Gender Inequalities in Educational Pathways

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Abstract

The central idea of this paper concerns the gender gap in educational pathways. This issue can be addressed from more perspectives. On the one hand, we can analyse this problem from the socialization process perspective. Through this process, individuals learn how to behave and make some evaluations regarding a particular aspect of their lives, in our case the decision-making process in educational career choices. What we can observe here in this paper, is the fact that the socialization process is gendered, prescribing from the earliest stages of life specific educational routes for men and women. On the other hand, we can move further and we can use another perspective such as the expectation-values theory. This theory takes into account the self-perceptions of students regarding their strengths and weaknesses within some disciplines. After this self-evaluation students make some decisions with respect to their future field of study that subsequently will shape their professional career. From the perspective of gender segregation, there are important and persistent disparities due to the uneven concentration of women and men in various fields of study, an issue that should be studied and addressed more, particularly in terms of policies. Therefore, this issue will be presented and analysedin this paper by using the literature in this domain of interest. Also, I will use some statistical data to support this statement.

Introduction

In many parts of the world, encouraging students to choose a program of study in science, technology, engineering, mathematics and computer science (disciplines known as "STEM") has been for a long time a defining result of national innovation strategies. Increased focus on STEM disciplines may be related to their contribution to a country's competitiveness and economic prosperity (Hango, 2013).

However, the choices regarding educational trajectories are being shaped by the assigned gender of a person.Certain educational pathways were reserved for the female gender. This kind of educational fields leaned more towards domains of study such as humanities or arts, while the male gender was characterized by fields of study such as mathematics, science, engineering, and technology. Even though these gender differences regarding the choice of a certain educational path have faded, they continue to exist today as a consequence of the socialization process that is still quite gendered.

Underrepresentation of girls and women in science, technology, engineering and mathematics (STEM) is a global phenomenon (Stoet and Geary, 2018). Although it was identified in some studies that a large number of women predominate in the fields of social and life sciences (Ceci, Ginther, Kahn, & Williams, 2014; Su and Rounds, 2016), their underrepresentation is still very salient in areas that focus on inorganic phenomena, such as computer science. Notwithstanding the considerable efforts to understand and change this aspect, the gender gap in STEM-related disciplines continues to persist even today(Stoet and Geary, 2018).Even though, there were many attempts of approaching this matter, the discrepancies

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remained and continue to hinder the solving of the problem. This is why it is necessary to look at this problem from another angle (Ibid.).

Literature Review

Decision-making processes that take place at the individual level lead to a cumulative result that is represented by gendered patterns in educational choices. According to the Rational Action Theory, people, after considering the probabilities of success, costs and benefits they can perceive of various options, they choose a specific educational path according to its probability of achieving something (Erikson and Jonsson 1996). “The set of available alternatives as well as the perception of benefits and costs are limited by certain external structures, such as the set-up of the education system or the labor market” (Lörz, Schindler and Walter, 2011, p. 182).Thus, „gender patterns in educational choices evolve because the decision-making process differs across the genders”(Ibid.).

Thereby, using the proper literature, I will provide an explanation of the hypothesis that argues the perception of benefits that come from educational trajectories present some dissimilarities according to gender. As stated by socialization theories, individuals have separate passions and objectives, mainly by gender(Charles and Bradley, 2002).Consequently, women view the advantages of educational trajectories taking into account distinct matters compared to men. For instance, women prefer more occupations that enable social connection, empathy or prosocial behavior(Marini, Fan, Finley, & Beutel, 1996), while men have a bigger interest in obtaining jobs with good pays and chance of promotions (Bradley, 2000; Davies and Guppy, 1997).Another explanation concerns the differences between life-plans. Jobs that permit a synergy of family responsibilities and work or a facile reintegration into the labor market after a period of maternity leave are assumed to be particularly attractive to women (Reskin, 1993).

A prevalent statement found in the research domain concerning this issue is that the roots of gender segregation in higher education reside in the earlier stages of students' educational careers, mainly in high school (Ayalon 2003). The participation of female students in advanced mathematics and science courses in high school is relatively low for several reasons that have been identified as a result of research in the field: some are related to the attitude of girls towards this field of study, and others to school influence. Research on students' attitudes has focused on their lack of interest in mathematics and science, their belief that these areas of study are irrelevant to their careers, and their anxiety generated by mathematics (Ibid.). Researchers focusing on school influence refer to negative messages coming from teachers and counselors, male curriculum orientation in math and science, the small number of female teachers who can serve as role models, and differential school policy in assigning students to advanced courses in these fields (Ayalon 2003).

In study conducted by Stoet and Geary (2018), they found an important contextual factor that seems to influence women's participation in STEM disciplines and professions. They discovered that countries who present a great level of gender equality have one of the biggest STEM differences in secondary and tertiary education, called by them “the educational-gender-equality-paradox”. The students' rational choices have a central role in describing the stated paradox and it comes from the expectation-values theory point of view (Ibid.).

Based on this theory, students are considered to use their knowledge about what subjects in school they believe they have the best performance so that to use this as a starting point in their future decisions about what educational paths and/or career to choose(Wang, Eccles, & Kenny, 2013).There is a common belief that students prefer a certain education career based on their perceived strength and weaknesses regarding to some courses because of the well-known practice of school counselors. This is explained by the fact that “when students have the opportunity to choose their coursework in secondary

education, they are typically recommended to make choices based on the basis of their strengths and enjoyment" (Stoet and Geary, 2018, p. 582).

Stoet and Geary (2018) discovered that girls and boys obtained similar scores in science skills in most countries. Also, they identified that math or science have a great probability to be a school subject at boys are better than girls, based on an examination of differences between students regarding strengths and weaknesses in school courses. They also found that the association between gender discrepancies in educational ability and university graduation rates in STEM disciplines is higher in countries with gender equality. They are saying that "for each of the 67 countries and regions participating in 2015 PISA, we first tested for sex differences in science literacy(i.e., average score for boys – average score of girls, by country)"(Stoet and Geary, 2018, p. 585). They "found that girls outperformed boys in 19 (28.4%) countries, boys outperformed girls in 22 (32.8%) countries, and there was no statistically significant difference in the remaining 26 (38.8%) countries" (Ibid.).They also calculated "the percentage of boys and girls who had science, math, or reading as their personal academic strength […]"(Stoet and Geary, 2018, p. 585)."On average (across nations), 24% of girls had science as their strength, 25% of girls had mathematics as their strength, and 51% had reading. The corresponding values for boys were 38% science, 42% mathematics and 20% reading" (Ibid.).

Therefore, Stoetand Geary (2018) argue that in the situation where boys have relatively better performance in science and math, and girls have relatively better results at reading than in other fields of study, there is a possibility of significant gender differences in educational pathways related to STEM subjects. These differences are the results of the expectation-values theory and are in line with previous findings. The dissimilarities arise from an apparently rational choice to follow certain educational trajectories that support their own qualities in education that is also a common feature of school counseling given to students (Ibid.).

From the point of view of feminist critical approaches, gender is a principal cultural framework in the coordination of behaviour and the organization of social relationships. It usually acts as a contextual identity that influences the performance of behaviors assumed on behalf of organizational roles and identities (Ridgeway, 2009). The researches show that gender classification unconsciously generates stereotypes in the minds of individuals, making them cognitively available to model behavior and judgments (Blair and Banaji, 1996; Kunda and Spencer, 2003). Thus, in contexts that involve people of the opposite or same sex, gender stereotypes implicitly shape behavior and judgments as far as gender is culturally defined as relevant to that situation, for example, a gender typified task, such as mathematics (Ridgeway and Correll, 2004; Ridgeway and Smith-Lovin, 1999).

Thereby, what creates gender inequalities is how people understand and relate to gender differences between individuals. Such prejudices and behaviors in turn leads people who are subjected to them to review their attitude so as to fit the expectations and standards generally accepted by society. These situations can also have profoundly negative effects, in the sense that individuals become increasingly confused about their own identity, both personal and gender, because despite the fact that they do what is considered normal and appropriate for them, they do not feel and do not consider that this reflects their genuine personality.

Methodology

In the following part of this paper I present and analyze some statistical data about the results of Romanian pupils in the PISA 2018 evaluation and regarding gender disparities in educational choices and trajectories. In order to do that I will use statistical data provided by OECD, Eurostat and EIGE.

Data Analysis

In Romania, girls recorded similar scores to boys in mathematics. In contrast, in all OECD countries, boys outperformed girls by five points. While girls slightly outperformed boys in science (by two points) on average in OECD countries, in the PISA 2018 evaluation, in Romania girls and boys performed similarly in science (OECD, 2019).

Among students with high performance in math or science, 1 in 8 boys in Romania expect to work as an engineer or professional scientist at age 30, while 1 in 2 girls expect to do the same (however, the difference is not statistically significant). About 1 in 3 high-performing girls expect to work in health-related professions, while less than 1 in 10 boys with similar performances expect to do the same. Approximately 14% of boys and 2% of girls in Romania expect to work in ICT-specific professions (Ibid.).

In the following paragraphs I will present statistical data regarding the distribution of pupils and student in different area of education by gender in Romania.

According to the data provided in Table 1 and Table 2, there were no significant changes in the preferences of high school and post-high school students regarding the field of study during the years 2016, 2017 and 2018. As we see in the both tables, educational choices are influenced by sex in general. However, the only fields of study in upper-secondary education that do not register significant gender discrepancies are Agriculture, forestry, fisheries and veterinary (Males – 6.8%; Females – 5.4% in 2018) and Services (Males – 25.7%; Females – 25.5% in 2018). In the opposite sense, gender exerts a significant influence on the field of study in Education, where the share of boys, despite the fact that it is small, remains constant, and the share of girls shows a slight increase annually. Also, male students are overrepresented in Engineering, manufacturing and construction, while females in Social sciences, journalism and information.

Table 1. Pupils enrolled by education level, sex and field of education, in 2016, 2017 and 2018, Romania.

Upper-secondary education - vocational	2016		2017		2018	
Field of education	Males	Females	Males	Females	Males	Females
Education	0.3%	4.3%	0.3%	4.7%	0.3%	4.8%
Arts and Humanities	4.5%	6.7%	4.7%	6.9%	4.7%	7.1%
Social sciences, journalism and information	11.4%	20.3%	11.6%	19.3%	11.8%	19.1%
Business, administration and law	0.8%	1.6%	1%	2%	1%	1.9%
Agriculture, forestry, fisheries and veterinary	6.5%	5.3%	6.5%	5.4%	6.8%	5.4%
Engineering, manufacturing and construction	54.4%	38.3%	51.7%	37.1%	49.8%	36.3%
Services	22.3%	23.4%	24.2%	24.6%	25.7%	25.5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Eurostat, [educ_uoe_enra03]

In the case of Post-secondary non-tertiary education – vocational (Table 2), the most salient gender gap resides in Health and welfare field of study, where the share of boys and girls is much dissimilar and remains the same during the years included in this analysis.For the field of study in Information and Communication Technologies, we can see that gender differences is not very significant (Males – 6.5%; Females – 2.4% in 2018).

In the case of Engineering, manufacturing and construction, the gender disparities are even wider than for upper-secondary education. Similarly, the differences are higher in the case of Services as compare with upper-secondary education. So, for vocational education, higher the level of qualification, higher gender disparities.

Table 2. Students enrolled by education level, sex and field of education in 2016, 2017 and 2018, Romania

Post-secondary non-tertiary education - vocational	2016		2017		2018	
Field of education	Males	Females	Males	Females	Males	Females
Business, administration and law	3.5%	2.7%	3.4%	2.8%	3.3%	2.7%
Health and welfare	33.0%	81.0%	32.8%	80.2%	33.5%	81%
Agriculture, forestry, fisheries and veterinary	4.8%	1.7%	4.9%	2.1%	4.7%	1.9%
Information and Communication Technologies	6.6%	2.4%	7.2%	2.5%	6.5%	2.4%
Engineering, manufacturing and construction	31.8%	6.2%	31.4%	6.6%	31.3%	6.3%
Services	20.4%	5.9%	20.3%	5.9%	20.7%	5.7%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Eurostat, [educ_uoe_enra03]

According to the European Institute for Gender Equality - EIGE (2019), at national level there has been an increase in the score of educational achievement and participation, which is due to a growing number of tertiary graduates between 2005 and 2017. The share of women with higher education is 14% (compared to 8% in 2005), while the share of men with higher education is 13% (compared to 9% in 2005). Also, Romania has almost met its national strategic objective EU 2020 to have 26.7% of people aged between 30 and 34 with higher education. The current rate is 25% (28% of women and 21% of men). However, despite improvements in terms of segregation, the unequal concentration of women and men in different fields of study in tertiary education remains a challenge. About 32% of women and 17% of men study in fields such as education, social sciences, health or humanities and arts (Ibid.).

Table 3. Students enrolled in tertiary education by education level, sex and field of education in 2016, 2017, 2018 in Romania

Tertiary education	2016		2017		2018	
Field of education	Males	Females	Males	Females	Males	Females
Education	0.6%	5.1%	0.7%	5.4%	0.7%	5.5%
Arts and Humanities	7.6%	10.6%	7.6%	10.4%	7.6%	10.3%
Social sciences, journalism and	5.5%	11.5%	5.3%	11.2%	5.5%	11.6%

Tertiary education	2016		2017		2018	
information						
Business, administration and law	18.6%	28.7%	18.9%	28.3%	19.3%	27.6%
Natural sciences, mathematics and statistics	4.2%	5.9%	3.8%	5.3%	3.7%	5.3%
Health and welfare	8.9%	16.3%	9.6%	17.1%	9.5%	17.3%
Engineering, manufacturing and construction	33.1%	12.8%	32%	12.7%	30.9%	12.6%
Information and Communication Technologies	9.3%	3.4%	9.9%	3.7%	10.3%	3.8%
Agriculture, forestry, fisheries and veterinary	6.3%	3.5%	6.3%	3.6%	6%	3.5%
Services	6%	2.3%	6%	2.3%	6.4%	2.4%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Eurostat, [educ_uoe_enrt03]

In the last table (Table 3), there is the distribution of males and females by the field of study in the tertiary education. An interesting fact is the share of men and women in the Business, administration and law field of study that is slightly different from the above tables. There are more women enrolled in this domain of study than men, comparing to the shares in upper-secondary education and post-secondary education. In the case of Engineering, manufacturing and construction, the gender disparities keep its trend, with a little increase in the share of female students of six percentage points on average, compared with the case of post-secondary education.

This table confirms what EIGE (2019) claims about the uneven concentration of men and women in some area of study in tertiary education. There are 45% of females and just 23% of males in domain related to education, social sciences, health and arts and humanities in 2018 in Romania. Also, this data correspond with the PISA 2018 evaluation in Romania, were boys and girls obtained similar scores in science skills. Moreover, there is a difference of almost two percentage points (1.6) between the share of males and females enrolled in Natural sciences, mathematics and statistics field of study, where are more women than men, even though the differences are small. But, the dissimilarities remains solid in Information and Communication Technologies domain of education, where are 4% of females and 10% of males enrolled in this field.

Conclusions

In this paper I aimed to identify gender inequalities from the perspective of educational pathways adopted by students. In achieving this objective, I consulted the literature in domain, which revealed that girls and boys differ in terms of choices regard educational pathways because of the evaluation they make before, taking into account the benefits they can gain later. However, this decision-making process is greatly affected by the way children were socialized, includingin education, which risks leading to gender discrepancies in tertiary education and also in subsequent professional life.

At the national level, from the point of view of the PISA 2018 evaluation, girls and boys obtained similar scores in mathematics and science, compared to the results obtained in OECD countries, where boys outperformed girls in mathematics, but girls outperformed boys in science.

From the perspective of gender segregation, there are important and persistent disparities due to the uneven concentration of women and men in various fields of study,an issue that should be studied and addressed more, particularly in terms of policies.

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