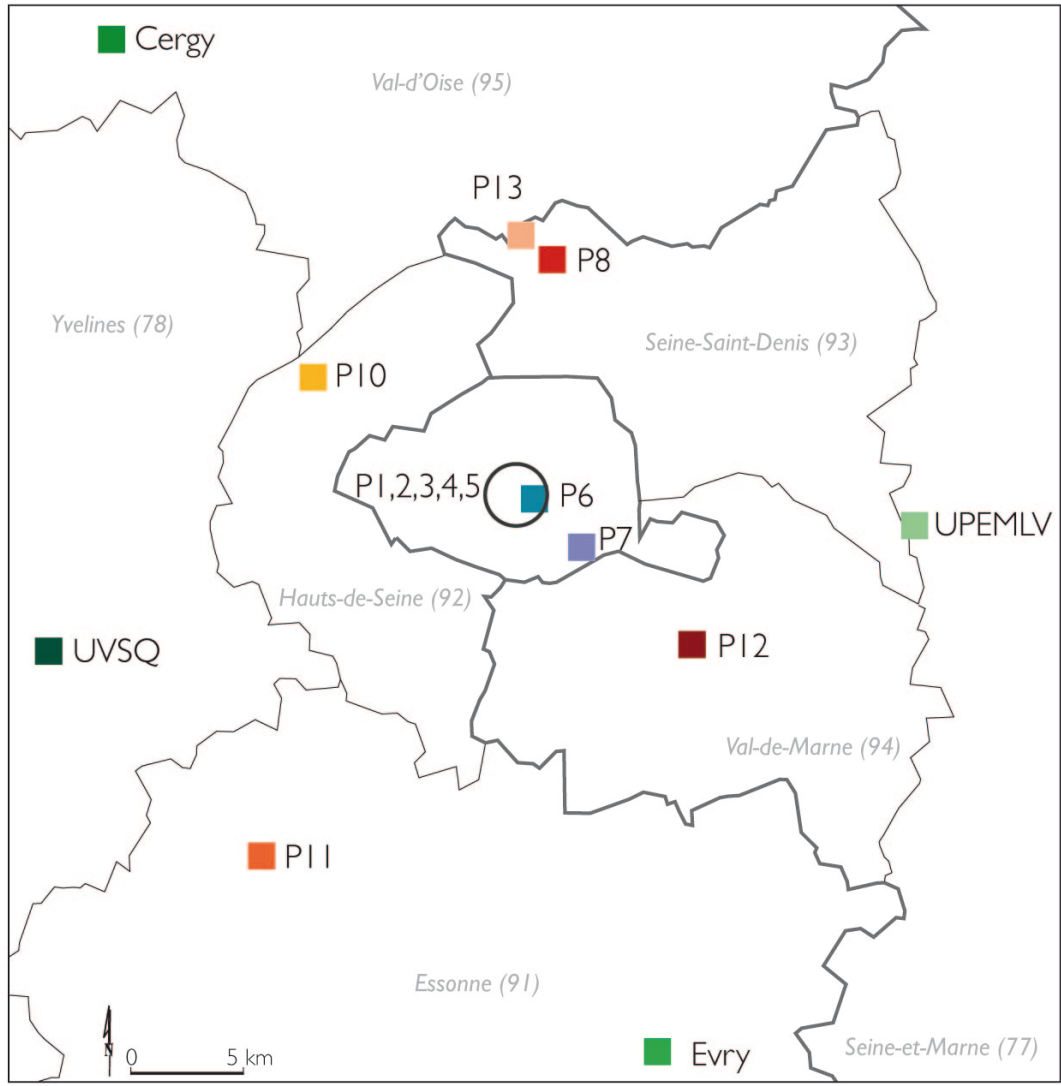
After presenting the organization of universities in the Île-de-France area and the background of the assignment system implementation, how the APB system functions will be examined to show how the determining of academic priorities and lotteries play a role in territory-based access inequalities. The last section of this article will show that the students' appropriation of the APB tool varies according to their social background and academic trajectory. These socially situated circumventions add to the access inequalities that are part of how the algorithm functions.

1. Introduction: RAVEL or how to manage "non-selective" 1st year (L1) entrance assignments in the Île-de-France region

The Île-de-France region currently has 16 public universities with enrolments of approximately 320,000 students. Beside four universities established in 1991 in Cergy, Évry, Marne-la-Vallée and Versailles as part of the U2000 national plan for developing the French university network, the universities in the Île-de-France region are, for the

most part, the result of the division of the University of Paris after the events of May 1968. As shown in Figure 1, these universities, numbered 1 to 13, have their head office located in Paris (Paris 1 to Paris 7, not counting Paris 9 Dauphine which has had the status of "*Grand*" institution since 2004), in the inner surburb (Paris 8 Vincennes-Saint-Denis, Paris 10 Nanterre, Paris 12 Créteil and Paris 13 Villetaneuse) or the outer suburb (Paris 11 Orsay).

Figure 1: Map showing the locations of the main sites of the 16 public universities in the Île-de-France region

Cergy

Val-d'Oise (95)

P13

P8

Yvelines (78)

Seine-Saint-Denis (93)

P10

P1,2,3,4,5 P6

UPEMLV

P7

Hauts-de-Seine (92)

UVSQ

P12

Val-de-Marne (94)

P11

Essonne (91)

0   5 km

Evry   *Seine-et-Marne (77)*

—— Departements ——— The 3 académies (i.e., districts) of Île-de-France

Paris académie

◯ Sorbonne and quartier Latin

Paris 1   Paris 3
Paris 2   Paris 4
           Paris 5

Other university sites in Paris

■ Jussieu (Paris 6)
■ Grands Moulins (Paris 7)

Créteil académie *(77, 93, 94)*

■ Saint-Denis (Paris 8)
■ Créteil (Paris 12)
■ Villetaneuse (Paris 13)

■ Cité Descartes, Marne-la-Vallée (UPEMLV)

Versailles académie *(78, 91, 92, 95)*

■ Nanterre (Paris 10)
■ Orsay (Paris 11)

■ Cergy-Pontoise
■ Evry
■ Versailles (UVSQ)

The density of this university landscape comes along with a complexity resulting from the dispersion of teaching and research centres (all these universities have multiple campuses) into three university districts (*académies*) (Paris, Créteil, Versailles). These 16 public universities represented 57% of the Île-de-France region students in 2011, this percentage having shrunk slightly over the 2000s (62% in 2001) to the benefit of the business schools in particular (data from PapESR, 2001 to 2011). In 2011, there were 60,000 first enrolments in the 1st year of undergraduate studies (L1) in the Île-de-France area. The so-called "non-selective" university programs run along side a great many programs to which admission is subject to selection, including to the university (double undergraduate degrees, university institutes of technology [IUT], professional degrees, etc.). Besides the public extra-university selective programs (STS, CPGE, *écoles*), the private sector in the Île-de-France region accounted for about 20% of the region's students in 2012. By way of example, in 2015 there were no fewer than 60 private STSs in Paris.

The diversity of programs and their modes of access ("non-selective" or "selective") associated with the density of higher education in the Île-de-France area makes the assignment of students particularly complex at the end of secondary school. This notably poses problems for certain so-called "non-selective" university programs, as they are open to all holders of a "bac" under the education code but are subject to too many applications for the number of spaces available. The pressure between the limited intake capacities in certain programs and the influx of secondary school graduates eligible to enrol thus involves establishing a selection process that is not carried out by the institution. Discussions with the individual in charge of RAVEL, the president of Paris 1 University in 1990, and the vice-chancellor at the time, as well as a media review, show that implementing the RAVEL system (Recensement Automatisé des Vœux des Élèves [tr.: automated census of student preference]) in 1987 was intended to forecast the flow of students toward these universities in the Île-de-France area. This system was therefore a response to the increase in the number of students during the 1980s, as was the creation of four additional

universities in 1991. Although the RAVEL initiative seemed to be attributable to the rectors, the presidents of the Île-de-France universities immediately approved it:

"In real terms, the rectors in the Île-de-France area were the ones who wanted [RAVEL put in place]. Why?... If things had been left as they were, it would have meant that all of Paris would collapse under the [number of] applications and you would've had universities forced to close their programs, quite simply because no one wanted to go there....That's why the three Île-de-France rectors, plus the vice-chancellor, in agreement with the 17 universities at the time decided to examine implementing sectorization...to guarantee a better distribution of students among the various universities." Interview conducted in 2008 by B. Le Gall with the individual in charge of the RAVEL system.

RAVEL was supposed to put an end to the annual flow of families and students who poured through the gates of Paris' universities upon the release of baccalauréat exam results. The interviews emphasize the media, therefore political, issue in the development of this computerized online pre-registration system. The first year that RAVEL was in place thus resulted in *Le Monde* journalists' amazement in Jussieu and Villetaneuse where registrations took place without the bustle of crowds[5]. This RAVEL pre-registration system for university became mandatory in 1990 and since then has sectorized the baccalaureates from the Île-de-France area in order to assign them to the various universities for the programs for which applications exceed the available spaces. The tentative progress of the early years led to the creation of a complex sectorization, proposing from one to three possible universities for each baccalaureate in the Île-de-France area. These institutions were proposed based on the program requested and the municipality where the student completed his or her baccalauréat. The recruitment sector boundaries for each university were specific to each of the more highly sought-after programs (i.e. 14 in 2008) and were the result of negotiations between the universities and university board of education offices

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[5] P. B., A. C., G. C., July 9, 1987. « Les inscriptions dans les universités parisiennes: ouverture en douceur », *Le Monde*. [Tr.: Parisian university registration: easy opening.]

(Frouillou, 2015a). The boundaries remained relatively stable between 1993 and 2008, the last year RAVEL was in operation.

We deem that RAVEL was an enrolment management tool for the programs with limited spaces. It can thus be defined as a control instrument, which makes it possible to deconstruct the neutrality often associated with management tools (including assignment algorithms): "tools of public action are not inert or simply available for socio-political mobilization; they have their own power" (Lascoumes 2004, p.8). This power is particularly for defining the parameters inherent to sectorization. "Starting in the 1970s, Bourdieu increasingly stressed the 'state' nature of government statistics, symbolized by the idea that the king (*rex)* is, etymologically, he who has the power to 'rule the borders' (*regere fines*), i.e. to impose" (Desrosières 2008b, p.298). The RAVEL system did in fact help to accentuate the recruitment gaps among the universities in the Île-de-France area (Cizeau and Le Gall, 2008). The RAVEL sectorization mapping shows that the number of institutions proposed by this system is on average greater in the capital. Moreover, research using SISE data from the MESR highlights the social and educational differences of the populations inhabiting the recruitment sectors of each university (Frouillou, 2015a).

Considering the symbolic hierarchy among the universities in the Île-de-France area, this sectorization system with variable geometry can be interpreted in terms of *inequalities* in access to the most prestigious centrally located institutions. The interviews conducted with the Paris 1 Panthéon-Sorbonne and Paris 8 Vincennes - Saint-Denis students who had gone through the RAVEL system testify to these barriers to university admission. For example, Léa was able to enrol in Geography at Paris 1 as this discipline was not subject to sectorization, unlike her friends from the Créteil *académie* lycées who wanted to get into programs subject to sectorization:

"They all wanted to come to Paris 1. I was the only one who was able to go off to Paris 1 because [Geography] was not sectorized....The others weren't entitled to! It's clearly a barrier, they couldn't come to Paris 1!... [My girlfriends] were disgusted when they saw that [the program they wanted] was sectorized and they couldn't come to the Sorbonne..." Léa, 3rd year undergraduate (L3) in Geography, Paris 1 2011. Father is

a taxi driver and her mother is a housewife, Montfermeil (93). Her baccalaureate is in Economics and Social Sciences

Without going into greater detail about this university sectorization, we deem that it determines differentiated accessibilities to universities based on the community where the student completed his or her baccalauréat, differences which constitute inequalities with regard to the ranking of the universities in the Île-de-France area (Frouillou, 2015b). Indeed, rankings upon leaving university are what make it possible to talk about inequalities, not just the differences when analyzing student trajectories: "the implicit reference, which makes it possible to speak of inequalities, and not just differences with regard to higher education, are generally the very unequal opportunities for entry to the workforce the studies offer" (Duru-Bellat 2014, p.150). What then is the impact of the new APB system on these inequalities in access to universities?

2. From territorial priorities to lotteries, algorithmic management of access to "non-selective" 1st year (L1) programs through post-bac admission (APB)

Implementation of RAVEL quickly showed the need to organize the distribution of students entering higher education in the Île-de-France area. This pre-enrolment system was extended to the selective programs, which had not been subject to any sectorization at all. At the start of the 2009 academic year, APB replaced RAVEL. The sub-directorate of equal opportunity and student life of the Higher Education and Workforce Entry Branch (DGESIP) of the Ministry of National Education provided supervision of this system. Project management was entrusted to a private not-for-profit association housed at the Institut national polytechnique de Toulouse.

This application was initially developed in the early 1990s to unify enrolment in the engineering schools (bac +2 years) entrance competition and allow the applicants to be distributed among these schools by combining the list of each applicant's ranked choices and his or her ranking in each school's entrance examination. The application was then extended to admission to the preparatory class in 2003. In 2008 (2009 for

the Île-de-France area), this system managed admissions to higher education at the national scale, including "non-selective" university programs. Eventually, the APB system should encompass "all individuals wishing to enter the first year of higher education in a program delivered by a French institution" (IGEN 2012, p.4). In 2011, the year of interest to us with regard to the student survey interviews, APB only managed the assignment of students who had received their baccalauréat that year or the previous year (those who were not already enrolled in 1st year or in an IUT after obtaining their baccalauréat) and were under 26 years of age. APB was thus a system initially developed for the selective programs and then extended to "non-selective" 1st year university programs.

Generalization of the enrolment procedure through APB fulfills the directions of the 2007 law pertaining to Freedoms and Responsibilities of Universities (LRU) and particularly the introduction of active guidance counselling (see Pistolesi 2015 for a detailed description of this system). By emphasizing the importance of freedom of enrolment, section L612-3 of the education code aligns this system with public policies valuing "free educational choice" at all levels of instruction:

"All applicants are free to enrol in the institution of their choice, subject to having requested pre-enrolment in advance enabling them to take advantage of the institution's information and guidance tool, which must be set up together with the lycées. If the applicant so desires, he or she must be able to be enrolled on the basis of the existing programs when enrolling in an institution having its head office in the jurisdiction of the *académie* where the applicant obtained his or her baccalauréat or the equivalent, or in the *académie* where he or she lives. When the number of applicants exceeds the number of spaces available at an institution according to the government authority, enrolments are decreed by the rector-chancellor upon notice from the president of this institution, in accordance with the regulations established by the minister responsible for higher education, on the basis of residence, the applicant's family situation, and his or her preferences."

This promotion of "free educational choice" for admission to higher education resulted in an opening of options of preferences expressed by each applicant for the

so-called "non-selective" university programs: while RAVEL only allowed a maximum of two choices (possibly three if the applicant was setting his sites on two disciplines), APB allowed 36 preferences to be entered, with a maximum of 12 per type of post-secondary program. The end of RAVEL's sectorization allowed baccalauréates to express preferences for any program at all, without restriction based on the community where they had earned their baccalauréat. This article of the education code is, moreover, essential for understanding how the algorithm for assigning students in the Ile-de-France area works: it makes the *académie* (where the baccalauréat was obtained or where the applicant resides) the reference point for determining the priority of certain applicants in the event of space shortages in a particular program.

According to a recent Inspection générale de l'Éducation nationale [tr.: general inspectorate of national education] (IGEN) report, 75% of general and technical baccalauréat holders entered post-secondary education through APB in 2012. Only 10% did not use this application. The others did not complete the procedure, did not receive a reply matching their preferences and/or rejected the final offer made to them. In 2011, the assignment procedure had three stages, at the end of which a complementary procedure allowed the assignment of baccalauréates who had not yet been accepted in their *académie.* For each application, the first stage consists of the applicant compiling a ranked list of preferences (36 possible in 2011), regardless of the type of program/institution (CPGE, IUT, STS, Licence, etc.). Here is an example of a list of preferences: 1st choice: CPGE at the lycée Louis-le-Grand; 2nd choice: 1st year Law at Paris 2 Assas; 3rd choice: Double degree in law and geography at Paris 1 Panthéon-Sorbonne, etc. Then at each of the three stages of enrolment, Post-Bac Admission (APB) offers the applicant pre-registration in the best possible program (taking into account the list of preferences the applicant submitted):

"the applicant…must reply within 72 hours in one of four ways: 'oui définitif' [final yes] (he fully accepts the offer); 'oui mais' [yes but] (he accepts the offer unless a higher ranked choice is ultimately offered, in which case he is no longer entitled to demand the first offer that was made to him); 'non mais' [no but] (he rejects the offer but keeps his application

open for higher ranked choices); 'démission générale' [general withdrawal of the application]. To the extent that the applicant is only proposed a single offer best matching his/her wish-list and that all the following choices on his/her list are essentially cancelled, the sorting of applications is a key issue in the procedure" (Orange 2012, p.124).

At the end of the three stages of the regular procedure, 93% of the applicants registered in APB have an offer of admission that matches one of their preferences (in 2013 according to an article in *Le Monde*[6], approximately 62% of French baccalauréates obtained their 1st choice, and 91% were offered one of their top five). But how does this application propose a program to each baccalaureate?

For each program applied for there is a sorting of applications produced by the institution when access to the program is selective (student record or entrance examination). The problem here is to generate a sorting system for the "non-selective" 1st year (L1) applicants that is not based on the applicant's record, as all baccalaureates have the right to enrol. As with the sectorization RAVEL used, a selection process is only established when the number of applicants exceeds the number of available spaces. APB will then apply an order of priority to all the applications in order to rank them. This order of priority has a specific feature in the Île-de-France area since a priority for baccalaureates from the region (over those from outside the area) was introduced. This specific feature stems from consultation among the ministry, the INP de Toulouse, the Vice Chancellery of the Universities of Paris and the 16 regional universities. As shown in Table 2, the Licences (undergraduate degrees) are classified into six categories according to their scarcity (category 3 at the regional scale for – and category 6 at the national scale) and according to the pressure arising from the number of spaces available and number of applications (categories 1 and 2). Because it pertains to all the categories of Licence except the fourth, this table shows the special characteristic on the scale of the [applicant's] home region in priorities determined by the system. For the so-called "non-selective" degrees (as opposed to those with "special admission procedures" in

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[6] N. Brafman, July 9, 2013, "[tr.] This year, over 61% of baccalaureates got their top choice", Le Monde.

category 4), pursuant to the article of the code cited above, the order of priority includes a smaller scale than the region: the *académie.*

Table 2: Licence categories and assignment rules

Categories	Licences affected	Order of priority in assigning applicants by APB
1	L1 usually having adequate spaces for baccalaureates from Île-de-France	1. Baccalaureates from the *académie* 2. Baccalaureates from Île-de-France 3. Baccalaureates outside Île-de-France 4. Others
2	L1 generally having inadequate numbers of spaces for baccalaureates from Île-de-France	
3	L1 only offered in one or two Île-de-France *académies*	1. Baccalaureates from Île-de-France 2. Baccalaureates outside Île-de-France 3. Others
4	L1 with special admission procedures (limited spaces)	Special admission rules for each institution (admission on school file, language test, examination, interview)
5	PACES – 1st year common to all studies in the health field (medicine, dentistry, pharmacy, midwifery)	1. Baccalaureates from Île-de-France
6	L1 with national recruitment	For baccalaureates from Île-de-France, same rules as for applicants applying for Category 3 L1 admission. Admission of non Île-de-France applicants is done on school record or lottery.

Sources: APB documentation and the IGEN report (2012)

By way of example, all undergraduate law and AES undergrad degrees are in Category 2, with the exception of those from Paris 13 Villetaneuse, Évry and Versailles universities.

For these Category 2 undergrad degrees where applicants exceed the number of spaces available, priority by *académie* (limited to the *académie* where the baccalauréat was obtained and not the *académie* of residence) occasionally does not filter out enough applicants. The APB must then apply even more restrictive priorities. At the outset, the online platform informs the applicants that they must state at least five more degree choices, including one in their home *académie*. Then, to select among the *académie*'s baccalaureates, the software program applies a series of three increasingly restrictive priorities.

The *académie*'s baccalaureates that have requested at least six choices for their L1 are first given priority ranking among all the baccalaureates from the *académie* that have applied for the program. In this way, a first group called G1 is formed. If this group still exceeds the number of available spaces, APB selects a still smaller group (G2): the baccalaureates from the *académie* who have stated six choices and who also placed this L1 program as their first choice. This is the first choice with regard to program. For example, a baccalaureate having applied for a CPGE as his first choice, then a double degree, then as third choice L1 in Law at Paris 1, has L1 Law at Paris 1 as first choice as the offer of an undergraduate non-selective program. This baccalaureate will therefore have priority over another baccalaureate from the académie for whom Paris 1 is second choice (e.g., 1st choice: L1 Law at Paris 5; 2nd choice: L1 Law at Paris 1; then 4 other non-selective L1 choices). If both restrictions (the six choices then the first relative choice) do not make it possible to form a group of applicants matching the number of spaces available in the program, a final restriction is implemented (creating a group called G3). The system then isolates the applicants that have requested this L1 program as absolute first choice (ranked first compared to all the choices expressed by the applicants, all programs blended).

The APB algorithm thus creates increasingly smaller priority groups of baccalaureates (based on a "Russian doll" principle). It then assigns the applicants of the group with the highest priority (G3). If the number of applicants in the G3 group exceeds the number of spaces available in the program, APB proceeds to a random draw in order not to exceed capacity. This is what happens, for example, in the highly sought-after

programs such as L1 in Law at Paris 1 (over 15,000 applications for approximately 500 spaces). If the assignment of the highest priority applicants leaves a few spaces available, the system proceeds to a lottery in the next group (G2, then G1, then baccalaureates from the *académie* then those from Île-de-France and then the others) until all the places have been filled. The way the algorithm functions thus creates a fictitious sorting of applicants to a program to which, according to the law, access is non-selective. This sorting arises from increasingly restrictive priorities, the first criterion being geographic (region then the *académie* where the baccalaureate was completed).

The matching of a list of ranked preferences and the number of spaces in each program makes APB similar to many systems managing the assignment of schools, like Affelnet, for example, (for entrance to lycée). For these systems, "the basic problem of the theory of matching is assigning the students to the school reconciling the parents' preferences with regard to said schools and the rules with regard to priority" (Hiller & Tercieux 2014, p.620). The complexity of the matching algorithms managing the assignments has bred significant mathematical literature since the foundational article by Gale and Shapley (1962), the definition of a single ideal match posing problems (Roth 1985). The research surrounding the theory of matching in an education context could be of interest to us to the extent in which it specifically questions the *fairness* of the proposed assignment. For example, Hiller and Tercieux (2014) consider four criteria in their evaluation of the Affelnet system: 1. Respect of the families' preferences (order of choices), 2. The fair assignment 3. Respect of priorities (for example, a student must not be disadvantaged by his good marks if they are used for determining priorities), and 4. The sincerity of the parents' choices (no strategy other than preference in the ordering of their choices, i.e. no calculation anticipating the chances of admission to certain institutions). The second criterion is defined as follows: "we call "unfair" a situation in which a student is not assigned to a school where other children, with lower priority rating are themselves assigned" (*Ibid.*, p. 621). From this perspective focussed on the algorithm, the fairness of systems like Affelnet or APB is interpreted in terms of respect for the order of

priorities. This internal criterion of justice is in no way related to the social issues at the core of the school assignment procedure.

A discussion of the definition of *fair* with regard to school assignment, which goes beyond simple compliance with algorithmic priorities, would lead to defining a general ranking with regard to the theories of social (and spatial) justice greatly exceeding the school issue at the heart of this research. I therefore propose here to consider justice with regard to the school experience of the students surveyed through their indignation or criticism toward the proposed assignment (Dubet 2014), and reserve the term *inequalities* for the objectivation of mechanisms for reproducing social ranking. The interviews thus allow the empirical grasping of spatial injustices, defined from a constructivist perspective and based on representations that social agents make of their university assignment.

3. Student appropriation of this instrument

The previous part shows that the APB system generates access differences based on territory (at the regional scale but also on the scale of the *académie*), which constitute inequalities if we bear in mind the symbolic rankings among Île-de-France universities. The matter now is to examine their unjust nature by studying the students' interpretation of this system, their interpretation of the rules on priority and lottery, and how they appropriate the system.

Incomprehension and frustrations: an unjust assignment?

A recent survey on parental reception of rejection of exemptions for middle school entrance [6ème] in Île-de-France reveals: "a strong sentiment of injustice…with an underlying profound incomprehension" (Oberti & Rivière 2015, p.229). Similarly, interviews with the students show incomprehension and frustrations tied to how the APB functions. Hamid, for example, questions the selection criteria, when the system, as we have seen, goes to a random draw:

"I had put Paris 8 as second choice. And I put Paris 1 as first. But I had to wait until the last session to come back here. Let me give you an example. I had a friend who had an ES profile

and who put his preferences in the same order as me and he wasn't accepted. It's not that he didn't have the same skills, it's just that, well...I'm not going to say that they use a certain number of quotas, but I don't see why I was taken while he was not." Hamid, L1 AES Paris 1 in 2012. His mother is at home and father is a team leader electrician. They live in Bobigny (92). His baccalauréat is in Science.

This type of incomprehension fosters the "selective" image associated with Parisian universities by a number of survey respondents, which borders on a feeling of injustice, if indeed not territorial discrimination:

"Maelys: As it is, when I arrived to speak to them [at the Paris 1 open house], they went straight to the point, asking if I was from Paris. As it is, if I had said no, they would have told me, 'Ah, well, it's going to be hard to get in.' While it isn't true!...They don't look at marks. Moreover, there are no marks in the faculty. So, they take us regardless of the part of the city we're from. And so they led us to believe that in order to discourage us. They told us that it was going to be impossible because we weren't from the *académie*." Maelys, L1 Law Paris 8, 2012, mother is a social assistant and her father is a manager. They live in Deuil-la-Barre (95). Her baccalauréat is ES

Here, too concerning entry into middle school following the loosening of the school map, we find the feeling of discrimination parents experienced. Some of this discrimination was deemed ethnic/racial but "also territorial, and the stigma associated with living in certain spaces" (Oberti & Rivière 2015, p.233).

APB enables students to express whatever choices they wish, including those that are, for all practical purposes, inaccessible considering the high demand for the programs and the priorities the system applies. Conversely, RAVEL was up-front with the applicants about the obstacle created by sectorization. The new assignment system thus creates frustrations, particularly in Law, where Parisian priority baccalaureates alone exceed the number of spaces available (in AES a few baccalaureates from other *académies* are randomly selected, like Hamid, to complete the capacities at Paris 1, the only of Paris' universities offering this program). The case of Victoire, who enrolled "by default" in Law at Paris 8, is representative of these gaps between the applicant's preferences and the actual chances of admission:

"I did not choose my university. I had taken...on APB you have to make a ranked list of choices based on our options. I had put Assas first and then the Sorbonne. And then Paris 8 third. And since I didn't get either Assas or the Sorbonne, well, I came to Paris 8...Personally, I had heard a lot of bad things about Paris 8, that weren't true, in fact. It's fine here. At first I didn't want to come here. I really didn't. I was, in fact, disappointed." Victoire, L1 Law, Paris 8 2012. Her mother is a skilled worker and her father drives a taxi. They live in Aulnay-Sous-Bois (93). Her baccalauréat is in Literature.

Investigation regarding potential selections made by the universities using APB, like the frustrations associated with inaccessible choices, can result in a feeling of injustice, like the criticism referred to above with regard to RAVEL's sectorization. But these spatial injustices at the core of the Île-de-France assignment system are just one component of the inequalities in access to higher education associated with baccalaureates' social position (always spatial).

Territorial inequalities are intensified by an unequal mastery of the APB procedure

There are certain measures to be taken in the APB procedure: there are steps and schedules to be followed; a minimum number of choices to fill in; creation of a ranked list. The latter step involves taking into account the importance of absolute first choices and relative first choices in the random draws in the event that applications exceed the number of spaces available: a student applying for a CPGE as his first choice and then L1 Law at Paris will not be in a priority position for the latter program. Thus, the APB system assumes that each individual applicant has a certain proficiency in abstract thought, complex and flexible ranking, depending on the higher education program, and that the applicant is able to plan over the more or less long term. These skills are unequally distributed according to the students' social position. The assessment of his or her chances for success in the three steps of the procedure is not obvious for all applicants. It may seem more reassuring to accept the first proposal made by the system without waiting for the next round to see if withdrawals might make it possible to ultimately get a higher choice. Familiarity with

the school space this list assumes, just as the fact that the familiarization process with the APB procedure takes place mainly in the lycée context for working class students (meetings with the teachers, discussions with peers, organized visits to institutions of higher learning and education fairs) underscores the importance of educational capital[7] in the learning and use of this algorithm which translates into the direction of educational assignment (François & Poupeau 2009) for entry to higher education.

The spatial aspect of these social inequalities in the appropriation of assignment systems can be interpreted through the enrolment of students in certain secondary institutions. On the one hand, as van Zanten (2015) recently showed using an in-depth survey of four lycées in the Paris region, guidance practices vary by school based on the social background of their students and whether the institution is public or private. It is thus observed that the guidance tools enabling the students to build their list of choices channel certain "choices" (selection of brochures; time granted to the various programs during information meetings; personalized interviews, if any, on plans to pursue studies; visits to education fairs or open houses). For example, personnel of lycées with disadvantaged student bodies first and foremost stress the procedural aspect of APB: "It is deemed important to take the students to the national 'APB' fair and more time is devoted to familiarizing them with this tool than with the content of their choices" (*Ibid.*, p. 89). On the other hand, the survey of students at Paris 1 and Paris 8 confirms "the eminently collective aspect of post-bac choices for a certain number of baccalaureates, mainly those whose parents did not have the experience of higher education" (Orange 2012, p.120). Indeed, a number of those surveyed from the same lycée in Val-d'Oise (Versailles *académie*) built their APB choice lists together in order to end up together in law at Paris 8 Vincennes-Saint-Denis: "We all decided to do law and be together in the same faculty…We talked about it somewhat among ourselves" (Cyril, L1 Law Paris 8 in 2012.

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[7]A component of cultural capital, educational capital can be defined as familiarity with the education system, which is closely connected to the experiences of family and friends and which may be in the form ofmeasured through educational qualifications (type of baccalauréat, for example) and the school path trajectory (possibly repeating years).

His father is a nurse and his mother is a nurse's aide. They live in Deuil-la-Barre (95). His baccalaureate is in Economics and Social Sciences). These two components (institutional differentiation and the role of peer groups) show the importance of the place of education in the greater or lesser degree of familiarity the students have with the complex "APB procedure". They also make it possible to examine the very principle of an assignment system that assumes that the individual applicants are rational stakeholders and strategists capable of producing ranked lists of choices that are appropriate for their "plan", as well as their chances of success in accessing the more or less selective programs (including the so-called "non-selective" programs).

The unequal abilities of the students in the eyes of the assignment algorithm, arising from both the educational conditions and the social position of these future students, are particularly legible in the strategies for circumventing the APB system. These strategies require resources that are even greater than the system is complicated, and they are always changing. Two types of strategies for beating the assignment systems are revealed by the survey. The first consists of choosing a hard to find option or selective program that requires a good school record. Other students seek appeals to enrol outside APB by directly applying to the UFR [Education and research units] offices where they wish to enrol. As the new director of the UFR of Law at Paris 1 Panthéon-Sorbonne explains in an interview, nearly 150 students were enrolled outside the APB procedure. His arrival greatly reduced these practices which mobilize major social capital (applications from teachers and celebrities, indeed, from the National Education administration and student unions). The spontaneous applications by students and their parents at the start of the year can still, however, result in an ad hoc basis enrolment (for example, this is the case for 15 applications in 2013-2014), after the usual withdrawals in the first weeks freed up some spaces. Now, these applications on appeal require some social and educational capital, like the school transcript filed by Agathe after she left the literature CPGE in which she was initially enrolled: "And the Sorbonne – I filed my transcript and my mother wrote them a letter explaining how desperate I was and that was that. So, I got an exemption and I jumped

at the opportunity." Agathe, L1 Law, Paris 1 2012. Her father is a head-hunter and her mother is a psychologist. They live in Châtillon (92). Her baccalauréat is in Literature.

These requests for exemptions require the applicants (or their family) to feel they have legitimate cause to call upon the education authorities. They moreover reflect socially differentiated writing practices; the chances of success for these requests for exemptions vary depending on the letter's tone and aim (Barrault 2009).

Thus, the *spatial injustices* revealed by students' experiences of the very functioning of the assignment algorithm (geographic priorities) are ultimately shown to be *social inequalities* bringing into play the lycées where the students are enrolled (different counselling tools, role of peer groups) as well as students' degree of familiarity with the administrative procedures, based on their academic capital and more generally, their social standing.

Conclusion

The APB algorithm makes it possible to manage the assignments for admission to programs that are nonetheless described as "non-selective" under the code of education. By doing this, it produces territory-based inequalities in access by giving priority (in a symbolically ranked offer of education) to baccalaureates from the region and then each of the three *académies*. The APB system then uses a lottery to place the applicants, unlike the Affelnet procedure, for example, which specifically assesses students' academic performance for admission to lycée in Paris. This ambivalence between selection inherent to the assignment process and access to "non-selective" streams makes it possible to examine the injustices felt by the students with regard to the administrative distribution of school populations.

Like other institutional mechanisms (construction and promotion of separate program offers, development of separate partnerships between secondary and post-secondary institutions, as well as university communication policies) (Frouillou, 2015a), the post-secondary assignment systems contribute to the social and academic differentiation of student populations among the universities in the Ile-de-France area. Given the central role of the education system in reproducing social

standings (Bourdieu & Passeron 1970), we can assume that these differences in access produced by the APB (and previously by the RAVEL sectorization) are ultimately social inequalities (particularly with regard to entry to the workforce), considering the symbolic ranking of the Ile-de-France universities. These inequalities are all the greater due to the fact that they are cumulative: the students with the most educational capital are the best placed to get around the assignment systems, indeed, to avoid certain lycées and thus anticipate the *académie* priorities affecting admission to University.

Despite the particular nature of the Ile-de-France case (high demand for certain programs, number of spaces, residential segregation), the way the APB functions in the capital region is a focal point for reflecting on educational assignment systems not only as algorithms but also as control tools. This algorithm is, in fact, an "all-purpose technical tool bearing a concrete conception of the relationship between the political and society, and supported by a theory of regulation" (Lascoumes 2004, p.6-7). The IGEN report on APB says the same thing, emphasizing that "implementation of this process for access to higher education brings social and economic issues and cannot be reduced to an 'administrative technique'" (IGEN 2012, p.4). One can therefore wonder about the relevance of the *académie* level in defining priorities for access to non-selective programs, particularly in the Île-de-France area where the transportation network into the city makes programs in Paris particularly accessible to baccalaureates from the Créteil and Versailles *académies*. Initially conceived for the *Grandes écoles*, this assignment system not only promotes a rational individual conception of students as strategists, but is more generally part of a classification (list of choices) perspective; this places institutions of higher learning education that are unequally endowed with various types of capital (particularly symbolic) into competition with each other. The transition from RAVEL to APB thus illustrates a certain concept of the role of the State (therefore of control tools), "the *neo-liberal State* which is supported on microeconomic dynamics, using an *incentive* system to possibly direct them and by accepting the main assumptions of the theory of rational anticipations (1980s). Benchmarking, i.e. the evaluation, classification and ranking of

performances, is a fundamental instrument thereof" (Desrosières 2008a, p.13). The computational reason at the core of the academic assignment systems thus helps to promote a "free choice" and a certain individual responsibility in one of the possible, if extremely limited, spaces based on students' social status and education pathtrajectory. More generally, we could wonder, according to M. Oberti and C. Rivière (2015), about the degree to which the frustrations and misunderstandings produced by the APB management tool, in driving an interpretation in terms of discrimination, can help to modify the students' relationship with meritocracy and republican equality.

Acronyms and Initialisms

AES: Administration Économique et Sociale [undergraduate program in France involving the study of law, economics, social sciences, business administration, applied mathematics, I.T. and one foreign language]

Affelnet: Affectation des élèves par le net [online assignment of students]

APB: Admission Post-Bac [Post-baccalaureate admission]

CPGE: Classe Préparatoire aux Grandes Écoles [preparatory class for the Grandes Écoles]

DGESIP: Direction générale pour l'enseignement supérieur et de l'insertion professionnelle [Department of higher education and integration into the workplace]

IGEN: Inspection générale de l'Éducation nationale [national education board]

IUT: Institut Universitaire de Technologie [university institute of technology]

MESR: Ministère de l'Enseignement Supérieur et de la Recherche [ministry of higher education and research]

RAVEL: Recensement Automatisé des Vœux des Élèves [automated census of student wishes]

SISE: Système d'Information sur le Suivi des Étudiants [student tracking information system]

STS: Section de Technicien Supérieur [senior technician section]

UFR: Unité de Formation et de Recherche [training and research unit]

About the author : **Leila Frouillou**, PhD in Geography - Paris 1 Panthéon-Sorbonne, UMR Géographie-cités

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