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Overcoming failure in higher education: Social inequalities and compensatory advantage in dropout patterns

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Abstract

The large proportion of dropout students from higher education has become a major concern in many industrialized countries. Despite consistent evidence of the association between social origin and dropout behaviour, it is unclear through which mechanisms social origin influences trajectories and educational outcomes in higher education, especially in countries with low financial costs for higher education studies. This study builds on the compensatory advantage mechanism to investigate the relationship between social origin, academic failure in higher education and dropout behaviour. Using a French longitudinal survey and event history analysis, results confirm that academic failure in the first year of higher education is a strong predictor of dropout, even after controlling for academic readiness for higher education. Supporting the compensatory advantage hypothesis, students from advantaged backgrounds are much less likely to drop out after academic failure than disadvantaged students and this result also holds for high-performing high school graduates. These results stress the importance of taking into account the interplay between social origin and academic performance during higher education to reduce dropout behaviour.

Keywords

Dropout, social inequality, higher education, compensatory advantage, France

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Introduction

On average among OECD countries, 32% of students who enter higher education drop out without any degree at this level (OECD, 2013). In the wake of Tinto's seminal work (1975), a long tradition of research has explored the predictors of students' dropout behaviour, but social inequalities have rarely been the focus of this literature (Chen and DesJardins, 2008). In contrast, the more recent interest of social stratification research for higher education has mainly focused on access or attainment patterns (for example, Boliver, 2011; Reimer and Pollak, 2010; Shavit et al., 2007; Triventi, 2013) and less is known on how social background influences students' progression within higher education. Following the identification of the waning effect of social origin over educational transitions (Mare, 1980), higher education has been seen as the most meritocratic segment of the educational system (Hout, 1989), either because of differential selection at the previous stages of the educational systems or because parental influence on educational outcomes should be smaller for adult students (Müller and Karle, 1993). Still, research in the U.S. (for example, Chen, 2012; Ishitani, 2006) or in European countries (for example, Contini et al., 2018; Gury, 2011; Johnes and McNabb, 2004; Ortiz and Dehon, 2013) has consistently found an association between social origin and dropout behaviour in higher education.

The present article aims to contribute to the understanding of social inequalities in higher education by studying the heterogeneous effects of performance in higher education on dropout behaviours, depending on social origin. It builds on the compensatory advantage theory which predicts that children from advantaged families are better protected from the consequences of negative life or educational events (Bernardi, 2014). The compensatory advantage theory has been tested in various school systems but its relevance for higher education outcomes remains largely unknown. In order to progress and eventually graduate from a higher education programme, students need to validate a set of courses which, in many countries, are defined for every year or semester of study. Failing to meet these academic requirements often limits progression within the programme of study. The present study thus investigates how students' trajectories diverge after early academic failure in higher education, depending on social origin. Contrary to most of the empirical literature which defines dropout as leaving a specific programme or tertiary institution, this article deals with higher education dropout in its stricter definition, which refers to students who have left higher education without having graduated from any degree at this level. Using longitudinal data on students in French higher education, this study aims to answer two questions: First, what is the association between social origin, students' academic readiness¹, early academic outcomes in higher education, and dropout patterns? Second, is there evidence of heterogeneous effects of early academic performance in higher education, depending on social background, as predicted by the compensatory advantage mechanism?

The compensatory advantage mechanism

The compensatory advantage (CA) model posits that socially advantaged individuals are less affected by prior negative events than disadvantaged ones; a mechanism which contributes to increasingly

divergent trajectories over time by social origin (Bernardi, 2014). In the field of educational inequalities, the CA hypothesis predicts that a negative outcome will lead to worse later outcomes for disadvantaged children than for children from socially advantaged backgrounds. Building mainly on the social stratification literature, there are three main theoretical arguments which could explain why tertiary students react differently to academic failure based on their social background: the relative risk aversion, the mobilization of parental resources and difference in responsiveness to ability information.

First, the relative risk aversion model (Breen and Goldthorpe, 1997) implies that, in order to avoid social demotion, socially advantaged students have a higher incentive to complete any educational level than disadvantaged students. Independently of academic performance, persistence in higher education is thus expected to be greater for upper class students. Second, the CA literature has stressed the importance of financial and cultural resources that socially advantaged parents can mobilize to compensate for a negative educational outcome. Most of the CA literature has focused on younger students and discuss parental investments during secondary education such as private lessons, parental help with homework or school choice (Bernardi and Grätz, 2015). But parental resources may also be mobilized at the higher education level, especially in case of academic difficulty. The literature on higher education has long highlighted financial barriers (for example, Goldrick-Rab, 2016; Kane, 1995) and more recently information biases (Abbiati and Barone, 2017; Usher, 2005) as drivers of social inequalities in higher education and it is possible that such barriers faced by disadvantaged students become even more salient in case of academic failure. In case of academic failure, it may become necessary to activate, for example, additional information to re-orientate, find additional funds to pay for an extra year of education or to invest in private tutoring. Finally, disadvantaged students may be more responsive to negative signals on their academic performance, compared to students from socially advantaged backgrounds. Empirical evidence has recently shown that the effect of ability signals, such as GPA, is stronger for low-SES students than for high-SES student for enrolment decisions in high school (Holm et al., 2019). In higher education, it was estimated that the information that students receive about their academic performance through grades explains 45% of dropout in the first and second year of higher education in the U.S. (Stinebrickner and Stinebrickner, 2014).

Whether it is driven by relative risk aversion, the mobilization of family resources, or responsiveness to ability information, I thus expect academic failure in the beginning of higher education studies to have a larger negative impact on dropout for disadvantaged students than for students from advantaged backgrounds.

Literature review

Social origin and dropout in higher education

Empirical evidence has consistently highlighted an association between social origin and dropout behaviour in higher education. This association has been found both in countries with high tuition fees like the U.S. (Chen, 2012; Ishitani, 2006), the U.K. (Johnes and McNabb, 2004; Smith and Naylor, 2001; Vignoles and Powdthavee, 2009) and in countries where the cost of higher education is much lower, such as Italy (Aina, 2013; Contini et al., 2018), France (Gury, 2011) or the French-community of Belgium (Ortiz and Dehon, 2013). As expected, academic performance, both in high school and in

higher education are found to be positively associated with students' persistence in and graduation from higher education, and negatively associated with dropout (Arulampalam et al., 2005; DesJardins et al., 2006; Gury, 2011; Johnes and McNabb, 2004; Ortiz and Dehon, 2013). Still, the large association between social class and academic performance in higher education appears to be partially, mediated by performance in secondary education (Hansen and Mastekaasa, 2006).

Inequalities in students' progression in French higher education

A number of studies have investigated the effects of individual students' characteristics and contextual factors on students' failure, success or attainment in French higher education (for an overview see Duguet et al., 2016). Results have consistently highlighted the importance of academic readiness, measured by performance in secondary education, on further success in higher education (Gury, 2011; Morlaix and Suchaut, 2014). However, there is no consensus regarding the net effect of social background, once controlled for differences in performance in secondary education. While some authors have concluded that social origin plays a small or negligible role in students' success in higher education (Brinbaum et al., 2018; Duguet et al., 2016; Férouz, 2000), others have found that social origin has a significant net effect on the probability of dropout (Gury, 2011) or on the probability of staying enrolled in higher education (Jaoul-Grammare and Nakhili, 2010). With a few exceptions, most of these studies have focused exclusively on predictors of success in bachelor's programmes in universities but much less in known on students' progression in other types of higher education programmes. In addition, the connection between academic failure in the first year of higher education and dropout behaviour remains largely unknown.

The French higher education system

Graduation from high school (in any track) is the main pathway to gain eligibility to higher education in France. After high school graduation, students can choose between three broad types of programmes which all belong to higher education: short and professional programmes, academic programmes in universities, and programmes preparing for admission to prestigious institutions. Short vocational programmes typically grant a degree after two years of postsecondary studies. Students need to apply to these programmes and are selected mainly based on their secondary school records. Bachelor's programmes are offered in universities and, until 2019, only required a high school diploma to register, without any selection. In case of successful progression, students are awarded a bachelor's degree after three years of studies. Finally, prestigious programmes preparing for admission to "grandes écoles" last two years. There is an initial selection and students must have excellent secondary grades to gain access to these prestigious programmes. After these two years of preparatory programmes, students take a competitive examination to gain access to one of the prestigious "grandes écoles".

French tertiary institutions rely heavily on public funding with only 12% contributed by students and families (OECD, 2017). With some exceptions, tuition fees are set at the national level and remains low (less than €200 a year for a bachelor's programme). The French higher education system is also characterised by a large need-based grant programme. This grant scheme is organised with different levels of grants ranging from fee-waivers to cash allowances to cover living costs. They are awarded on a yearly basis for a maximum of seven years of postsecondary studies. The scope of this grant

scheme is large: in 2017, almost 40% of all students in French higher education benefited from it (Eurydice, 2017).

It is important to highlight that the benefits in the labour-market associated with a higher education degree, and thus the incentives to complete a tertiary degree, are especially large in France. In terms of employment rates, there is a 13 percentage points (p.p.) gap between young adults with a tertiary degree and high school graduates, in favour of the former; one of the largest gaps among industrialized countries. In terms of earnings, workers with an higher education degree in France earn 54% more, on average, than workers with only a high school diploma (OECD, 2017).

Given these institutional features, France is an interesting case to contribute to the literature on dropout in higher education, which has been overwhelmingly focused on the American system. Like in the U.S., there are large economic incentives for individuals to invest in higher education. However, higher education is organised very differently with lower financial barriers and with a stratified system that combines very selective and non-selective institutions. The scarce comparative evidence on dropout seems to indicate that dropout from higher education is less frequent in France than in many countries; 20% compared to 30% on average among OECD countries (OECD, 2013). The French case thus offers the opportunity to identify to what extent, and how, social origin influences trajectories and educational outcomes in higher education systems where initial access barriers are relatively low.

Methodological approach

Event history analysis allows to analyse the occurrence and timing of events and to deal with censored information which occurs when information is missing because of a limited observation period (Yamaguchi, 1991). In the case of students' dropout, transition from enrolment to non-enrolment is identified as the event of interest and an individual must be enrolled in an educational programme in time t to be considered at risk of experiencing dropout. However, if we define dropout as leaving higher education without any degree, students who have graduated cannot experience dropout anymore and thus leave the risk set. Several authors have stressed that applying single-outcome models for correlated outcomes may bring misleading results (Allison, 1984; DesJardins et al., 2002; Scott and Kennedy, 2005) and that "all nonignorable ways of leaving the risk set must be treated as outcomes of interest" (Scott and Kennedy, 2005). I further apply a discrete-time method because enrolment and graduation can only occur at specific points in time, making the academic year a relevant time unit.

This approach uses multinomial logistic analyses to model the impact of different predictors on the hazard of the competing events of interest, graduation and dropout. In the case of competing risks, the hazard refers to the conditional probability that an individual experiences one of the competing events, given that he or she has not experienced *any of the competing events* before (Scott and Kennedy, 2005). Formally, the hazards are estimated with the following multinomial logistic model:

$$\text{Logit} \left[\frac{h_i(k, t)}{h_i(0, t)} \right] = (\alpha_{k1}D_{i1} + \dots + \alpha_{kJ}D_{iJ}) + (\beta_{k1}X_{i1} + \dots + \beta_{kJ}X_{iJ})$$

where outcome k ranges from 1 to K , time j ranges from 1 to J , and $h_i(k, t)$ is the hazard for subject i to experience outcome k at time j . $[D_{i1}, \dots, D_{iJ}]$ are time dummies and each parameter α represents the level of hazard for each time period for the baseline group. $[X_{i1}, \dots, X_{iJ}]$ are the set of substantive predictors and each slope parameter β gives the effect of the predictor on the value of the logit hazard. Descriptive measures such as hazard profiles and cumulative probabilities are computed using the formulas described by Scott and Kennedy (2005).

The data is set in the person-period format where, for each time period, three events are possible: dropout of higher education, graduation, and the non-event which, in most cases, refers to re-enrolment without graduation. In order to explore the patterns of dropout by social origin, I first discuss the descriptive hazards and cumulative probabilities for the outcome dropout. In a second step, I estimate the association between social origin, academic performance and dropout and graduation through the discrete-time hazard model. Finally, I add in this model an interaction term between social origin and academic performance in the first year of higher education and discuss the contrast of predicted hazards of dropping out by social origin and academic performance².

Data description

The analysis draws upon the survey “Enquête sur le devenir des bacheliers - 2008-2012” (SIES, 2012) which collected detailed information on a representative sample of students who graduated from high school in 2008 and were followed for up to five years. Students were interrogated via post mail or through a web platform (and phone interviews in case of non-response). Data on their high school performance and social class come from administrative sources (namely from the national pupil database “BEA” and from the national database on school examinations “OCEAN”).

The main outcome of interest is dropout, which is defined as leaving higher education without any degree for two consecutive years. However, since enrolment data is available for five years, dropout in the fourth year is defined by non-enrolment for one year only³. Following this definition, students who change programme or stop temporarily their study (for less than two years) are not classified as dropping out but fall in the “non-event” category.

In order to estimate the total association between social origin and dropout behaviour, the indicators of parental education and parental class are combined to estimate the total effect of social origin. I focus on the presence or absence of two key “resources” in the household: having at least one tertiary-educated parent and having at least one parent in the salariat. For the sake of parsimony, the results are only discussed for the two extreme categories (“no higher education and no salariat” and “at least one higher education and one salariat”) which account for the largest share of high school graduates (close to 80% of the sample as shown in Table 1 below).

Three indicators of high school performance are used to capture students’ level of academic preparation. First, the track of the high school diploma (academic, technological, or vocational) which all grant formal access to any programme in higher education but differ greatly in how they prepare students for it. Broadly speaking, the academic track is the best preparation for academic higher education (university or prestigious programmes), the technological track typically prepares for short cycle vocational tertiary programmes, and the vocational track most often leads to labour market entry. In addition, students’ performance is measured with their age at high school graduation and with the distinction obtained in the national and standardized high school examination. The variable

on the distinction identifies three levels of performance: students who obtained below average grades in the written examinations and got their degree by compensating with oral examinations a few weeks later (second session), students who obtained at least 10/20 in the written examinations (pass) and students who obtained an average of at least 12/20 in the written examinations (with distinction).

Academic progression in French higher education remains relatively structured. Each year in postsecondary education is typically organised in two semesters for which students need to validate a core set of courses. Students usually need to reach the pass mark for each semester to be allowed to register in the subsequent year, and if they fail to do so, are not allowed to register for the following year of the programme and must repeat the year. As an indicator of early academic outcome in higher education, I thus use a dichotomous variable which indicates whether a student met the first-year academic requirements and was allowed to enrol in the second year of the programme, or whether he or she failed to meet these requirements. Since the information on the academic outcome in higher education was only collected in 2009, i.e., in the first year following students' graduation from high school, the analysis is limited to students who enrolled in higher education immediately after high school graduation. In France, however, only a small minority of students delay their entry into higher education: In this sample, 92% of students who entered higher education did so immediately after high school graduation⁴.

Information on the type of programme followed by students in this first year, which broadly proxy different types of learning environment, is also included. Professional programmes which offer relatively small or moderately sized class environments; bachelor's programmes which often welcome very large cohorts of students; and prestigious programmes (CPGE or "grande école") which are characterised by small class sizes and tight social and learning communities. As a robustness check, the analyses are also replicated separately for each type of programme and discussed below.

In the overall sample, 7 607 students entered higher education immediately after high school graduation. The analytical sample refers to 5 590 students with complete trajectories and data on all independent variables. Almost all of the excluded cases come from missing data on the outcome variable (25% of the overall sample). Exploratory analyses show that higher education careers are more often incomplete for students with the weaker academic profile in high school. Since these students are also more at risk of dropping out (Gury, 2011), the results presented below are expected to underestimate the incidence of dropout in France. However, there is only a modest difference in the prevalence of missing information by social origin: 26% among the most disadvantaged social group vs 22% for the most advantaged one. Importantly, among students who experience failure in the first year of higher education, the proportion of missing cases is similar across social groups.

As can be seen from Table 1, failure in the first year of higher education is not a rare event: one student out of four experiences it. It should also be noted that the occurrence of failure is similar across social groups.

Table 1

Information on dropout and graduation is available for the first four years of postsecondary education but many students are expected to graduate later⁵. Thus, graduation hazard is modelled in the following analyses only to estimate correctly the risk of dropout but is not directly interpreted.

Results

Hazards and cumulative probabilities of dropout

The hazard of dropout ranges from 4.3% in the first year to 7% in the third year, translating into a cumulative probability of dropout of 16.2% after four years (Table 2). These are lower hazards than dropout estimates from other national contexts, but it is important to remember that, in many cases, studies rely on data from one specific university and thus estimate institutional dropout (leaving one specific institution without accounting for transfer), which is likely to be much larger than higher education dropout. An interesting result from the hazard profile of dropout in France is that, contrary to what is usually thought, dropout does not happen mainly in the first year of higher education.

Table 2

To explore the compensatory advantage hypothesis, it is possible to plot the social gap between the cumulative probabilities of students who failed to meet the academic requirements in the first year versus those who passed. As shown in Figure 1, the influence of social background is indeed much larger for students failing their first year: almost one of two disadvantaged students have dropped out by the fourth year while this is the case of only 15.7% of advantaged students, i.e. a gap of 33 p.p. by social background. In case of success, however, there is only a 10 p.p. gap in cumulative probabilities, based on social background.

Figure 1

What is the relationship between social origin, academic performance, and the risk of dropout?

The results of the discrete-time competitive-risks event history analysis, for the dropout outcome, are presented in Table 3. Model 1 provides an estimation of the total effect of social origin on the hazard of dropout in each year of higher education in France. Not controlling for any indicators of students' academic performance, the total association between social background and students' dropout behaviour is very large: there is 7.4 p.p. difference in the annual hazard of leaving higher education without a degree. Since the annual hazard of dropout is relatively low in France (between 4% and 7%), the estimated total effect of social background is substantial. The second model includes variables which control for students' academic preparation. The track of the high school diploma has the largest effect on the hazard of dropout, which is consistent with prior research (Gury, 2011). However, despite the importance of academic readiness indicators on dropout patterns, I find a net effect of social origin which is still sizeable: controlling for indicators of academic readiness, students from a disadvantaged background have a hazard of dropping out that is 3.2 p.p. higher, every year, than students from the most advantaged families.

Table 3

Finally, Model 3 includes the indicators of early outcomes in higher education. Failing to meet academic requirements in the first year of higher education has a large impact on the hazard of experiencing dropout, even when controlling for students' academic preparation in high school. On average, the hazard of dropout is 7.7 p.p. higher every year for students who fail to meet academic requirements in the first year. This is the largest effect in absolute terms, after the effect of the high school vocational track. This result highlights that early academic outcomes in higher education may have a large impact on dropout patterns, independently of students' academic readiness for higher education. Finally, and independently of academic performance, being first enrolled in a prestigious selective programme appears to reduce the hazard of dropping out by 1.6 p.p. every year. This finding is not surprising, as students in these programmes are expected to be positively selected on a number of unobserved variables that affect dropout, such as educational aspirations, and because these programmes offer transfer pathways towards university programmes in case of failure.

Does the effect of early academic failure on dropout vary by social background?

The compensatory advantage hypothesis predicts that the consequences of a negative educational outcome, such as failing to meet academic requirements in the first year of higher education, will be larger for disadvantaged students and that the influence of social origin will be smaller for students succeeding in their first year. In order to test this hypothesis, an interaction term between the academic outcome in the first year and parental education is included. Table 4 presents the change in the predicted hazard of dropout associated with being from the most advantaged background, versus the most disadvantaged one, by the academic outcome of the first year in higher education.

Table 4

Not controlling for students' academic readiness for higher education, being from an advantaged background annually decreases the hazard of dropout by 13.5 p.p. for students who fail in their first year (Model 4). Supporting the compensatory advantage hypothesis, the social origin advantage is much smaller (4.5 p.p.) for students succeeding in their first year. Results from Model 5 show that controlling for academic readiness does largely reduce the advantage of students from advantaged social backgrounds, but the evidence of a compensatory advantage remains large. Social background only has a small (1.7 p.p.) effect on dropout hazard for students who meet academic requirements in the first year of higher education, net of academic readiness. Conversely, for students failing in the first year, the difference due to social origin is estimated to be 6.5 p.p. every year. Again, given that the baseline of dropout hazard in French higher education is low, the social origin advantage, in case of failure and controlling for academic readiness, can be considered as a large one. Finally, controlling additionally for the broad three categories of programme (professional, university or prestigious) in which students were enrolled in their first year (Model 6), does not change substantially the patterns of the compensatory advantage.

Robustness checks

Academic failure in the first year of higher education does not occur at random and one can hardly argue that early failure is exogenous to dropout: students who fail in the first year of higher education are expected to differ from those who pass in many observed and non-observed traits and some of these traits are likely to be associated with dropout behaviour. My estimations of the compensatory advantage can thus be biased if the traits associated with both failure and dropout are

unevenly distributed across social groups. Biases induced by selection on unobserved variables, typically cognitive or non-cognitive skills and anticipated choices, are a typical problem in research on compensatory advantage (Bernardi, 2012) and it is important to identify how this may affect the present results.

The first obvious characteristic which may lead to both academic failure and dropout in higher education refers to lower academic ability. I argue that I was able to control relatively well for ability differences by including variables for high school track, age at graduation and distinction. The indicators of academic ability and readiness for higher education are measured only one year before academic failure, come from administrative sources, and are comparable across students as they are based on curricula and examinations which are nationally standardised. However, I am not controlling for non-cognitive skills nor for anticipated choices. There are a number of non-cognitive skills that may be relevant to success in higher education: perseverance, critical thinking, autonomy, motivation etc. If socially advantaged students perform better on these non-cognitive skills (for example, because we expect family background to be crucial for their transmission), then the estimates of the compensatory effect would be upwardly biased. On the other hand, one can argue that high school graduates coming from disadvantaged backgrounds are likely to be positively selected on some of these non-cognitive traits compared to their upper-class peers because of differential selection during the school career: since graduating from high school is much more common among upper-class students, those from lower backgrounds who reach this level and enrol directly in higher education can be expected to perform better on a number of non-observable skills. In this case, the estimated social gap in dropout after academic failure would be underestimated. Finally, one can expect that some students fail their first year of higher education because they have already decided that they want to stop their studies. If such anticipatory decisions are more common among first-generation college students, then the estimates of the compensatory advantage after failure are again upwardly biased.

In order to check whether the evidence of the compensatory advantage found after failure in higher education is robust, despite these possible biases, two strategies are implemented. First, I distinguish between students who fail their first year because they failed in the examinations, from those who withdraw before the end of the academic year, in order to partly account for anticipatory choices. Second, the analyses are replicated on the best high school graduates only, since disadvantaged students in this group can be expected to be strongly positively selected on non-cognitive skills. The estimates of the compensatory advantage after failure in higher education in this specific group can thus be interpreted as a lower bound estimate of the compensatory advantage.

The information about failure and success in the first year of higher education allows to distinguish between students who did not finish the academic year. Contrary to secondary education, students in higher education can easily stop their study at any point in the academic year, so those who decide to take all examinations should be less likely to have already decided to drop out from higher education. It may be that some students, although they have already decided not to re-enrol afterwards, still attend the whole academic year, but the anticipatory decisions bias should still be smaller in the group of students who reported failing their examinations. The previous analyses are thus replicated with a variable of performance in the first year which can take three values: pass, fail and withdrawal (Table A.1 in Appendix). The interaction terms between performance in the first year and social origin indicate that the impact of social background on dropout is much larger, -10 p.p., for

students who reported leaving the programme before the end of the academic year. Nevertheless, the CA hypothesis is still confirmed for students who failed examinations: controlling for academic readiness and type of programme, students from an advantaged background are every year 5.8 points less likely to dropout than disadvantaged students.

I then narrowed the sample to students who graduated on-time from an academic track and obtained a distinction: this group (N=1 672) represents around 30% of the initial analytical sample and only includes high school graduates who are best prepared for successful higher education studies. The aim is to focus on students who are most homogenous in terms of ability for higher education, to reduce the potential bias of endogeneity (Bernardi and Triventi, 2018). Given the importance of social selection in the choice of tracks and grade repetition in France (Bernardi and Cebolla-Boado, 2014; Ichou and Vallet, 2013), it is further possible to argue that disadvantaged students who were able to graduate on-time from an academic high school diploma with distinction are likely to be strongly positively selected in terms of motivations, aspirations, and cognitive and non-cognitive skills, compared to students from more advantaged social backgrounds.

In this subsample, dropout from higher education is a marginal phenomenon: after four years, less than 4% of students have left higher education without a degree (Table A.2 in Appendix). This confirms that these best high school graduates are very well prepared and motivated for higher education. However, the cumulative probabilities of dropout by academic outcome in the first year suggest a very clear pattern of compensatory advantage (Figure 2). It is striking to see that, in case of success in the first year of higher education, social origin does not influence dropout behaviour of this group, but that, in case of failure, social background is associated with a large gap in dropout patterns.

Figure 2

Among high-performing students failing their first year, more than one out of five disadvantaged students (22.9%) have dropped out by four years compared to only 4.7% only of socially advantaged students. It is worth noting that academic failure is not such a rare event in this group (20%), which should not be surprising since these best-performing students are also more likely to enrol in the most difficult bachelor's programmes where failure rates are the highest (medicine, law, etc. which are offered in universities and thus do not select students for initial access). Results from the multinomial logit models and the contrast of the predicted hazards of dropout by academic outcome and social origin further supports the CA hypothesis (Table 5). Social origin is irrelevant for dropout in case of academic success in the first year but in case of failure, students from higher backgrounds are much less impacted than disadvantaged students. Students from the most advantaged social backgrounds are every year 5.4 p.p. less likely to dropout. Given the very low annual hazard of dropout among this subsample, this is a large advantage for students from advantaged backgrounds.

Table 5

Finally, it may be that the compensatory advantage mechanism is only relevant in some institutional contexts. I thus replicated the analyses separately for each broad type of programme: professional, academic in universities and academic in prestigious institutions. These types of institutions differ widely in the cumulative probabilities of dropout which range from only 3.7% for students starting in prestigious programmes, to 17.4% in university and 18.7% for students starting in professional

programmes. However, in each case, the most advantaged students are much less likely (between -6.4 to -8.5 p.p.) to dropout in case of failure than the most disadvantaged group (Table A.3 in Appendix). Thus, the compensatory advantage hypothesis is supported for the three types of programmes.

Discussion and conclusion

The results presented here have confirmed the relevance of the compensatory advantage as a mechanism of social stratification in higher education. Even in the last stage of the educational system, advantaged students appear to be buffered against the impact of a negative outcome such as academic failure, and this result is also confirmed for the specific group of high-performing high school graduates. The results have also confirmed some of the earlier findings on dropout in French higher education, most notably that academic readiness, as measured by the track of the high school diploma, has the strongest impact on the probability of dropout. But with a comparable level of academic preparation, students who fail in their first year are much more likely to leave without any degree than those who succeed in their first year. The fact that it is also true for some of the best academically prepared students points to a worrisome loss of talented youths who had the skills to eventually graduate, even if in a different programme. Since disadvantaged students who reach eligibility and enter directly higher education, and especially those graduating on-time from the academic track, can be expected to be positively selected on a number of unobserved variables, these results raise serious concerns about the equity of the system and challenge the unqualified conclusion of a dissipating effect of social origin in higher education. These results are highly relevant to develop policies that aim to identify students most at risk of dropout and reduce social inequalities in higher education, but they also have theoretical implications which provide insights for further research.

The results in this article have identified a “lingering effect” (Davies and Guppy, 1997) of social origin on dropout patterns in an institutional context characterised by modest financial barriers and lower average dropout rates than many industrialized countries. It is especially interesting to note that looking at the average effect of social background on dropout patterns could suggest that social background has only a moderate effect on dropout patterns in France. Considering the heterogeneous impact of academic failure, instead, leads us to distinguish between the very small impact of social background in case of success and the large inequality in case of failure. However, heterogeneity in the effect of academic performance on dropout patterns, by social origin, remains largely unexplored. To my best knowledge, only Contini et al. (2018) recently estimated the social gap in persistence in Italian higher education separately for different academic profiles of students and find that social inequalities are much larger among students with the weakest academic background. Further research would thus be necessary to generalize the relevance of the compensatory advantage model in other higher education systems and to identify how institutional settings, financial barriers or entrance requirements, may moderate or reinforce the effect of social origin on dropout from higher education.

In addition, much remains unknown about the detailed mechanisms driving the compensatory advantage patterns identified in this article. Some plausible explanations, derived from the social stratification literature, were discussed in the theoretical section but could not be empirically tested. Since most of the literature on the compensatory advantage has focused on younger students, it

would be necessary to identify empirically the resources, financial or informational, which are relevant for higher education inequalities and that socially advantaged families may mobilise to compensate for academic failure in higher education. For example, there is evidence that socio-economically advantaged students in the U.S. invest in “shadow education” (i.e. preparation courses, tutoring) to boost their SAT test scores to guarantee higher education access, especially to elite institutions (Buchmann et al., 2010). However, empirical research on these questions remains scarce in the European context and it would be important to explore the use of private tutoring during higher education, especially in case of academic difficulties, to identify whether it may contribute to social inequalities at this level. There are also several alternative explanations coming from the large literature on dropout in higher education, which have not been discussed in this article. For example, Tinto’s work (1975) has pointed to the integration in the tertiary institution as a crucial factor for dropout behaviour and it would be interesting to see whether such processes of social and academic (dis)integration mediate the effect of social origin on dropout behaviour, especially after academic failure.

To conclude, three limits of the present study should be highlighted. Firstly, I cannot rule out that my estimates of the association between failure and dropout are biased by confounding variables. I found that the evidence of compensatory advantage after failure is robust to different estimations which attempted to account for endogeneity biases; but estimating the causal effects of failure in higher education on students’ trajectories would require another analytical strategy. In addition, the analyses rely on a relatively crude measure of academic performance in higher education, which only indicates failure or success in meeting all academic requirements in the first year of higher education studies. It would thus be necessary to confirm the patterns of compensatory advantage found in dropout patterns with finer measures of academic performance in higher education, such as yearly GPA to further explore the interplay between academic performance in higher education and dropout behaviour. Finally, the present study did not investigate stop-out (temporarily leaving higher education) nor transfer (changing programmes) behaviour. Differences in re-enrolment and re-orientation could both be driving the social inequalities identified in dropout patterns after failure in higher education and it would be necessary to distinguish between these two events to provide a more precise picture of inequalities in higher education trajectories.

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Notes

1. “Academic readiness” is used to refer to academic achievements at the end of secondary education. This term is meant to indicate that the type and quality of the diploma gained in secondary education is conceived as the result of both academic abilities and family choices during the secondary school career.

2. The hazard ratios in these models compare the hazard of the outcome of interest to the hazard of the non-event, which refers here to persistence without graduation. The prevalence of the non-event, and its association with the different explanatory variables, depends of the graduation opportunities in each programme, and for each year of study so that the association between the independent variables and the non-event is difficult to interpret. The average marginal effects and the contrast of predicted hazard of dropout are thus discussed to capture the association between the explanatory variables and dropout without reference to the patterns of persistence without graduation.
3. This may lead to an overestimation of dropout in the fourth year, by classifying what is actually a temporary interruption of studies as dropout. However, this bias is expected to be relatively small for two reasons. First, the later students interrupt their enrolment, the less likely they are to return to education (Pfeffer and Goldrick-Rab, 2011) and this pattern is confirmed in the present French sample. In addition, re-enrolling after a year or more of interruption is more common for socially advantaged students: in the present sample while 40% of students from the most advantaged social background, who left higher education, eventually re-enrolled by the fifth year, this is the case for only 11% of the most disadvantaged ones. Thus, defining dropout in the fourth year as non-enrolment for one year only can be expected to underestimate the social gap in dropout patterns.
4. Students who delay their entrance to higher education drop out more often than those who made this transition immediately so focusing on students enrolling immediately is expected to lead to a small underestimation of dropout rates. However, the proportion of students delaying their entrance to higher education in the present sample does not vary much by family background (7.7% for the most disadvantaged group “Less than HE & less than salariat” and 6% for the group “HE & salariat”) and further research would be necessary to identify whether the influence of social origin on dropout behaviour is the same among these students than among students who enter directly into higher education.
5. This is especially the case of students following the most prestigious programmes (around 14% of all students) who can only graduate after at least five years of postsecondary education.

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Author biography

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Table 1. Descriptive statistics of the study sample (new entrants in higher education in 2008).

Variable		Percent
Gender	<i>Male</i>	45.7%
	<i>Female</i>	54.3%
Parental education	<i>Less than high school</i>	36.7%
	<i>High school</i>	18.3%
	<i>Tertiary</i>	45.0%
Parental social class	<i>Working class</i>	14.9%
	<i>Intermediate</i>	49.5%
	<i>Salariat</i>	35.6%
Parental background	<i>Less than HE & less than salariat</i>	48.4%
	<i>Less than HE but salariat</i>	6.6%
	<i>HE but less than salariat</i>	15.9%
	<i>HE & Salariat</i>	29.1%
Track of high school degree	<i>Academic</i>	59.8%
	<i>Technological</i>	26.8%
	<i>Vocational</i>	13.4%
Age at high school graduation	<i>On time or in advance</i>	64.2%
	<i>One year late</i>	26.9%
	<i>2 years late or more</i>	9.0%
Performance in high school degree examination	<i>Second session</i>	10.5%
	<i>Pass</i>	38.3%
	<i>Distinction</i>	51.2%
Academic outcome in first year of higher education	<i>Pass</i>	73.8%
	<i>Fail</i>	26.2%
Type of higher education programme in first year	<i>Professional</i>	51.1%
	<i>Academic in university</i>	35.0%
	<i>Prestigious academic</i>	13.9%
Number of observations		5 590

Source: Enquête sur le devenir des bacheliers-2008-2012.

Table 2. Discrete time hazards of dropout and graduation.

Year	Hazards		Cumulative probabilities	
	Drop-out	Graduation	Drop-out	Graduation
1	4.3%	0%	4.3%	0%
2	6.5%	37.4%	10.5%	35.7%
3	7.0%	41.5%	14.3%	58.0%
4	6.8%	28.8%	16.2%	66.0%

Source: Enquête sur le devenir des bacheliers-2008-2012. N=5 590.

Table 3. Estimation results for the yearly risk of dropout (average marginal effects from multinomial logit models for students entering higher education immediately after high school graduation; results for the base outcome re-enrolment and graduation not reported).

Variables		Model 1		Model 2		Model 3	
Gender	Male (reference)						
	Female	-0.006*	(0.004)	0.004	(0.004)	0.001	(0.004)
Social background	Less than HE & less than salariat	0.074***	(0.004)	0.032***	(0.004)	0.030***	(0.004)
	Less than HE but salariat	0.034***	(0.007)	0.013*	(0.007)	0.022***	(0.008)
	HE but less than salariat	0.026***	(0.005)	0.021***	(0.006)	0.017***	(0.006)
	HE & Salariat (reference)						
Age at upper secondary graduation	On time or in advance			-0.017***	(0.004)	-0.015***	(0.004)
	1 year late (reference)						
	2 years late or more			0.008	(0.006)	0.008	(0.006)
Track of upper secondary degree	Academic			-0.042***	(0.004)	-0.045***	(0.005)
	Technological (reference)						
	Vocational			0.151***	(0.012)	0.158***	(0.013)
Distinction in upper secondary degree	2nd session			0.048***	(0.008)	0.033***	(0.007)
	No distinction (reference)						
	With distinction			-0.036***	(0.004)	-0.030***	(0.004)
Academic outcome in 1st year	Passed (reference)						
	Failed					0.077***	(0.005)
Type of HE programme-1st year	Professional					-0.002	(0.005)
	Academic in university (reference)						
	Prestigious academic					-0.016**	(0.008)
Year dummies		Yes		Yes		Yes	
Log Likelihood		-9200		-8543		-7416	
Pseudo-R ²		20.6		26.3		36.0	
Number of individuals		5 590		5 590		5 590	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Enquête sur le devenir des bacheliers-2008-2012.

Table 4. Effect of social background on the yearly risk of dropout by academic outcome in first year (contrast of predicted hazards of dropping out from models including an interaction term between social background and academic outcome in first year of higher education).

Social background	Academic outcome in 1st year	Model 4			Model 5			Model 6		
		Contrast of predicted hazards	S.E.	P>chi2	Contrast of predicted hazards	S.E.	P>chi2	Contrast of predicted hazards	S.E.	P>chi2
HE & Salariat vs no HE & no salariat (ref.)	Passed	-0.045	(0.004)	0.000	-0.017	(0.004)	0.000	-0.015	(0.004)	0.001
	Failed	-0.135	(0.010)	0.000	-0.065	(0.011)	0.000	-0.067	(0.010)	0.000
Controls										
Gender		Yes			Yes			Yes		
Academic readiness		No			Yes			Yes		
Type of HE programme-1st year		No			No			Yes		
Year dummies		Yes			Yes			Yes		
Log Likelihood		-8 764			-8 108			-7 410		
N		5 590			5 590			5 590		

Source: Enquête sur le devenir des bacheliers-2008-2012.

Table 5. Effect of social origin on the yearly risk of dropout of dropout for best high school graduates by academic outcome in first year (contrast of predicted hazards of dropout for students graduating on-time and with distinction from the academic track in high school, from models including an interaction term between social background and academic outcome in first year of higher education).

Social background	Academic outcome in 1st year	Model 1			Model 2		
		Contrast of predicted hazards	S.E.	P>chi2	Contrast of predicted hazards	S.E.	P>chi2
HE & Salariat vs no HE & no salariat (ref.)	Passed	-0.003	(0.003)	0.387	-0.003	(0.004)	0.388
	Failed	-0.054	(0.015)	0.000	-0.054	(0.015)	0.000
Controls							
Gender		Yes			Yes		
Type of HE programme-1st year		No			Yes		
Year dummies		Yes			Yes		
Log Likelihood		-2 276			-1 955		
N		1 672			1 672		

Source: Enquête sur le devenir des bacheliers-2008-2012.

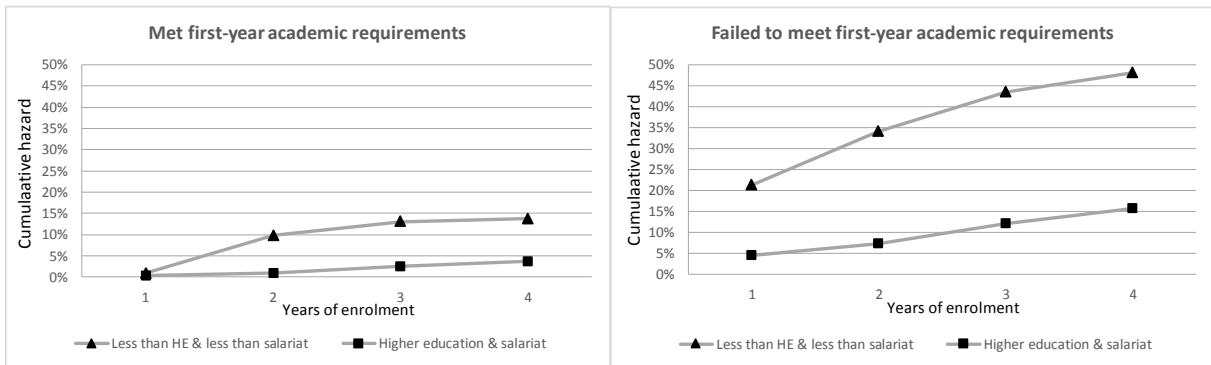


Figure 1. Cumulative probabilities of dropout by academic outcome in first year of higher education and social background; students entering higher education immediately after high school graduation. Source: Enquête sur le devenir des bacheliers-2008-2012. N=5 590.

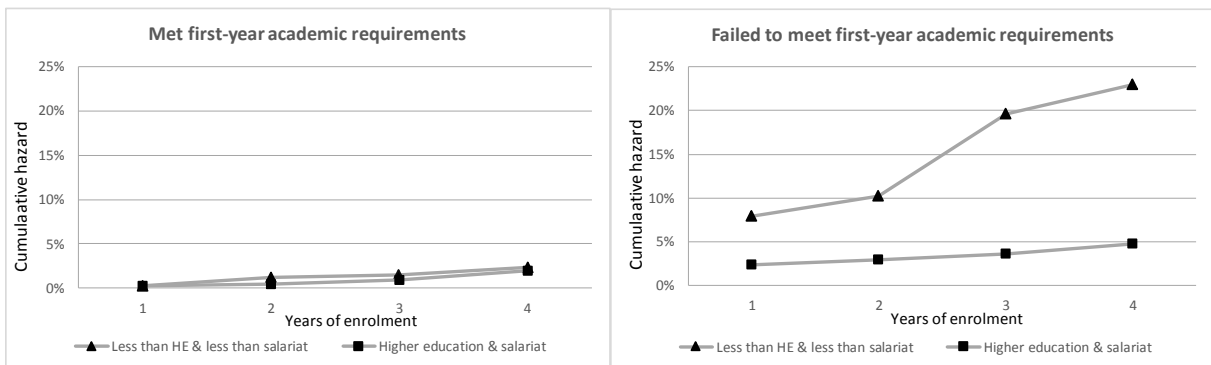


Figure 2. Cumulative probabilities of dropout by academic outcome in first year and social background; best high school graduates entering higher education immediately after high school graduation. Source: Enquête sur le devenir des bacheliers-2008-2012. N= 1 672.

Appendix

Table A.1: Effect of social origin on the yearly risk of dropout, by type of academic outcome in first year

Contrast of predicted hazards of dropping out based on models with an interaction term between social background and academic outcome (three categories) in first year of higher education

Social background	Academic outcome in 1st year	Contrast of predicted hazards			Contrast of predicted hazards		
		S.E.	P>chi2		S.E.	P>chi2	
HE & Salariat vs no HE & no salariat	Pass	-0.045	(0.004)	0.00	-0.015	(0.004)	0.001
	Failure	-0.124	(0.011)	0.00	-0.058	(0.011)	0.000
	Withdrawal	-0.163	(0.023)	0.00	-0.100	(0.023)	0.000
Controls							
Gender		Yes			Yes		
Academic readiness		No			Yes		
Type of HE programme-1st year		No			Yes		
Years		Yes			Yes		
Log Likelihood		-8 743			-7 399		
N		5 590			5 590		

Source: Enquête sur le devenir des bacheliers-2008-2012.

Table A.2: Discrete time hazards of dropout and graduation for students graduating on-time and with distinction from the academic track in high school

Students entering higher education immediately after high school graduation

Year	Hazard		Cumulative probabilities	
	Drop-out	Graduation	Drop-out	Graduation
1	0.9%	0%	1%	0%
2	0.5%	21%	1.4%	21%
3	1.5%	39%	2.5%	51%
4	2.7%	17.8%	3.8%	59%

Source: Enquête sur le devenir des bacheliers-2008-2012. N=1 672.

Table A.3: Effect of social background on the yearly risk of dropout, by academic outcome and type of programmes in first year

Contrast of predicted hazards of dropping out based on separate models for each type of programmes, with an interaction term between social background and academic outcome in first year of higher education

Social background	Academic outcome in 1st year	Professional			University			Prestigious		
		Contrast of predicted hazards	S.E.	P>chi2	Contrast of predicted hazards	S.E.	P>chi2	Contrast of predicted hazards	S.E.	P>chi2
HE & Salariat vs no HE & no salariat	Passed	-0.030	(0.008)	0.000	-0.006	(0.006)	0.322	0.001	(0.005)	0.910
	Failed	-0.078	(0.028)	0.006	-0.064	(0.011)	0.000	-0.085	(0.049)	0.083
Controls										
Gender		Yes			Yes			Yes		
Academic readiness		Yes			Yes			Yes		
Years		Yes			Yes			Yes		
Log Likelihood		-3 259			-2 980			-854		
N		2 856			1 955			779		

Source : Enquête sur le devenir des bacheliers-2008-2012.