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Access to University Studies: A New Form of Discrimination for Low-Functioning People

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Abstract: Although it would seem that we are currently in a more inclusive society, the reality is quite different, since discriminatory models continue to be perpetuated based on the level of functional performance of each person. In this sense, the purpose of this study is to find out the degree of discrimination that people with low functional performance have in relation to the rest of the population on the basis of sex and level of studies. To this end, through a thorough investigation based on the scientific method and articulated via statistical analysis (the modelling of categorical data), this study reveals the situations of inequality to which people with low functional performance are subjected in terms of higher education. This study used the survey on Employment of People with Disabilities (EPD), carried out by the National Statistics Institute (INE), and conducted annually with a sample size of 60,000 households, equivalent to some 200,000 people. The statistical analysis was carried out using R software and the main techniques used were contingency table modelling, log-linear models, and logistic models. Finally, some recommendations are offered to contribute to social awareness, for which the role of teachers is a crucial element for educational equity and their training is of vital importance, as teachers are a key element in adapting contents to different abilities, especially for people with lower functional performance. The quality of the initial training they receive will depend on their achievement.

Keywords: teacher education; low functional performance; gender; higher education

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1. Introduction

1.1. Employment as an Aggravating Factor in Inequality: Double Discrimination against Women

According to the National Statistics Institute [1], there are 1,876,900 people in Spain who are disabled, which represents 6.2% of the country's total population. At present, society continues to discriminate and to develop an enabling discourse, which perpetuates a medical-rehabilitative pattern (in which disability is seen as an illness and only once people are rehabilitated or cured can they fully develop their lives in society). It also moves away from the much-vaunted (and at the same time desired) social model that sees disability as a matter of social responsibility, and through which it is understood that it is social barriers that give rise to the discriminatory situations experienced by disabled people. Proof of this is the treatment they receive from the different social spheres; for example, the visibility they receive in the media is practically non-existent. Even when news items are written, they are written inappropriately, using language with pejorative and denigrated connotations (such as the word "handicapped") and projecting an image of people with disabilities as individuals deserving of the pity of the rest of society [2]. In this regard, López-Sánchez, Utray, & Ruiz [3] noted that 30% of news items in digital newspapers do not comply with the indications set out in the Style guide on disability for media professionals [4], which establishes the guidelines to be followed by journalists

and other information professionals to avoid falling into stereotypes and discrimination towards these people.

On the other hand—as in other areas of society—there is a gender gap, which reveals a situation of double discrimination, firstly because of the fact of being a person with a disability and secondly because of the mere fact of being a woman.

Another of the situations of discrimination faced by people with disabilities is the difficulty they have in accessing quality education, which is accentuated when it comes to higher education. In this respect, according to the INE study [1], 34.4% of the population had higher education, a percentage that fell to more than half (to 16.9%) in the case of people with low functional performance. Taking orientation as the starting point as a key element for successful access to higher education, as stated by [5] when studying the guidance of 82 first-year undergraduate students at the Rey Juan Carlos University in Madrid who have low functional performance, they reported a high percentage of people who—because they are in a situation of disability—did not receive any type of guidance from their educational centre of origin, specifically 64.29%. This undoubtedly contributes to perpetuating situations of discrimination and violations of the rights of these people, since not only is the necessary support not provided to gain full access to the education system, but the lack of information on the possible aids available to them makes the search for and access to these aids a daunting task.

Also, in the field of employment—which is undoubtedly closely linked to education—people who are discriminated against because of their low functional performance (which we refer to when talking about disability) are discriminated against and find it difficult to find employment. So much so that—in 2019—77.7% of the population was in employment, while the percentage of people with disabilities in employment was only 34% [1]. Undoubtedly, this reveals an abysmal—and worrying—difference that demonstrates the limited capacity for inclusion and equal employment opportunities that society offers these people. The study by Méndez, Martínez and Santos [6] takes a snapshot of economic activity in the Region of Murcia with regard to people who are discriminated against because of their lower functional performance, showing that, as one of the Spanish autonomous communities, which in 2014 had the highest percentage of people with disabilities (7.2% of the total population), surpassed only by Asturias and the two autonomous cities of Ceuta and Melilla, it had a low activity rate for people with disabilities, namely 76.6% for the general population and 44.9% for the population with low functional performance. In this respect, although this rate is higher than the Spanish average (38%), these data show that there is still too great a gap and that there is still a long way to go before people discriminated against on the grounds of low functional performance can live a full life. A theoretical framework for the employment of people discriminated against on the grounds of low performance is vital.

With regard to the recruitment of people with disabilities in 2015, there was a large gender gap: in Spain, 39% of employment contracts for people with low functional performance were for women, while 61% were for men (these percentages for the rest of the population were 45.6% and 54.4%, respectively). However, this difference is even more marked if we focus on the data for the Region of Murcia, where only 29.8% of contracts for people with disabilities were for women, while contracts for men accounted for 70.2% (for the rest of the population they were 42.8% and 57.2%, respectively). This again shows the double discrimination suffered by women, both because they have a disability and because they are women.

In terms of gross annual salary in Spain, according to the latest available data for 2013, there is a 16.1% pay gap between the salaries of people with low functional performance and the rest of the population, which is a far cry from an egalitarian society. Finally, with regard to the existence of Special Employment Centres (CEEs) aimed at creating jobs for people with low functional performance, the Region of Murcia is one of the communities with the lowest number of CEEs (according to the latest data for 2011), with a total of 43 out of a total of 2172 in Spain, a fact that contrasts with the proportion in Andalusia (which has almost 1 out of every 3 EWCs in Spain).

In other words, when we find (to give an example) a scenario in which a young person with Down's syndrome is rejected in a job interview as a telephone operator because the employer believes that the candidate does not have what is legally known as the capacity to understand (or because the company is not prepared for this situation, etc.), we would clearly be facing a situation of discrimination in which the reason would be functional performance (in this case, a low functional performance at an intellectual level). In other words, as we know, situations of discrimination can have different motives, and given that disability is a human rights issue, when talking about situations of discrimination on the grounds of disability (for us, the appropriate semantics would be "on the grounds of functional performance"), the focus should be on the fact that we would be facing a situation of discrimination [7].

1.2. The CRPD as a Key Element in Preventing Discrimination against People with Disabilities

In order to avoid all of the above-mentioned situations, on 13 December 2006, the United Nations General Assembly—after several years of work—adopted the International Convention on the Rights of Persons with Disabilities (hereinafter CRPD), which represents a novelty and a paradigm shift in everything related to people with low functional disability, recognizing the rights of these people, their equality, their incorporation into society, their autonomy, and their contribution to society.

However, as can be understood—and the statistics make it possible to verify this—despite the fact that this convention should be binding and a legislative reference framework for the States and Parties that ratified it at the time, it is unquestionable that it is not being implemented—or at least not in practice. Thus, in the face of commonly perpetuated situations of discrimination, the CRPD establishes the general principles that should be followed, including non-discrimination, respect, equal opportunities, integration into society, and equality between men and women—among others—(Article 3). Specifically, Article 5 deals with equality and non-discrimination, committing the States and Parties to the Convention to recognise all persons as equal before the law independently of each other (Article 4). The States and Parties to the Convention undertake to recognise all persons as equal before the law, irrespective of their functional performance, by adopting specific measures to promote such equality. The same applies to Article 6 (which deals with women and girls with disabilities, highlighting the double discrimination they suffer), urging states to adopt measures to alleviate this situation so that they can enjoy their rights and freedoms on an equal footing with other members of the community.

Article 19 recognises the need to adopt rules to ensure inclusion and the right to independent living for people with disabilities, so that they have the freedom to choose where and how to live, that they are supported to become full members of the community, and that society's services are accessible to the whole community.

On the other hand, Article 24 deals with the right to education of persons with disabilities. In this article, States and Parties must ensure that the education system is inclusive at all levels of education, with the aim of developing the talents, creativity, and personality of all members of society by fully involving persons with lower functional performance. To this end, education must be adapted to the diversity found in the classroom so that no one is excluded from the education system because of their condition. For example, by promoting the use of sign language, Braille, or other forms of communication, full access to the education system can be given to any person at any level of education.

Articles 23 and 25 deal with the right of people with disabilities to form a family. They should be free to marry and start a family, as well as free to choose the number of children they wish to have, while maintaining their fertility, just as all other members of society do. In order for this to be done in a planned and healthy way, sex education programmes should be provided for them in the same way as for other people.

Lastly, Article 27 of the Convention deals with work and employment, which deals with the right of people with low functional performance to be able to work, with the same opportunities as other people. In order to preserve this right, discrimination on the grounds

of low functional performance is prohibited in the selection and recruitment process, and fair and equal working conditions are advocated regardless of functional performance. It also stipulates that they will be included in job search and maintenance programmes and that the entrepreneurial spirit of people with lower functional performance will be promoted. In addition, recruitment in both the public and private sectors will be boosted through various measures such as hiring incentives. However, despite the social and legal importance of this legislation as a guarantee of the rights of people with disabilities (and their families), the social reality in which we find ourselves is quite different, and there is a need for awareness-raising to instil respect for these people and the inherent dignity which—by virtue of the fact that they are disabled—they possess. To this end, education as a driving force for social change is key, making it absolutely necessary, on the one hand, for true educational inclusion and, on the other, for the appropriate training of future teachers, since if the pupils who pass through our education system are educated in accordance with the postulates set out in the CRPD, these situations—as set out above—will be more likely to be the result of the lack of respect for the rights of these people and the inherent dignity they possess, and as above (in Section 1.1.)—will eventually be eradicated.

In the social context of Spain, the CRPD has had a significant impact on several aspects:

Recognition of Fundamental Rights: The convention has contributed to the recognition of the fundamental rights of persons with disabilities in Spanish society. Measures have been implemented to guarantee equal opportunities and non-discrimination in various areas, such as education, employment, health, and participation in cultural and political life.

Accessibility: The CRPD has promoted improvements in the accessibility of physical, technological, and communication environments. Initiatives have been undertaken to make public spaces, transport, information, and communication technologies accessible to all people, regardless of their abilities.

Educational Inclusion: The convention has been influential in promoting educational inclusion. Policies and practices have been implemented that seek to ensure that persons with disabilities have access to inclusive, quality education tailored to their individual needs.

Labour rights: The CRPD has had an impact in the field of employment, promoting equal employment opportunities and combating discrimination in the workplace. Measures have been implemented to facilitate the integration of persons with disabilities into the labour market and to ensure that they have access to fair and adequate working conditions.

Social and Political Participation: The convention has advocated for the active participation of persons with disabilities in social and political life. Measures have been implemented to ensure their participation in electoral processes, as well as in other aspects of community life.

Despite these advances, it is important to note that there are still challenges and areas for improvement. Full implementation of the CRPD is still an ongoing process, and further work is needed to overcome barriers and inequalities faced by persons with disabilities in Spanish society. In addition, public awareness and sensitisation on the rights of persons with disabilities are also crucial for achieving full and effective inclusion.

In addition, the Convention on the Rights of Persons with Disabilities (CRPD) has had a significant impact on policy planning for persons with disabilities. Here are some of the highlights:

Rights-based approach: The CRPD has promoted a paradigm shift in policy planning from a welfare-based approach to a rights-based approach. This implies recognising that persons with disabilities have fundamental rights that must be respected, protected, and guaranteed on an equal basis with others.

Active participation of persons with disabilities: The convention stresses the importance of the active participation of persons with disabilities in making decisions that affect their lives. In policy planning, this translates into direct consultation with persons with disabilities and their representative organisations, ensuring that their voices and experiences are taken into account.

Inclusion at all levels: The CRPD calls for the inclusion of persons with disabilities in all aspects of social, economic, and cultural life. Accordingly, planned policies should

address accessibility in physical, technological, and communication environments, as well as ensuring equal opportunities in areas such as education, employment, health, and participation in public life.

Removal of barriers: The convention stresses the need to remove barriers that impede the full participation of persons with disabilities. This includes physical, communication, technological, social, and cultural barriers. Planned policies should identify and address these barriers to ensure equal access and opportunities.

Monitoring and accountability: The CRPD establishes a framework for monitoring the implementation of its provisions. This implies the need to establish monitoring and evaluation mechanisms in policy planning to ensure that commitments are being met. In addition, the importance of national and international accountability is highlighted.

Cross-sectoral coordination: As disability encompasses various aspects of life, the CRPD stresses the importance of cross-sectoral coordination in policy planning. This involves collaboration between different government departments, as well as the participation of civil society and organisations of persons with disabilities.

In summary, the CRPD has influenced policy planning by promoting a rights-based approach, active participation, inclusion, and the removal of barriers. Successful implementation of these policies contributes to the creation of a more inclusive and equitable society for persons with disabilities.

1.3. Initial Teacher Training as a Key Driver of Change

In this respect, it is absolutely necessary to focus on initial teacher training as a matter of priority, in order to avoid perceiving teaching practice as a narrowly defined scenario, with hardly any scope for action in the design of educational action, and also to avoid the use of certain unidirectional methodologies in which learners are not actors in their teaching process, but where their learning is completely accentuated—and isolated—by the issues that the teacher decides to address in tune with the stipulated learning standards [8].

Furthermore, given that a large number of students from different academic backgrounds are currently studying for a master's degree in teacher training, it would be of interest (as a first step) to find out how future teachers perceive students who are discriminated against on the grounds of low functional performance. In a few months' time, they will be the ones in the classroom, and it is on them that the success of the inclusion of all students in the classroom will depend. On this topic we can find the study carried out by Gil [9], where he analysed the attitude of 107 students of the Master's Degree in Teacher Training at the Complutense University of Madrid, distinguishing between the different specialisations of this Master's Degree. The general attitude of all students towards people with low functional performance was positive, with no significant differences being found if we distinguish between the parents' levels of studies, nor between sexes, nor if we take into account the contact that the students have had with people with low functional performance. These results imply that future teachers have favourable attitudes towards the diversity that may be found in the classroom and, therefore, if they receive adequate training, they could create an inclusive and favourable environment for the social development of their pupils as a whole [10,11].

Based on a literature review, the general objective of this work was to find out the degree of discrimination that people who are discriminated against on the grounds of gender and level of education have in relation to the rest of the population. The specific objectives, which have also been defined, are described below:

1. To find out the probability that a person with low functional performance has of having higher education.
2. To identify the differences that exist between women and men with low functional performance with respect to the probability of having a high level of education.
3. To determine the probability of a person with low functional impairment to have higher education with respect to sex and the rest of the population.

2. Methodology

In order to determine whether there are indeed differences between people with less functional impairment and the rest, a statistical study was carried out using the information produced by the National Statistics Institute (INE), since it is public and open-access data. Within the information contained in the survey El Empleo de las Personas con Discapacidad [1], 3 variables were selected that were of interest and that could be related to each other: Sex (with the categories Male and Female), Studies (with the categories University and Non-University), and the variable Disability (composed of the categories Yes or No). In order to organise the information, a three-dimensional contingency table was drawn up, considering the variable Study (E) as the response and the variables Sex (S) and Disability (D) as explanatory variables.

The dependence between them was then studied in order to subsequently adjust them to a model that would make it possible to clarify the influence of some variables on the others. For this purpose, we have mainly used techniques for constructing models in contingency tables, log-linear models, logistic models, etc. For the theoretical monitoring of these processes, see [12,13]. Meanwhile, the practical part has been conducted with the R program, and for its adequate monitoring, we can refer to [14].

2.1. Instruments

The instrument used for data collection was the Employment of People with Disabilities (EPD) survey, which was drawn up by the National Statistics Institute (INE) and is carried out annually. Its objective is to ascertain the employment situation of people of working age, including those with low functional performance. In order to carry it out, data from different public bodies are collected, and it is also combined with the information obtained from the Economically Active Population Survey (EPA), carried out every three months.

2.2. Sample

The population scope of this work (based on the aforementioned instrument) is the general population aged 16 to 64 and those with low functional performance who reside in main family dwellings throughout the national territory. As mentioned above, one of the main sources of the DHS is the LFS, whose sample (according to the criteria used by INE in 2019) consists of 3588 sections and 18 dwellings per section, except in the provinces of Madrid, Barcelona, Seville, Valencia, and Zaragoza, where the number of interviews per section is 22 (previously, the sample was set at a total of 3000 sections, and an average of 20 dwellings per section were investigated). Thus, the sample size was about 65,000 households, which in practice was reduced to about 60,000, equivalent to about 200,000 persons [1].

2.3. Data Analysis

Firstly, the data were reorganised without taking into account the variable Sex, since the main relationship of interest was that of Disability and Studies; that is, the marginal table of the variables Disability and Studies was calculated controlling for Sex, and then, the data were analysed in order to determine the relationship between Disability and Studies. We then tested whether or not the data were marginally dependent. As we had a two-dimensional contingency table, the Chi-square test of independence was carried out, using the chisq.test command in R, which by default uses this test with the Yates correction [15]. This correction is made when the expected frequencies are less than 5 (i.e., if total independence were to occur), adding 0.5 to each cell to avoid possible 0's. As—in this case—the expected frequency of all of the cells in the table was greater than 5, it has been indicated that this correction should not be applied. The hypotheses of this test are:

H_0: *The variables are independent.*

H_1: *There is an association between the variables.*

On performing the test, the R program returns the value of the associated *p*-value, so that if this was greater than $\alpha = 0.05$ there would not be sufficient evidence to reject the null

hypothesis of independence, and the variables would be considered to be independent. If, on the other hand, a lower value was obtained, the null hypothesis would be rejected and it would be considered that there is dependence between the variables.

As the independence test indicated that there was a relationship between the variables, the advantage quotient associated with this marginal table was calculated to find out how and to what degree the possible relationship exists. The result was a two-dimensional table (Table 1) with two rows and two columns, with n_{ij} frequencies, i rows, and j columns:

Table 1. Bidimensional table 2 × 2.

	Explanatory Variable	**Response Variable**
Category 1	n_{11}	n_{12}
Category 2	n_{21}	n_{22}

Note: n = number of variable.

The sample value of the associated benefit quotient has then been obtained by applying the following formula:

$$\hat{\theta} = \frac{n_{11}n_2}{n_{12}n_{21}}$$

The interpretation of the advantage ratio is as follows:

$\theta = 1$: the variables are independent.

$\theta > 1$: there is a positive association between the variables.

$\theta < 1$: there is a negative association between the variables.

Moreover, since the advantage is defined as p = prob.success, it allows us to know how much more likely it is to occur in one category rather than the other. In order to be able to test whether there are differences between the categories of the variable Sex, partial tables have been calculated where only the variables Studies and Disability are represented, but this time distinguishing between men and women. The advantage quotient has also been calculated for these tables in order to find out how the variables are related and whether there are differences between the two sexes. It has also been necessary to check whether or not Simpson's paradox is present, whereby when the variables are considered separately, one type of association is observed, while when they are considered together, a completely opposite association is observed. To this end, it was checked whether there were differences of association in the partial tables and in the marginal table. To confirm whether or not there were differences between men and women, the Woolf test (found in the vcd package of R) was calculated; this test allows us to know whether the advantage quotients are the same regardless of sex and that, therefore, there are no differences between the two. The hypotheses of this test are:

$$H_0: \theta_1 = \theta_k$$
$$H_1: \theta_1 /= \theta_k$$

If a p-value > 0.05 is obtained, there is insufficient evidence to reject the null hypothesis, and, therefore, all advantage ratios will be considered equal; on the contrary, if the p-value < 0.05, the null hypothesis will be rejected and the advantage ratios will be considered different depending on sex.

If in Woolf's test, the null hypothesis cannot be rejected and it is considered that the advantage quotients are equal, then the Mantel–Haenszel test will have to be calculated with the mantelhaen.test command that comes by default in R, in order to check if the advantage quotients, besides being equal, are equal to 1 and, therefore, the variable Sex does not influence the others. The hypotheses of this test are:

$$H_0: \theta_k = 1$$
$$H_1: \theta_k / = 1$$

Selection of a Logit Model

The log-linear model allows us to know the association between the different categories of the variables, and thanks to it, the equivalent logit model can be found. This new model has its parameters defined as log-odds (logarithm of the quotient), which allows each conditional category to be related to each combination of the rest of the predictor categories. Firstly, the log-linear model was fitted using the Backward method found in the MASS package [15,16]. The Backward method consists of starting with a complex model and sequentially deleting terms until any elimination of terms leads to a model with a significantly worse fit. The elimination criterion is based on the *p*-value: the term with the highest *p*-value among all those that exceed the previously set significance level is always eliminated.

Once the best-fitting model was obtained using the Backward method, it was necessary to check whether this model fit correctly by means of the goodness-of-fit test provided by the programme itself when using the Backward method. If the *p*-value > 0.05, the model fits the data adequately, since there would not be sufficient evidence to reject the null hypothesis (which is that the data can be obtained from the model without significant differences). Subsequently, the explicit function associated with the model was calculated and the equivalent logit model was obtained, checking whether it fulfils the necessary hypotheses to relate it to the previously calculated log-linear model. These hypotheses are:

H1: *Contains the main effect of the response.*

H2: *Contains the interactions between the response variable and each of the explanatory variables of the logit model.*

H3: *Contains the highest order interaction among all of the explanatory variables.*

Once the hypotheses were satisfied, the model was fitted in R using the glm function. To check that the model was adequate, it was necessary to calculate the standardised residuals left by the model, i.e., the amount of information that the model leaves unexplained. All of them were calculated, and then they were checked to ensure that they were outside the interval (1.96/1.96). If this amount represented more than 20% of the total, the model was inadequate because of excess residuals.

Once the model was adequate, we proceeded to the interpretation of the model parameters by means of the exponential of the parameters, obtaining the associated advantage ratio. On the other hand, it had to be taken into account that there could be non-significant parameters; this was checked by calculating the confidence intervals and observing how many of them contained the value 0, in which case the parameter would not be significant.

3. Results

In order to carry out the analysis, a series of commands were used, which can be found in Appendix A. Firstly, to read the data in R, the read.spss command found in the foreign package was used, since the data were originally entered in the SPSS program version 28. The data were organized in a three-dimensional table with the following result (Table 2):

Table 2. Educational level and disability by sex.

Sex		**Studies Level**	
	Disability	**Non University Studies**	**University Studies**
Man	No	9,358,000	4,783,300
Man	Yes	912,800	153,900
Woman	No	8,795,300	5,605,800
Woman	Yes	646,500	163,700

Source: INE (2019) data [1].

3.1. Relationship between Variables

The analysis began with the study of the marginal table of the variables Disability and Education, controlling for the variable Sex (Table 3):

Table 3. Marginal table controlling for sex.

	Studies Level	
Disability	**Non University Studies**	**University Studies**
No	18,153,300	10,389,100
Yes	1,559,300	317,600

Source: INE (2019) data [1].

On calculating the test of independence, a p-value < 0,05 was obtained, so that the null hypothesis was rejected and it was therefore considered that there was a dependence between the condition of disability and having or not having higher education. Subsequently, the advantage quotient associated with this marginal table was calculated and the following result was obtained:

$$\theta = 0.356$$

For better interpretation, the inverse was calculated as follows: 1 = 2.8

Thus, the advantage of having a university education was 2.8 times greater for the general population than for people with low functional performance. We then calculated the partial tables with their advantage ratios distinguishing by sex and checked whether or not it influenced the other variables (Table 4).

Table 4. Partial table men.

	Studies Level	
Disability	**Non University Studies**	**University Studies**
No	9,358,000	4,783,300
Yes	912,800	153,900

Source: INE (2019) data [1].

The ordinal advantage ratio associated with this table was also calculated, obtaining a value of $\theta = 0.33$. For its interpretation, the inverse 1 = 3.03 was calculated, concluding that the advantage in favour of having a university education was three times greater for men in the general population than for men with low functional performance (Table 5).

Table 5. Partial table women.

	Studies Level	
Disability	**Non University Studies**	**University Studies**
No	8,795,300	5,605,800
Yes	646,500	163,700

Source: INE (2019) data [1].

The ordinal advantage quotient associated with this table was calculated, obtaining a value of $\theta = 0.397$. For its interpretation, the inverse 1 = 2.51 was also calculated, with the result that the advantage in favour of having a university education was 2.51 times greater for women in the general population than for those with low functional performance.

Therefore, the existence of Simpson's Paradox was ruled out since both in the partial and marginal tables negative advantage ratios (<1) were obtained. In order to verify the absence of interaction, Woolf's test was carried out, obtaining a p-value much lower than alpha = 0.05, so that the null hypothesis was rejected and it was considered that there was no absence of interaction.

The null hypothesis was rejected and it was considered that there is no interaction, which is why the advantage quotients were not considered equal for men and women, there being differences between the two sexes.

Once the null hypothesis has been rejected, the calculation of the Mantel–Haenszel test is meaningless (which is why it has not been carried out).

3.2. Selection of a Logit Model

Applying the Backward method to the analysis of the data, it was concluded that the best-fitting model was the saturated model, precisely because it relates all of the variables to the other variables, the short form of which would be DSE. Since this model (which included all of the variables) was a perfect fit, the residuals were considered null and the goodness-of-fit test yielded a *p*-value = 1, resulting in the following explicit function:

$$ln(m_{ijk}) = \mu + \underset{i}{\lambda^{D}} + \underset{j}{\lambda^{S}} + \underset{k}{\lambda^{E}} + \underset{ij}{\lambda^{DS}} + \underset{ik}{\lambda^{DE}} + \underset{jk}{\lambda^{SE}} + \underset{ijk}{\lambda^{DSE}}$$

This log-linear model implied the following logit model (Figure 1):

$$ln\left(\frac{m_{ij1}}{m_{ij2}}\right) = (\mu + \underset{i}{\lambda^{D}} + \underset{j}{\lambda^{S}} + \underset{1}{\lambda^{E}} + \underset{ij}{\lambda^{DS}} + \underset{i1}{\lambda^{DE}} + \underset{j1}{\lambda^{SE}} + \underset{ij1}{\lambda^{DSE}}) -$$

$$-(\mu + \overset{D}{\lambda_{i}} + \overset{S}{\lambda_{j+}} + \overset{E}{\lambda_{2}} + \overset{DS}{\lambda_{ij}} + \overset{DE}{\lambda_{i2+}} + \overset{SE}{\lambda_{j2+}} + \overset{DSE}{\lambda_{ij2}}) =$$

$$= (\lambda_{1}^{E} - \lambda_{2}^{E}) + (\lambda_{11}^{DE} - \lambda_{12}^{DE}) + (\lambda_{j1}^{SE} - \lambda_{j2}^{SE}) + (\lambda_{ij1}^{DSE} - \lambda_{ij2}^{DSE}) =$$

$$= \alpha + \underset{i}{\tau^{D}} + \underset{j}{\tau^{S}} + \underset{ij}{\tau^{DS}}$$

Figure 1. Applied logit model. Source: own elaboration.

which corresponds to the previously obtained log-linear model (DSE) as it fulfils the previously stated hypotheses:

H1: *It contains the main effect of the answer since the term* $\lambda^{E}{}_{k}$ *appears.*

H2: *It contains the interactions between the response variable and each of the explanatory variables of the logit model since the terms* $\lambda^{DE}{}_{ik}$ *and* $\lambda^{SE}{}_{jk}$ *appear.*

H3: *It contains the highest-order interaction among all of the explanatory variables. This is also true since the term* $\lambda^{DSE}{}_{ijk}$ *is present.*

Subsequently, the model was adjusted in R, thus obtaining a better result since, as it corresponded to the saturated model, it took into account all of the variables, so that there were no residuals and the overall goodness-of-fit test provided a *p*-value > 0.05. Thus, by estimating the parameters of the model using maximum likelihood, it was found that the model fitted the data perfectly, obtaining the following result (Table 6):

Table 6. Model parameters.

Parameters	Estimation	Lower Extr. IC	Upper Extr. IC
α	1.3735	1.3681	1.3789
$\tau \underset{1}{D}$	−0.9231	−0.9286	−0.9175
$\tau \underset{1}{S}$	0.4066	0.3990	0.4143
$\tau \underset{11}{DS}$	−0.1859	−0.1937	−0.1781

Note: D = Disability; S = Sex; DS= Disability Sex; Lower Extr. IC = lower limit of the confidence interval; Upper Extr. IC = upper limit of the confidence interval.

It was observed that none of the confidence intervals used for the estimation contained the value 0, and it was found that all of the parameters were significant in the model, and the following interpretation was made:

$\hat{\alpha}$. The chance in favour of not having a university education over having one is exp(1.37) = 3.93 times greater for those with low functional performance who are also female.

$\hat{\tau}$DE. The effect of the variable Disability on the variable University Studies is given by:

$$\theta \text{DE} = \exp(\hat{\tau}_1^{\text{D}} - \hat{\tau}_2^{\text{D}}) = \exp(-0.9231) = 0.3972$$

For a better interpretation, its inverse 1 = 2.5170 has been calculated, showing that the advantage in favour of having a university education rather than not having one is 2.517 times greater for the general population than for those who are discriminated against on the grounds of low functional performance.

$\hat{\tau}_{11}^{\text{SE}}$. The effect of Sex on the variable University Studies is given by the advantage ratio:

$$\theta^{\text{SE}} = \exp(\hat{\tau}_1^{\text{S}} - \hat{\tau}_2^{\text{S}}) = \exp(0.4066) = 1.5017$$

This means that the advantage in favour of not having a university education over having a university education is 1.5017 times greater for men than for women.

$\hat{\tau}_{111}^{\text{DSE}}$. The effect of the sex variable, together with the fact—or not—of being discriminated against on the grounds of low functional performance, shows a relationship with university education, which is defined by the advantage quotient:

$$\theta^{\text{DSE}} = \exp(\hat{\tau}_{11}^{\text{DS}} - \hat{\tau}_{22}^{\text{DS}}) = \exp(-0.1859) = 0.8303$$

The inverse 1 = 1.2 has also been calculated for the sake of interpretation. The result is that the advantage in favour of having a university education (over not having one) is 1.2 times greater for men than for women (referring to the population that is not discriminated against on the grounds of low functional performance).

4. Discussion and Conclusions

In light of the results obtained, the discrimination suffered by people with disabilities in the different social spheres covered by this study is clear. In this respect, it is clear that the advantage of having a university education is 2.8 times greater for people who are not disabled than for those who are, and this difference is greater among men than among women. This can be seen in one of the interpretations of our model, which indicates that the probability of not having a university education is 1,5 times greater for men than for women. In other words, there is a greater difference between nondisabled people and people with disabilities if they belong to the male gender (Table 7).

This may be due to the change in the trend that has been observed in universities for some years now, a change that originated in the mid-20th century with the empowerment of women and which has had the effect of increasing the number of women studying at university, currently exceeding the number of men. According to data from the study by [17], which studies the proportion of women and men at the University of Granada, 60% of students during the 2018/2019 academic year were female. However, according to this study, there were large differences between the different branches of knowledge. This could be the reason for the differences observed in this study between the two sexes, irrespective of whether or not there was any discrimination on the basis of functional performance. These differences are undoubtedly striking, since men are generally more likely to have no university education, but if disability is taken into account, there is a much greater difference in men than in women: men with disabilities have less higher education than women with disabilities (each in relation to their own sex).

On the other hand, it was found that the advantage in favour of having a university education was 2.5 times greater for people who were not in a situation of disability than for those who were. This approach fulfils one of the objectives of this study, namely that

people with disabilities are excluded from many aspects of society, and higher education is no exception.

Table 7. Results of the discrimination suffered by people with disabilities.

E	D	S	Advantage Ratio	Interpretation
Yes	No/Yes	-	2.8	2.8 times more likely than the general population to be university-educated
Yes	No/Yes	M	3	3 times more likely to have a university education for men than men in the general population.
Yes	No/Yes	W	2.5	2.5 times more likely to have a university education for women than for women in the general population
No	-	M/W	1.5	1.5 times more likely to have no university education for men

Note: E = study; D = Disability; S = Sex; M = Man; W = Woman.

This theory can be compared with various studies such as that of [18–21], which showed that the presence of students with disabilities at university is very low (0.5% of students), a lower percentage when compared with the incidence of people with low functional performance in the general population. And despite the increasing frequency of integration programmes (such as grants and scholarships aimed at increasing the presence of this group in higher education), the negative relationship between having a higher education and being discriminated against on the grounds of low functional performance is corroborated, a fact that is intolerable if we are to move towards a society which loudly calls for equal rights for all people. In this respect, everything suggests that the necessary measures should be adopted to ensure that consideration is given to the perceptions of those who are systematically discriminated against (on the grounds of their functional performance) and who, despite this, have managed to study at university, since—as protagonists—they are aware of the shortcomings of the education system and the variables directly involved in the low enrolment rate among the population with the lowest functional performance. As can be seen in the research by [19], in which testimonies were collected from students at the University of Seville who were discriminated against because of their functional performance, the students found it difficult to complete bureaucratic procedures (such as completing enrolment or simply finding out how university credits work). Also striking is the testimony of blind people who call for greater attention from the University to adapt its contents without having to depend on external institutions (such as the ONCE (Spanish National Organization of the Blind)). It can therefore be concluded that if the situations they complain about were to improve, it would be possible to achieve a higher percentage of people with low functional performance who would be able to study at university, thus complying with Article 24 of the CRPD. For example, the adaptation of the subject material—depending on the level of performance—or for teaching staff to know—personally—the needs of each of their students in order to be able to adapt to them could alleviate these situations. Another example would be to be able to rely on the advice of a guidance unit to help them with all of the bureaucratic procedures involved in the university course. Finally, the involvement of other classmates (in the form of volunteer programmes) would facilitate the integration of all of the diversity of the student body. In short, all of these supports—if carried out correctly—could help alleviate these situations.

If we focus on the perception that university students (in general) have classmates who are discriminated against because of their functional performance, another of the conclusions reached through this study is the predisposition of students to share classrooms with other students with low functional performance. In this sense, it is worth highlighting the study by [20,22], which analyses the perception of students at the University of Santiago de Compostela about their classmates. It shows that although for the most part the data show that students have a positive attitude towards their peers, there is some controversy in some areas. For example, half of the respondents consider that there should be no flexibility in the requirements for the acquisition of university degree competences, regardless of the degree of functional performance; on the other hand, more than 25% consider that there should be adaptations (while there was a high percentage of undecided respondents on

this issue). These results could be due to students' lack of knowledge of the subject or even due to the fact that they have little connection with the subject of diversity. In addition, it may also be influenced by the competitiveness experienced at the university and the fact that students feel that people with low functional performance are favoured and get the degree more easily than others (and unfairly).

Finally, and as indicated in the theoretical framework, it is also clear that the role of teachers is fundamental to the evolution towards an egalitarian society, since we have full confidence in education as the backbone of our civilization. It is precisely for this reason that investment should be made in good training for teachers so that they know how to deal with, adapt, or present content to people with higher and lower functional performances. In the Master's program we are studying, we are trained to be teachers; however, we have not been educated to work with people with low functional performance [23,24]. Classroom diversity was mentioned in the psycho-pedagogical block without going into depth. In this specific block, we have not been given material to deal with these situations, which would have been very enriching. Besides, in mathematics, we can find specific conditions such as dyscalculia, and it is of vital importance to recognize it and know how to carry out the teaching if we find people who have difficulty with basic mathematics.

Finally, teachers need to set an example with inclusive attitudes as young people spend many hours of the day in schools and take their teachers as role models; so, using the popular slogan 'teachers are the real influencers', let us make our teachers examples of pedagogical and personal inclusion.

Limitations and Proposals for Improvement

After carrying out this work, it has become clear that there are few official statistics on the subject of functional diversity. The DBS, for example, which is only carried out annually, obtains its data from other surveys and from other official bodies. On the part of the INE, the most interesting study on this subject is the macro-survey known as the Survey on Disability, Personal Autonomy and Dependency Situations, which has only been carried out three times in history: in 1986, 1999, and 2008. These studies only collect a great deal of information on people who are discriminated against because of functional impairment, taking into account different variables that are of interest and that have been selected—consciously—and put into practice through a questionnaire. However, the latest data are thirteen years old and this information (in particular) is therefore out of date, hence the need for specific and periodic surveys on disability to provide an image of the situation in our country. Similarly, and with respect to the variables in this paper, it would have been very interesting to select other variables that could influence the attainment of higher education (such as the type of functional performance engaged, the degree of performance, economic income, etc.). However, the variables present in the EPD were limited, and access to the data was complicated, and it was not possible to relate them to as many of the variables as we would have liked. On the other hand, the length of this study did not allow us to analyse many more variables, which is why we invite other researchers to investigate the field of functional diversity in order to make society aware of the inequality that some citizens still suffer today.

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Data Availability Statement: The data presented in this study are openly available in [1].

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Appendix A

```
library(MASS) library(foreign) library(vcd)
datos=read.spss("datosINE2.sav", to.data.frame = T) tabla=xtabs(Casos~Discapacidad+ Estudios+Sexo, datos) tabla
#MARGINALES Discapacidad- Estudios controlando sexo
tablamarg<-margin.table(tabla,c(1,2)) tablamarg #Discapacidad y Estudios chisq.test (tablamarg,correct=F) odds.ratio<-function(x,alpha=0.05)
{
theta <- x[1,1]*x[2,2]/(x[1,2]*x[2,1]) sigma <- sqrt(sum(1/x))
Za <- qnorm(1-alpha/2)
inf <- exp(log(theta)-Za*sigma) sup <- exp(log(theta)+Za*sigma) IC <- c(inf,sup)
return(list(theta=theta,sigma=sigma,IC=IC))
}
odds.ratio(tablamarg) woolf_test(tabla)
#Hombres
tabla.AB.1<-tabla[„1] tabla.AB.1 odds.ratio(tabla.AB.1)
#Mujeres
tabla.AB.2<-tabla[„2]
tabla.AB.2 odds.ratio(tabla.AB.2)
#MODELO
datoscasosmarg=as.data.frame(tabla)
saturado_loglm = loglm (formula= ~Sexo*Estudios*Discapacidad, data=tabla)
step (saturado_loglm, direction="backward", test="Chisq")
contrasts(datoscasosmarg$Estudios) = contr.treatment (2,2)
contrasts(datoscasosmarg$Sexo) = contr.treatment (2, 2)
contrasts(datoscasosmarg$Discapacidad) = contr.treatment (2, 2)
modelo.SDE.glm=glm(Freq~Sexo*Estudios*Discapacidad,family=poisson,
data=datoscasosmarg)
parametros_glm=modelo.SDE.glm$coefficients error_estandar_param=summary(modelo.SDE.glm)$coefficients[,2] ic = function(parametro, sigma, conf.level=0.95) {
inf=parametro-qnorm(0.5*(1+conf.
level))*sigma sup=parametro+qnorm(0.5*(1+conf.level))*sigma return(list(inf,sup))
}
tabla_resultados = function(est_parametros=parametros_glm, error_est=error_estandar_param){
estimaciones=vector()
exp_estimaciones=vector()
IC_estim=matrix(data=NA,nrow = length(est_parametros), ncol = 2) IC_exp_estim=matrix(data=NA,nrow = length(est_parametros), ncol = 2)
for(i in 1:length(est_parametros))
linebreak  estimaciones[i]=est_parametros[i] exp_estimaciones[i]=exp(est_parametros[i])
for(j in 1:2){
IC_estim[i,j]=ic(est_parametros[i],error_est[i],0.95)[[j]] IC_exp_estim[i,j]=exp(IC_estim[i,j])
}
}
return(data.frame(names(est_parametros),estimaciones, exp_estimaciones, IC_inf_est=IC_estim[,1], IC_sup_est=IC_estim[,2], IC_inf_exp_est=IC_exp_estim[,1], IC_sup_exp_est=IC_exp_estim[,2]))
```

Script de R 33

```
}
resultados_completa=tabla_resultados() resultados_completa.
```

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