Educational Inequality in Luxembourg

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1 June 2021

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Abstract

Luxembourg is ranked among the countries with the highest disposable income per capita in the EU; despite that, the society is characterised by a wide range of inequalities. In this paper, we focus on the educational dimension of inequalities and seek to provide a brief literature overview on the key features of disparities that exist in Luxembourg's education system. Our main intention is to define groups of children that are characterised as disadvantaged and describe the amount of inequalities they may face within or across their educational trajectories. We further proceed to discussing causes that scholarly discourse provides to explain the existence of these inequalities and measures that are expected to potentially minimise them.

Educational Inequality in Luxembourg

1. Most Vulnerable Groups

Educational inequalities are about individual advantages and disadvantages that emerge along certain axes as individuals pursue their education. In the case of Luxembourg, research refers to social origins, migration background and gender as the major axes for analysing disparities in learning performance and pathways that one observes among students (Hadjar et al., 2015). As such, the risk groups include low-social origin students, migrant-origin students and male students. These groups show lower competences, lower school grades and a lower likelihood of placement in more prestigious secondary educational tracks (Backes and Hadjar, 2017; Hadjar and Uusitalo, 2016; OECD, 2018).

The group of *low social origin students* is formed along the socio-economic status (SES) axis and largely includes working-class children. Working-class families are characterised by low-educated parents and a low disposable income. Poverty among working-class individuals is a common phenomenon. In 2017, 21.5% of people in Luxembourg lived below the poverty line, with children and adolescents especially at risk (23.6%) (OECD, 2018). Around 20 % of working people in Luxembourg are considered as working poor, with this proportion being one of the highest in the EU (OECD, 2018). Scholarly discourse names the high cost of housing and high taxation for single parents as underlying causes for economic disadvantages of the working class. Children coming from families with unemployed or low-educated parents, along with single mothers, are especially disadvantaged.

Research suggests that parents' socio-economic status may impact the extent of educational inequalities by determining class-specific resources (economic, cultural, and social) that affect children's cognitive skills or their learning conditions (Hadjar et al., 2018). A low disposable income constrains the amount of investments available for the acquisition of education by children. Parents' low level of education in turn limits the amount of emotional support that they can provide to their children, such as a positive attitude towards learning, a thirst for knowledge, and motivation that is necessary to learn in and outside of school.

Theoretical and empirical studies often analyse the SES impact on educational inequalities by distinguishing between primary and secondary effects. Primary social origin effects are attributed to differences in available resources across social classes that ultimately result in variations in school performance. Secondary social origin effects relate to the heterogeneity in educational decisions with regard to the choice of certain school tracks and educational pathways that one can observe across social classes. For instance, children from socially-disadvantaged families are less likely to choose academic tracks for their secondary school than children from socially-advantaged families since they are characterised by higher risks of failing in their studies. One should note that scholarly discourse in Luxembourg mostly focuses on the analysis of primary SES effects (Hadjar et al., 2015; Ress and Azzolini, 2014), with secondary effects receiving only limited attention. This is justified by the fact that the tracking decisions in Luxembourg's education system are taken by commissions with a limited say from parents or students (Griga and Hadjar, 2013).

With regard to the *migration background*, a number of studies show that migrant students, on average, have weaker performance at all levels of education (Becker et al., 2013). More specifically, they are characterised by a limited access to quality education; less chances to participate in pre-primary education; higher rates of dropping out before completing upper secondary education; lower academic scores; and higher probability to attend schools with peers

from less advantaged backgrounds. One should note that the migrant population of Luxembourg is very heterogeneous and, hence, not all of them are seen as disadvantaged. The majority of German- or French- speaking immigrants have a better education than Luxembourgers and come from more privileged socio-economic backgrounds (upper-middle class). Disadvantaged groups usually include immigrants from Portugal or Italy (Ugen et al., 2013), who are more likely to belong to lower classes and are characterised by lower educational attainments (Hadjar et al., 2018).

As in the case of social origins, literature analyses the impact of ethnic origins on educational inequalities through the concept of primary and secondary effects (van de Werfhorst and van Tubergen, 2007). Primary effects relate to differences in school performance between children with and without a migration background that persist even if the socio-economic status of the parental home is controlled for. One such effect, which is of particular importance to Luxembourg, is linguistic barriers that create a deficit in comprehension of subjects or local educational contexts. A number of studies show that natives and native-speaking migrant students commonly have better educational achievements than migrant students with a language background different from the country's official languages (Agirdag and Vanlaar, 2018). In particular, Portuguese-speaking students and students with a language background other than Luxembourgish or German are more likely to underperform due to cognitive disadvantages in meeting the phonetic and grammatical requirements in the language learning process (Le Nevez, 2011; Weth, 2015). More recent studies demonstrate though that in addition to ethnic origins, immigrant origins may influence the extent of educational inequalities in Luxembourg (Loureiro et al., 2019). Portuguese-speaking students – as a particularly disadvantaged group – may have lower achievements not due to their language as such, but due to their lower immigrant origins. Secondary effects of ethnic origins relate to the influence that various aspects of ethnic affiliation or migration background have on educational

decisions. On the one hand, migrant families prove to choose lower educational paths due to language problems. On the other hand, migrants may strive for better educational careers than people without a migration background since they see education as an essential tool that enables their integration into the society or labour market.

Finally, the third disadvantaged group of children is derived from the gender axis and includes *male students*. Empirical studies suggest that in Luxembourg two thirds of all children in the support system are male; boys are more likely to repeat a class and often leave school early or drop out of school (Backes, 2018). The integration of female students into education is recognised as a major reason for why boys now appear disadvantaged (Hadjar et al., 2015, 2018). In explaining gender effects on educational inequalities, literature again distinguishes between primary and secondary effects (Hadjar and Buchmann, 2016). Primary gender effects relate to differences in school performance between boys and girls that appear due to dissimilarities in motivational attitudes and behavioural patterns between the two sexes (Hadjar and Berger, 2011). These may include, for example, a greater degree of school alienation among boys (Hadjar and Lupatsch, 2010), their tendency towards deviating behaviour at school (Hadjar et al., 2015) or more frequent use of computer games (Hadjar et al., 2018). Secondary effects of gender relate to differences in educational choices that occur as a result of variations in the expected probability of successful school completion and the perception of the educational benefits that exist between the two sexes. On the one hand, the increased labour market opportunities for women may motivate girls to invest in education. On the other hand, secondary effects can be seen in the very stable gender-typical career choices of men and women (Hadjar and Buchmann, 2016). Multiple studies show that gender plays a significant role in how various professions are regarded creating gender-specific images of occupations (Hadjar and Aeschlimann, 2015; Haunberger and Hadjar, 2020).

2. Amount of Educational Inequality

In reporting the extent of educational inequalities in Luxembourg, we commence our analysis by providing a brief description of the educational system in Luxembourg. The compulsory pre-primary and primary school begins at the age of 4 and encompasses eight years of education, structured along four, two-year learning cycles. Towards the end of each two-year cycle, teachers evaluate whether students meet the requirements to continue to the next cycle. Performance in French and German language arts, as well as mathematics, are most decisive (Weth, 2015) during the transition between the primary school cycles and from primary to secondary schools. With the transition to a secondary school, students are placed in one of several distinctive parallel secondary school tracks starting at grade 7: The academic track leading to a general university-entrance certificate (ES: Enseignement Secondaire) or one of the technical tracks (EST: Enseignement Secondaire Technique) – namely EST-théorique as a track that also allows transition into tertiary education, EST-polyvalente and pratique as lower technical and strongly vocation-oriented tracks and the vocational track EST-préparatoire, also referred to as Modulaire, that mainly prepares for the later transition to vocational training or direct transition to the labour market, which is the lowest educational track in Luxembourg (Backes and Hadjar, 2017).

Regarding the *pre-school* level, educational inequalities have not been sufficiently analysed for Luxembourg. This is an enormous shortcoming considering the recent findings that show how strongly early childhood conditions may influence later educational performance and trajectories (see Merry et al. (2020) for a more detailed discussion). In the case of *primary education,* multiple studies analyse the distribution of educational inequalities by referring to social or ethnic origins and gender. Children from disadvantaged social groups are more likely to underperform than children from more socially-advantaged families (Backes and Hadjar,

2017; Glock and Krolak-Schwerdt, 2014; Weth, 2015). Sonnleitner et al. (2018) suggest, for instance, that the probability of achieving good or very good levels of reading comprehension in German is around 60 % for children coming from socially-advantaged families. This percentage drops to 26% when one focuses on working-class children. Similarly, 36% of socially-disadvantaged children underperform in mathematics, whereas this percentage is only 11% for children coming from more socially-privileged groups. These performance disparities become larger if in addition to the parents' socio-economic status, one accounts for ethnic origins of children. While only around 15% of Luxembourgish- or German-speaking children underperform in mathematics, the percentage amounts to around 50% (Sonnleitner et al., 2018) for those having other ethnic origins. With regard to gender, boys perform worse than girls but this difference is less pronounced. In reading comprehension of German, around 38% of boys and 34% of girls are characterised by poor educational attainments (below the "Socle" level), with a very similar trend found also for mathematics. However, reading skills prove to deteriorate more frequently among boys (4%) than among girls (2%) (Sonnleitner et al., 2018). Finally, many children are characterised by insufficiently developed motoric skills that also tend to be prone to the effects of external criteria, such as gender, migration background or social status (Scheuer and Bund, 2018).

These tendencies persist during students' *transition to, and performance in, secondary education*. Social origins continue to determine student performance in a secondary school. In 2017, only 10% of working-class children were oriented to the academic secondary school track (ES), which is less than in the previous years (14% in the 2013/14 school year). This percentage varies between 50% and 60% for students coming from socially-privileged families. Around 90% of students from socially-advantaged families possess good to very good reading comprehension skills in German, whereas around 60% of students of low social origins perform under the minimum ("Socle") level. These disparities can also be observed in the case of

mathematics: Only 18% of socially-advantaged children underperform in mathematics, whereas this percentage amounts to around 55% for children of low social origins. Ethnic origins further broaden the existing disparities in the orientation process or school performance (Dronkers and Korthals, 2016). Around 40% of Luxembourgish- or German-speaking students attend the academic ES track, while this percentage is only around 15% for the young people with a different language background. Conversely, migrant students are overrepresented in the lowest-level school track, with this trend to persist over the last decade (Hadjar et al., 2018). Many migrant students do not meet the educational requirements and, in particular, those related to language literacy in both French and German. Luxembourgers face fewer difficulties with German, presumably due to the similarities in phonological and grammatical structure of both languages (Wagner, 2016). The lusophone and, to a lesser extent, francophone students in contrast experience severe difficulties with regard to reading comprehension of German and show further difficulties in catching up on their weaknesses over time. These disparities are also pronounced in the case of mathematics (61% versus 36%) (Sonnleitner et al., 2018). Regarding gender, the inequalities in the orientation towards different school tracks prove to be stable over time and are characterised by boys having fewer educational opportunities than girls. The overrepresentation of boys in the lowest educational tracks tends even to increase from 9% in 2010 to 16.5% in 2017. The same trend applies to the performance in a secondary school. For instance, around 30% of boys and 23% of girls remain below level 2 in reading comprehension of German (grade 9), with mainly girls being able to improve at least partially their skills over time (Sonnleitner et al., 2018). In the case of mathematics, the gender disparities are insignificant, with 39% of girls and 42% of boys remaining under the level 2 in the ninth grade (Sonnleitner et al., 2018).

In the case of *mobility between the tracks*, recent empirical research suggests that social/migrant origins and gender again play a crucial role in the track change patterns (Backes

and Hadjar, 2017). Upward mobility is less frequent and more likely to take place among native students who are female and of privileged social origins. Downward mobility is a more common phenomenon in Luxembourg (Backes and Hadjar, 2017) and tends to vary across student groups. Low and medium SES students are two times more likely to leave the academic track (ES) than SES advantaged students. The likelihood of leaving the academic track (ES) early is also more than three times higher for vulnerable migrant groups than for natives. With respect to gender, 75% of girls manage to remain and complete the academic track (ES), whereas only 68% of boys are able to do so (Hadjar et al., 2018).

In transition to *post-secondary or tertiary education*, it is upper- and middle-class students that most often aspire to higher education. Regarding ethnic origin effects, migrant students tend to opt for an educational pathway below higher education. Empirical studies also reveal significant gender differences: Girls are more likely to aspire to higher education, while boys prefer lower educational pathways (Hadjar and Aeschlimann, 2015). Gender also plays an important role in the choice of occupation: Male students dominate all study levels in the exact sciences, engineering, economics, and in construction. The majority of female students are admitted to the fields of veterinary medicine, language, literacy, social sciences and humanities. Gender-stereotyped ideas affect the choice of occupation by triggering the process of steering towards gender-appropriate professional training and corresponding self-selection. A number of studies also point out to the importance of parental role models in children's career choices in Luxembourg (Georg, 2005; Hadjar and Scharf, 2019; Hadjar et al., 2021), with the mechanism of status reproduction being of crucial importance for the general decision to study (Lörz, 2012).

3. Causes of Educational Inequality

In overviewing causes for the existence of cross-individual differences in school performance and educational trajectories, we consider three levels of analysis: micro-, meso-, and macro – levels. When discussing *micro-level factors*, both theoretical and empirical studies often focus on the three common sources – social origins, migration background, and gender. Lower socio-economic status is associated with fewer educational and financial resources available to children, less educational support at home, and lower values attached to academic success. The migration background relates to the lack of financial, cultural, linguistic and social resources (Becker et al., 2013; Kristen et al., 2016). Gender differences tend to exist in educational attainments and trajectories due to attitudinal and behavioural heterogeneity between boys and girls (Becker, 2014; Bieri Buschor et al., 2014).

A *meso-level analysis* focuses on schools or universities as organisations and analyses institutional characteristics, such as school structures, selection procedures, pedagogical measures in the classroom, etc. (Gross and Hadjar, 2020). Schools create their own learning climate, teaching materials, and spatial conditions that affect educational inequalities (Grecu et al., 2019). For instance, if the composition of the school population previews that only children from poorly educated families remain in the classes with a low level of aspiration, children are likely to underperform in many subjects (Solga and Wagner, 2004). A homogeneous school population can further lead to a reduction in educational opportunities of disadvantaged children if teachers lower their expectations in view of the low level of competences in the class. By contrast, if the proportion of disadvantaged children in the school class does not predominate, the mixture can lead to improvements among lower-performing students, without high-performing students to deteriorate. Research also recognises that school-level practices are able to compensate for disadvantages in achievement, equalise group-specific cost-benefit calculations thereby constraining educational inequalities. In the case of Luxembourg, this issue, however, remains largely under-researched. Only few studies try to resort to the school-

level practices as a compensation mechanism to the problems caused by either individual- or macro-level characteristics. For instance, Loureiro et al. (2019) demonstrate that the negative effect of social origins on the performance at school can be offset if teachers use more than just the official language of instruction in the classroom. The educational gap in mathematics between native population and migrant children can be reduced if teachers switch to French or (in the few cases when teachers know Portuguese) to Portuguese in settings where German is the language of instruction and classes have a high proportion of Portuguese-speaking students. Alternatively, Agirdag and Vanlaar (2018) show that educational inequalities can be reduced if teachers may take into account multilingualism when grading by giving a bonus to students whose native language is not the language of instruction. Teachers' evaluations may make a difference and balance school marks and tracking decisions, ultimately reducing disadvantages associated with the language background. The analysis of meso-level educational practices has been recently expanded to shadow education. In a comparative study of 63 countries, Entrich (2020) shows, for instance, that in Luxembourg, investment in shadow education remains largely of remedial nature, with high SES families using it though more frequently to support their underperforming children to achieve advantages in vertical educational attainments.

Finally, there is a *macro-level of analysis* that refers to the key characteristics of both Luxembourg's education system and educational policy. Luxembourg's education system is characterised by large numbers of migrant children pursuing education in the country. Recent reports show that in school year 2018, the first language of 65% pre-primary and primary pupils was other than Luxembourgish; in secondary education, this proportion dropped to 58.4%, but still remained high (Sonnleitner et al., 2018). These high numbers of migrant children may explain the large extent of inequalities in educational achievements that characterise Luxembourg's educational system. The situation is also aggravated by the fact that education in Luxembourg is multilingual and uses the three official languages (Luxembourgish, French,

and German) as languages of instruction. The language-integrated learning process, in which French progressively becomes the language of instruction in some secondary school tracks (after German has been the alphabetization language in primary schools), contains a major cognitive burden for the Luxembourgish school population. This leads to difficulties in understanding subject-specific content, especially for migrant children. In addition, Luxembourg's education system is viewed as highly stratified (Hadjar and Becker, 2009, 2016; Kramer and Helsper, 2011) as it includes a number of secondary school tracks that exist in parallel and generate distinct educational pathways. This creates a sort of path-dependence in educational trajectories in which previously attended tracks determine later school careers, educational careers, school-to-work transitions, and work careers. A number of studies demonstrate that the segregation of students into various academic and vocational school tracks can be a cause for the existence of extensive educational inequalities in Luxembourg (Hadjar and Becker, 2009, 2016; Hadjar and Gross, 2016; Kramer and Helsper, 2011). Although the intention behind stratification or external differentiation is to create homogeneous learning environments and to foster students' performance capacities, it deprives students in lower educational tracks from common socialisation with peers who achieve higher educational performance and who could serve as role models for better school performance (Gross et al., 2016; Hadjar and Gross, 2016). The negative effects of stratification are also enhanced in the case of Luxembourg by the early selection of students into distinct school tracks, low mobility between the parallel tracks, and a strong link between educational pathways and distinct future educational or occupational opportunities (Esser, 2016; Hadjar and Gross, 2016). Overall, the level of stratification in Luxembourg's education system has been found to be stronger than in any other country that uses the stratified approach to organise secondary education (see Hadjar et al. (2021) for the comparison with the Swiss Canton of Bern) due to limited internal differentiations and less opportunities for track changes.

One should note that recent research emphasises the need to analyse the interactions between the individual-level characteristics and macro-level factors. A number of studies refers to a strong interplay between social and migrant origins in producing educational disparities, but also their importance relative to the education systems' effects (Becker 2014; Blossfeld et al., 2015; Esser, 2016; Gross et al., 2016; Hadjar and Buchmann, 2016). For instance, existing educational disparities resulted from social or ethnic origin effects tend to increase in more stratified education systems, whereby higher tracks are more likely to show an underrepresentation of more disadvantaged students (Griga and Hadjar, 2013; Hadjar and Gross, 2016).

4. Measures Against Educational Inequality

Scholarly discourse offers a wide range of ideas for how to reduce educational inequalities in Luxembourg. In the *pre-school* sector, a large number of studies focuses on measures promoting the foreign language acquisition. Given the central importance of German for everyday learning in the primary school, Sonnleitner et al. (2018) suggest that German should be introduced very early in the Précoce or in cycle 1 of the primary school. They propose to teach German as a foreign language to allow children, who do not speak a language similar to German at home, to build up their vocabulary later needed for understanding, reading and writing learning content in German. Hu et al. (2018) suggest to expand this practice to both languages of instruction and also include French, along with German, from the early age in order to achieve a more relaxed relationship with these languages. At the same time, they argue for an active inclusion of children's native language into the learning process and assert that disregarding the linguistic repertoire of students can hinder the learning progress and weaken their self-esteem. In addition to foreign language acquisition, early age is believed to be favourable to solving reading problems in children. Engel de Abreu (2018) refers to scientific

research regarding the tremendous importance of preschool reading challenge for the later reading and learning success of a child. A number of studies show that with the right pedagogical methods and adapted didactic materials, these so-called preliminary skills for learning to read can be effectively developed among children. Research also shows that these early reading practices help recognise potential reading or spelling difficulties among children at an early stage that can be corrected through a targeted support before the child begins a primary school. Finally, to achieve expected outcomes at the pre-school level, the scholarly discourse advocates for the need of standardisation (Neumann, 2018). This challenge in particular arises from the fact that the measures initiated for quality development face enormous heterogeneity of practices and organisational structures that has emerged from different traditions. For example, the field of non-formal education for children in Luxembourg is not only divided into a conventional and a private sector, but the organisational forms and conceptual orientations of the private day-care structures themselves are again very different (Honig and Bock, 2018).

In the case of *primary and secondary education*, research focuses on the macro-level reforms aimed at minimising stratification of education systems in Luxembourg. Although a number of international studies have demonstrated that comprehensive schooling systems may function effectively (see, for example, a discussion on Scandinavian countries), Luxembourg's political discourse does not address this practice to a sufficient extent. Reforms aiming at eliminating the stratified nature of the local education system remain a kind of taboo in Luxembourg (Backes, 2018; Hadjar and Rothmüller, 2016) and only have been introduced as an experiment in several schools. One such example is the project PROCI (Projet pilote cycle inférieur) that has established a new technical secondary school track by uniting students of different performance levels. The project's long-term effects are though still subject to the evaluation. Alternatively, Backes and Hadjar (2017) suggest that if no political consensus can

be reached regarding eliminating the stratified nature of the local education system, educational reforms may consider the possibility of enabling more permeability in secondary schools. The idea of permeability across educational tracks was brought to the agenda in Luxembourgish educational debates in the late 1970s but did not find sufficient support at that time gaining, however, more interest among scholars now. In addition, multiple studies focus on the need for meso-level reforms. Sonnleitner et al. (2018) suggest the expansion of school autonomy would allow to locally adjust teaching standards to the characteristics of the student population in classes. Pit-ten Cate and Krischler (2018) emphasise the need to change overall values and norms that underlie teaching behaviour towards disadvantaged children. Recognising problematic students as problematic and not regular students would allow teachers to use more structured and intense teaching and hence contribute to raising their performance at school.

The academic discourse also elaborates on the multilingualism as one of the key sources of educational inequalities in Luxembourg. By using the test of cognitive potential, Muller et al. (2018) show that relatively many students perform under their potential, with around 78% of them speaking neither German nor Luxembourgish at home. Research emphasises the need to address the language problem in the educational system of Luxembourg to narrow performance disparities between natives and migrant students. At macro-level, scholars suggest to introduce bilingual books. The idea of bilingual literacy (in German and French) has been implemented in Luxembourg in various school projects since the 1970s but for various reasons, none of the projects was continued (Dirim et al., 2011). Morys (2018) suggests that Luxembourg can use the experience of other multilingual countries (Canada or Switzerland), especially regarding the didactic-methodological teaching methods and materials. Finally, a number of studies emphasise the need for a more standardised monitoring of learning success at schools. They point out that it is necessary to strengthen the role of the recently created *Luxembourg Centre for Educational Testing* (LUCET). School monitoring through the survey

in various grades may allow to track even more precisely when students drop out of regular school or when and through which measures an improvement in student performance becomes possible in Luxembourg. Muller et al. (2018) advise that the regular performance tests should be supplemented with cognitive tests in order to better assess students' potential. They further suggest to expand the use of the cognitive test results to the decision-making process in the given context of orientation.

5. Conclusions

Our literature overview suggests that the Luxembourgish education system is characterised by the presence of severe shortcomings of both meso- and micro-levels, which combined with disadvantaged individual characteristics create extensive educational inequalities among children. In spite of multiple theoretical and empirical research, it still remains unclear what direction educational reforms in Luxembourg should take. Scholarly discourse should be used to devise possible measures able to minimise these inequalities or ultimately eliminate them. In addition, proponents of reforms need to create a good political discourse in order to promote a large-scale reforming of the national education system. As a conservative welfare state, Luxembourg strives for the reproduction of the existing class structure in society, with the education system playing an important role in this process. One can expect a lot of opposition to the introduction of any substantial change that can potentially deprive education policy of this function.

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