Is Assortative Mating a Limitation for Intergenerational Mobility? : The Role of the Chilean Privatisation Educational Reform

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Abstract

This research analyses the effects of assortative mating on the level of intergenerational earnings dependency in the context of the Chilean educational reform implemented in the 1980s. It is found that assortative mating in terms of years of schooling explainsaround 20% of the intergenerational earnings dependency levels and that the educational reform increased the levels of assortativemating due to potential student sorting and a general increase inthe educational attainment of the whole Chilean population. In addition, it is found that individual father and father-in-law's earnings have a similar influence on an individual's earnings suggesting that people tend to match with people that are similar to their parents.

JEL codes: I20, I24, I28

Keywords: Assortative Mating, Social Mobility

1 Introduction

The way that couples are formed could play an active role in terms of reproducing levels of income between parents and their offspring. If richer and well educated individuals get married to similar individuals and similarly for poorer individuals, the socioeconomic condition of these individuals could be reinforced into the next generation. In particular, if people also reproduce their parents' socioeconomic condition, the level of homogenisation will help to perpetuate the level of inequality in society (Hirvonen, 2008). Therefore, there could exist a relationship between the level of association between the socioeconomic characteristics of couples, also called 'assortative mating', and the level of intergenerational mobility. This could become relevant for analysing one of the causes of the level of intergenerational mobility in societies, especially if it is considered that "the transmission of economic success across generations remains something of a black box" (pp. 2, Bowles and Gintis, 2002). In this respect, it is believed that if the level of assortative mating is high, intergenerational mobility will be lower, because if couples are not formed randomly in terms

of their education or income then the persistence and reproduction of their socioeconomic status in their children seems more likely.

Assortative mating and more specifically marital homogamy can be understood as the partnership between individuals of the same (or similar) social background, ethnic group or religious affiliation, or level of human capital (Birkelund and Heldal, 2003), among other things. Educational assortative mating seems to be one of the most important types because of the role that education plays in determining future earnings and socioeconomic situation (Schwartz and Mare, 2005). Non-random sorting among couples has been suggested as being a consequence of people's interaction in similar environments, where individuals meet people with similar interests, values and in many cases, with similar socioeconomic status (Kalmijn and Flap, 2001). Educational institutions have been mentioned to be one of the most important contexts where people meet and interact, in particular peer group effects would be very important in terms of influencing educational outcomes, creating social networks and as small clubs of individuals with high entry barriers. Hence, if an educational system is characterised by sorting of students by family background or income, or student ability, then the peer group will likely be homogenous and the members of potential couples formed in that environment will also be alike, as shown by Nielsen and Svarer (2006) for the case of Denmark who find that levels of educational assortative mating are due to individuals' opportunities in the marriage market.

The Chilean educational system has been suggested as being very segregated (Elacqua, 2009). In particular, it has been claimed that the 1980s Chilean educational reform was the one that exacerbated the levels of segregation among students, where children from better socioeconomic backgrounds are concentrated into voucher schools and poorer children into public schools, and that could be playing an important role in terms of the level of association between the characteristics of members of a couple. Furthermore, if it is considered that each member of a couple will bring their social networks to the partnership, then this could reinforce the segregation among individuals as they do not necessarily prefer a partner with a similar level of education, but they would like to secure a better social status through an homogeneous marriage (Blossfeld and Tim, 2003).

This paper presents a theoretical model that describes the impact that assortative mating on schooling could have on intergenerational mobility of earnings, as well as some empirical evidence in the context ofChilean society. In particular, the model developed for this research is based on several previous models such as Solon (2004), which describes the earnings dependency coefficient between child and parents in terms of earnings return to human capital, among other things, but not on the level of assortative mating among members of a couple.

In terms of empirical methodology, due to the lack of data on father's earnings, the Two Sample Two Stage Least Squares (TS2SLS) technique has been used to predict father's

earnings using two totally independent data sets and using years of schooling and occupation as its main predictors.

In addition, the impact of the Chilean 1980s educational reform has been analysed, comparing the level of assortative mating pre and post reform. This is particularly interesting as the reform was based on privatisation of the educational market and school competition, which could have created segregation among the students attending public schools and those attending the new voucher schools, leaving the poorest and most vulnerable in the former. It is important to notice, that this reform was implemented nationwide in 1980 and all municipalities in the country were affected unconditionally at the same time.

The following section of this paper discussesthe existing empirical evidence on the measurement of assortative mating and the role that it plays on the level of intergenerational earnings dependency. Next, a simple theoretical model is developed in order to establish a clear relationship between the levels of assortative mating among members of a couple in terms of schooling and the level of intergenerational earnings dependency. This model is used in the methodology section to explain how the levels of assortative mating and intergenerational earnings dependency will be calculated, and also presents an explanation for measuring the impact of the 1980s educational reform in Chile. Finally, results and conclusions sections are presented.

2Out of Sight, Out of Reach: Empirical Evidence

The empirical evidence related to assortative mating is plentiful in descriptive terms, considering that the levels of correlation between characteristics of members of couples has been analysed not only from the economics perspective, but is also commonly in sociological and psychological research. Torche (2010) finds that educational homogamy appears to be the rule in many Latin-American countries, finding that the proportion of couples with the same level of education corresponds to 60% in Brazil, 48% in Chile, and 50% in Mexico compared to 52% in the US. The change over time of this phenomenon has also been considered, with a general consensus that assortative mating has been increasing. In this respect, Bernardi (2003) analyses different levels of assortative mating in Europe concluding that in Italy, for example, levels of educational homogamy have increased over time, and Halpin and Chan (2003) propose the possibility that the change in the patterns of educational mating could be a result of the increase in women's participation in the labour market.

In addition,schools would be an ideal place to meet as students are normally homogeneous within them, normally with similar ages and there are usually similar numbers of girls and boys. Kalmijn and Flap (2001) point out that schools promote most of the types of couple homogeneity, finding that in the Netherlands 15% of couples attended the same school, findings similar to those of Laumann*et al.* (1994) who found that 23% of couples in the US attended the same school. On the other hand, the workplace could be a less favourable environment because people are more segregated by gender there and there is

lower female labour force participation. However, very few researchers have focused on the effect of educational reforms and the impact on assortative mating and intergenerational mobility.

In this respect, analysing the effect that assortative mating has on intergenerational mobility, Lam and Schoeni (1993), using a Brazilian working male sample, conclude that the schooling of an individual's parents-in-law has a larger effect on their earnings than the schooling of their own father. Chadwick and Solon (2002),who expand upon this idea, find that if the proportion of the household's earnings attributed to the man is higher, then the level of dependency between an individual and his parents-in-law will be higher as well, probably due to the fact that richer individuals fervently want to keep their social status. Similarly,Blanden (2005) analyses the relationship between assortative mating and intergenerational mobility for the case of Canada, concluding that a daughter's and her partner's income are influenced by her parent's income, suggesting that assortative mating tends to increase income persistence between generations, and finding that individuals that get married later in life seem to be more homogeneous in terms of parental income, and married couples are more homogeneous than those that are only cohabiting. Moreover, Ermisch*et al.* (2006), using British and German data, find that, on average, around 40-50% of the intergenerational income dependency between individual's and partner's joint income and that of the individual's parents is produced by the level of assortative mating in human capital.

Hence, this investigation expands upon the previous literature, presenting a clear causality effect (theoretically and empirically) of the levels of assortative mating between members of couples on the levels of intergenerational earnings dependency in Chile.In addition, and considering that the Chilean educational reforms of the 1980s could have provoked a change in the way that Chilean members of couples meet with each other, the effect of the reform on the level of assortative mating in society has also been analysed. This seems to be worth analysing as high levels of assortative mating in society could indicate a lack of interaction between people from different social groups, so it would be a good indicator of the level of social openness and integration (Birkelund and Heldal, 2003). Certainly, if marriage selection is random then intergenerational mobility will be higher. This would be particularly important in the Chilean context where the 1980's educational reform seems to have created higher levels of segregation between the socio-characteristics of students.

3 ATheoretical Model of Assortative Mating and Intergenerational Mobility

This section develops a simple model of the relationship between assortative mating and intergenerational earnings dependency. It has been considered that the education levels of members of a couple are positively correlated. It is clear that reality is much more complex than a simple model can try to represent, but for the purposes of simplicity, the main assumptions considered are:

- Individuals live 2 periods of time (t and t+1). In the former, parents consume part of their income and invest in their offspring's human capital. In the second period, their child is an adult and has his/her own household, earnings and a partner.

- Couples have only 1 child.

- Assortative mating is positive (more educated people mate with people of a similar educational level and vice versa for less educated people).

- Richer parents have the same level of altruism compared to poorer parents (it could be the case that richer parents face a social pressure for investing more in their children)[1].

The utility function of individual *i*'s parents depends on their own consumption at period *t* (c_{it}) and their child's future permanent household income (${y_{it+1}}^{Household}$). The proportion of concern between one and the other (understanding that for budget constraint reasons they will act as substitute goods) will be expressed as α (the level of altruism of parents), where $0 \leq \alpha \leq 1$.

$$(1)\quad {U^{Parents}}_{it} = (1-\alpha)\log(c_{it}) + (\alpha)\log({y_{it+1}}^{Household})$$

The total household permanent income of the child *i* when adult in *t+1* will be the joint individual permanent income (y_{it+1}) and his/her partner's permanent income (${y_{it+1}}^{P}$).

$$(2)\quad {y_{it+1}}^{Household} = y_{it+1} + {y_{it+1}}^{P}$$

Educational homogamy has been considered,because in general, women are part of the labour market in a small proportion, especially in the oldest cohorts, therefore this will be a more suitable factor for couples to match on than earnings (Birkelund and Heldal, 2003). Originally, the role of assortative mating is understood as the correlation between the human capital of the individual *i* (H_{it+1}) and the human capital of his/her partner (${H_{it+1}}^{P}$): $\rho = Corr(H_{it+1}, {H_{it+1}}^{P})$. However, this association between human capital held by the members of the couple will be interpreted as a selection process, where individuals who normally take human capital decisions before establishing a formal relationship (marriage or cohabitation) choose a partner with a relative homogeneity in human capital among the possible candidates in the "marriage market", which is supposed to exist as individuals compete to find their partners (Becker, 1973).

The aim is not to claim an unlikely causality between couple members' human capital (which could exist, in the sense that many individuals could meet at university for example and decide to extend their undergraduate studies to masters or doctorate degrees simply

[1] Mulligan (1997) suggests the possibility that altruism could be influenced by the economic status of parents.

because their partner decided to do so), but simply to represent the process of picking up a partner with similar educational characteristics (human capital will be understood as the level of education, more specifically as the number of years of schooling of individuals). The benefits in terms of schooling due to marriage will therefore depend on the decision of other individuals, who also have to decide how much schooling to achieve. Nevertheless, because most of the schooling decisions effectively take place before marriage, potential partners cannot agree on their levels of investment in education, so they take their decision considering that it may affect their choice in the future as regards their appropriate partner (Chiappori*et al.*, 2009).

Unmarried men and women interact in a marriage market, where individuals consider different characteristics of their potential partners. A potential wife's human capital would be attractive for men because it could give husbands access to wider networks and they can be useful in terms of a husband's career (Kalmijn, 1998). Therefore, the level of assortative mating will be represented by Ω_1, or how much influence the human capital of the partner has when the individual chooses them over other potential partners (in the same spirit as Ermisch *et al.* (2006)).

$$(3)\quad {H_{it+1}}^{P} = \Omega_0 + \Omega_1 H_{it+1} + {\omega_{it+1}}^{P}\ ,\ \Omega_1 > 0 \quad \text{(positive assortative mating)}$$

In equation (3), ${\omega_{it+1}}^{P}$ represents the other factors that influence the matching process decision (other factors that affect the partner's decision of acquiring more human capital).

In addition, the human capital of an individual plays an important role in determining the level of earnings, so the earnings of the individual *i*'s household would be mostly determined by their own human capital and their partner's human capital.This will be represented in a semi-logarithm earnings function in equation (4), where ρ_1 and ρ_2 represents the individual *i's* and their partner's returns to education respectively, assuming that there is a disparity between returns to human capital for men and women[2]. It is also believed that "husband's wage and wife's education are positively correlated, because maybe a wife's education contributes to her husband's earnings, as mothers' education contributes to her children's earnings." (Becker, 1973), therefore a partner's human capital would have a double effect: Increasing the household's earnings through their own earnings and increasing the household's earnings through his/her spouse's earnings.

$$(4)\quad \log({y_{it+1}}^{Household}) = \rho_0 + \rho_1 H_{it+1} + \rho_2 {H_{it+1}}^{P}$$

[2] Specifically for the case of Chile, the returns to years of schooling for female individuals are higher (9.4% per year of schooling) than for male individuals (8.2% per year of schooling) according to Psacharopoulos and Chu Ng (1992).

A traditional budget constraint for parents is considered, assuming that they divide their income (or earnings) between their own consumption and the amount of monetary resources invested in their child's human capital (τ).

$$(5)\quad y_{it} = c_{it} + \tau_{it}$$

Following Solon (2004), the technology that translates the parental investment (private investment) and public investment in education (G_{it}) into their child's human capital is represented by equation (6), where $\theta > 0$ is considered to obtain positive marginal productivity of human capital and μ_{it} corresponds to the child's attributes which are solely influenced by nature.

$$(6)\quad H_{it+1} = \theta \log(\tau_{it} + G_{it}) + \mu_{it+1}$$

Additionally, to include the child's endowment dependency with his/her parents endowment, equation (7) represents a first-order autoregressive process (AR), where λ represents the heritability coefficient between parents and their offspring.

$$(7)\quad \mu_{it+1} = \delta + \lambda\mu_{it} + \nu_{it+1}$$

In order to maximise the utility function described in equation (1), it has been left in terms of parents' investment as this will represent a decision made by the parents. Therefore replacing equation (4) and (5) in the utility function (1):

$$(8)\quad {U^{Parents}}_{it} = (1-\alpha)\log(y_{it} - \tau_{it}) + \alpha(\rho_0 + \rho_1 H_{it+1} + \rho_2 {H_{it+1}}^{P})$$

Replacing (3) and (6) in (8):

$$(9)\quad {U^{Parents}}_{it} = (1-\alpha)\log(y_{it} - \tau_{it}) + \alpha(\rho_0 + \rho_1[\theta \log(\tau_{it} + G_{it}) + \mu_{it+1}] + \rho_2[\Omega_0 + \Omega_1[\theta \log(\tau_{it} + G_{it}) + \mu_{it+1}] + {\omega_{it+1}}^{P}])$$

To obtain the family investing behaviour, the utility function in (9) is maximised. Therefore, the first order condition involves:

$$(10)\frac{\partial {U^{Parents}}_{it}}{\partial \tau_{it}} = \frac{-(1-\alpha)}{y_{it}-\tau_{it}} + \frac{\alpha\rho_1\theta}{\tau_{it}+G_{it}} + \frac{\alpha\rho_2\Omega_1\theta}{\tau_{it}+G_{it}} = 0$$

Obtaining the optimal level of private (parental) investment in human capital of their child:

$$(11)\,{\tau_{it}}^{*} = \frac{y_{it}\theta\alpha(\rho_1+\rho_2\Omega_1)-(1-\alpha)G_{it}}{[1-\alpha+\alpha\theta(\rho_1+\rho_2\Omega_1)]}$$

Therefore, it is possible to see that parental investment would depend on their income (y_{it}), their level of altruism (α), the technology that translates public and private investment into human capital (θ), the returns to education of the members of the couple (ρ_1 andρ_2), the government spending on education (G_{it}) and the level of human capital assortative mating (Ω_1). This last effect is positive, therefore an increase in the level of homogeneity in human capital increases how much parents invest in their child's education.

Taking into account equation (4), the implication given by the optimal level of private investment in human capital in equation (11) would imply:

(12)

$$\log({y_{it+1}}^{Household}) = \gamma + (\rho_1 + \rho_2\Omega_1)\theta \log(y_{it} + G_{it}) + \epsilon_{it+1}$$

Where $\gamma = \rho_0 + \rho_2\Omega_o + (\rho_1 + \rho_2\Omega_1)\theta \log\left(\frac{\theta\alpha(\rho_1+\rho_2\Omega_1)}{[1-\alpha+\alpha\theta(\rho_1+\rho_2\Omega_1)]}\right)$

and

$$(13) \quad \epsilon_{it+1} = \mu_{it+1}(\rho_1 + \rho_2\Omega_1) + \alpha\rho_2{\omega_{it+1}}^{P}$$

It is important to note that ϵ_{it+1} corresponds to the sum of an autoregressive process or AR(1), μ_{it+1}, and a white noise error ${\omega_{it+1}}^{P}$ which is equal to an AR(1) process (see Granger and Morris (1976)).

Re-writing equation (12):

$$(14)\ \log({y_{it+1}}^{Household}) = \gamma + \theta(\rho_1 + \rho_2\Omega_1)\log(y_{it}\left(1 + \frac{G_{it}}{y_{it}}\right)) + \epsilon_{it+1}$$

It is assumed that the ratio $\frac{G_{it}}{y_{it}}$ is small, i.e. that the public investment in education per child *i* at time *t* should be smaller than the child i's parents' permanent income. So, Taylor's approximation can be used:

$$(15)\ \log({y_{it+1}}^{Household}) = \gamma + \theta(\rho_1 + \rho_2\Omega_1)\log(y_{it}) + \theta(\rho_1 + \rho_2\Omega_1)\frac{G_{it}}{y_{it}} + \epsilon_{it+1}$$

In addition, following Solon (2004), an empirical social policy implementation is utilised, which will be described as a "Policy Rule":

$$(16) \qquad \frac{G_{it}}{y_{it}} = \delta - \sigma\log(y_{it}) \text{ , with } \quad 0 < \sigma < 1$$

Using this policy rule, if σ is more positive, the largest effect of the policy would be that on the income of children from low income families. Therefore, σ corresponds to the degree of progressivity of the education policy (Holmlund, 2008). The idea is that if σ is

larger, the $\frac{G_{it}}{y_{it}}$ ratio is smaller, which means that the relationship between government spending on education and parental income will decrease or that government spending will be lower when parental income increases.A higher public spending on education will increase intergenerational income mobility as the higher resources will benefit poorer children more than richer children, that is because richer children will be able to get a high level of education with or without public investment (because their parents can increase their private investment)

Taking equation (16) and replacing it into equation (15):

(17)

$$\log({y_{it+1}}^{Household}) = \varphi + \theta(\rho_1 + \rho_2\Omega_1)(1-\sigma)\log(y_{it}) + \epsilon_{it+1}$$

With (18) $\varphi \cong \gamma + \theta(\rho_1 + \rho_2\Omega_1)\delta$

Therefore, the intergenerational earnings dependency coefficient (between a parent's permanent earnings and their child's household earnings), using equation (17) is: $\mu = \theta(\rho_1 + \rho_2\Omega_1)(1-\sigma)$. It depends on the technology that translates investment into human capital (θ), the returns to education (ρ_1, ρ_2), the progressivity of the educational policy (σ) and the level of assortative mating (Ω_1). However, it is interesting to note that intergenerational dependency does not depend on the levels of parental altruism. A simple interpretation of this coefficient is that when the educational policy progressivity increases (when a larger proportion of the public spending on education goes to poorer families) the level of intergenerational mobility increases (the intergenerational earnings dependency decreases) as would be expected. On the other hand, higher levels of earnings return to education would decrease intergenerational mobility. If technology translates human capital in a more efficient way, then the levels of intergenerational mobility also decrease. Finally, the level of human capital homogeneity among the members of the couple increases the level of earnings dependency between a child's household earnings and the child's parents' earnings. It is important to consider that even though assortative mating can take values equal to zero (Ω_1=0), intergenerational dependency will take values which are non-zero, depending only on the technology, the individual's earnings returns to human capital and the progressivity of the educational policy: $\mu = \theta\rho_1(1-\sigma)$. Also note that differences in the parameters of the model could make a difference in terms of the level of intergenerational mobility in countries.

Table 1 gives a summary of the direction of the effect that each factor has on the level of private investment in human capital and the level of intergenerational earnings dependency.

<Table 1 here>

4 Data

The data utilised for this research come from the cross-sectional National Socio-economic Characterisation Survey (CASEN) of 1990 and 2009, collected by the Ministry of Social Development of Chile. These surveys are used as the main source of information for social policy decisions. The data consist of information about households and individual characteristics in terms of education, occupation, income and living conditions and are suitable for analysing the effect that educational assortative mating has on intergenerational earnings dependency, but also for analysing the effect of the 1980s educational reform in Chile and its impact in terms of educational assortative mating among couples. The survey in 2009 is particularly interesting for the first analysis because it asked individuals for information about their parents when the individuals were 15 years old. The questions are related to educational level, occupation and age. However, the survey does not include information related to income or earnings of parents. Therefore, individuals in the 1990 survey are used as potential parents, respecting of course some restriction of age (not all individuals in 1990 could be parents of individuals in 2009 as they might have been too young or even too old). The sample in 1990 is therefore called 'the synthetic parents' sample.

As the synthetic father/parents survey of 1990 is totally independent of parents described by individuals in 2009, itis important to have a sample that is consistent in terms of age, the proportion of people with a determined level of education and the occupation that they describe. It is particularly important as earnings of parents will be predicted using these characteristics. Table 2 presents a comparison between the average age of male individuals' fathers reported by the individuals in 2009 and the average age of the synthetic fathers (reported by the fathers themselves in 1990). It is possible to see that the average age of fathers of male individuals in 2009 is 60 years old, which is the same average age of the synthetic fathers observed in 1990 (once the 19 years difference between surveys is allowed for). In addition, it is important to consider consistency between fathers of female individuals observed in 1990 and the ones reported by their daughters in 2009.In particular, this is relevant because the assortative mating relationship will include an analysis of the father-in-law of male individuals. Table 3 presents the average father's age in 2009, which is claimed by their daughters (partners of male individuals)and then compared to the age of the synthetic fathers in 1990.Again it is possible to see that these are very similar. The daughter's report now becomes important as the individuals' (son when adult) and their partners' (daughter when adult) earnings are considered to analyse the effect of intergenerational earnings dependency.

<Table 2 here>

<Table 3here>

The individuals' and their partners' age is also important, and should be consistent with the age of their parents, but also with the age that they would be in 1990, because that

year they are supposed to be 15 years old (as the survey asks individuals information about their parents at that age). Table 4 shows that the average age of sons in the 2009 sample was 34.53 years old; this figure should be congruent with the expected average age of sons if fathers in the 1990 sample are considered. That is, if the synthetic fathers in 2009 (the ones obtained using the sample in 1990 pushed forward 19 years) were on average 59.98 years old, then they were born in 2009-59.98=1949 and it is supposed that they have a child at the age of 25 years old (which was also checked as the most popular age on average to have children in the survey) then, the sons were born on average around 1949+25=1974. Therefore, sons in the year 2009 should be 2009-1974=35 years old, which is in fact the average age of children observed in 2009 (34.53). In addition, sons in 1990 were on average 16 years old, being consistent with the correspondent survey question. A similar consistency can be seen for daughters in Table 5.

<Table 4 here>

<Table 5 here>

Using the samples mentioned above, in total it is possible to find 4,926 male individuals and female partner and father pairs, 5,717 male individuals and fathers-in-law pairs; and 4,664 male individuals and female partner and parent pairs. In addition, when the role of the educational reform is considered, only the data of the year 2009 is utilised, using 47,825 couples between the ages of 25 and 90 years old. However, this sample is also restricted to compare closer generations of couples, limiting their age to between 40 and 55 years old, reducing the sample to 24,279 couples.

5 Methodology

One of the most important aims of this research is to analyse the effect that human capital assortative mating has on the level of intergenerational earnings dependency between a father's earnings (or parents') and their child's household's earnings. This follows the idea that parents that have higher incomes will invest a larger amount of resources on their offspring's human capital, allowing their children, when adults, to get better jobs and higher earnings, but also be able to choose a higher quality partner (a partner with higher human capital and potentially higher earnings too) reinforcing the pure human capital effect in terms of the level of association between parents' earnings and their child's household's earnings.

In terms ofassortative mating levels, the number of years of schooling of male individuals and their female partners has been considered (understanding marriage beyond legalisation, but as living in the same household as a couple) to analyse the effect of assortative mating on human capital. In addition, the effect of father-in-laws' earnings has been considered, analysing signs of preferences for similar partners in terms of background. Finally, the effect of the Chilean 1980 educational reform has been considered, in particular in terms of its effect on assortative mating.

5.1 The Impact of Assortative Mating on Intergenerational Mobility

In order to analyse the effect that assortative mating has on the level of intergenerational mobility in society, the level of intergenerational dependency between male individuals plus their partners' earnings and the fathers' (or parents') earnings has to be available. The main problem to estimate this intergenerational dependency is that, as was mentioned before, individuals in 2009 gave information related to education, occupation and age of their parents, but not their earnings.

Therefore, the Two Sample Two Stages Least Squares (TS2SLS) method, which allows the connection of two totally independent cross-sectional data sets, for this case 1990 and 2009, was used. The former will act as a synthetic fathers data set, being used in the first stage to predict fathers' earnings using their years of schooling, occupation and age as predictors. Then the second stage takes place using the second data set, the coefficients from the first stage and the information that in 2009 individuals give about their parents, which includes education, occupation and age, to produce a predicted level of earnings, y^{Father}, for each father in the 2009 data set. Individuals' household income was then regressed against this calculated fathers' earnings variable:

$$\ln(y_{it+1}^{Individual+Partner}) = \varphi + \mu \ln(y_{it}^{\hat{}Father}) + \xi_{it+1}^{Individual+Partner}$$

Where μ corresponds to the intergenerational earnings dependency between the individual's and partner's earnings and his father's predicted earnings. In the maincase, only male individuals are considered with their respective female partners, but the analysis also considers a case using female individuals with their respective male partners.

Finding the value of μ should be of interest by itself. However, one of the most important aims is actually to calculate how much assortative mating impacts the level of intergenerational dependency.

Hence, it is also necessary to estimate the level of assortative mating in society, understanding it as the level of dependency between the years of schooling of individuals and their partners (controlling for their age), estimated using OLS.

$$H_{it+1}^{Partner} = \Sigma + \Omega H_{it+1}^{Individual} + \omega_{it+1}^{Partner}$$

The first stage of this part of the analysis wasto create two bi-dimensional pairs of matrices, one containing 40 different cells with 40 different intergenerational earnings coefficients and the other containing 40 different cells with 40 different levels of assortativemating. The dimensions to create these matrices have been chosen with the

expectation that different levels for each cell will be obtained,hence creating variability in the two variables between the 40 cells. It is expected that intergenerational mobility could vary across age (because it could increase and/or decrease over time) and across the earnings distribution (as richer families could have tight mechanisms of social status reproduction, for example). Similarly, assortative mating could also vary with age (because the social structure that defines the marriage market could have been affected by specific social policies) and with the level of earnings of the members of a couple (as people with higher earnings are also probably more educated and have likely associated with people with similar levels of schooling).Four age cohorts and ten municipality earnings per capita deciles (considering first the earnings of male individuals in the household, but also the joint earnings of individuals and their partner) were originally utilised. In terms of the municipality earnings per capita deciles, they were derived for male individuals, with the average earnings per capita calculated for the municipality in which they live, so every individual in a municipality will have the same municipality earnings per capita, and then earnings deciles are calculated. For the assortative mating matrix, an individual's age and partners' age were used as control variables and the relationship estimated using the OLS technique. For the intergenerational earnings dependency matrix, the control variables considered were the individual's age, individual's age squared, partner's age, partner's age squared, individual father's age and individual father's age squared (using the OLS technique). In addition, the age cohorts only included individuals between 25 and 45 years old, because if they were too young they would not have earnings, and if they were too old, their parents would also be too old to consider their earnings or likely it will not even be possible to find them in the data available.

These dimensions were also modified to test the robustness of the results. For example, the addition of an extra dimension was considered, namely rural versus urban households.In that way 80 cells were obtained for the levels of assortative mating and for the intergenerational earnings coefficients. In addition, the municipality earnings deciles were replaced by the sectors of occupation in whichindividuals worked. Finally, both parents instead of just fathers were used to obtain the intergenerational earnings coefficients (for this case, the intergenerational earnings matrix in the first stage adds to the control variables the mothers' age and mothers' age squared).

Independent of the dimensions used to create the matrices, the value in each cell of the matrix of intergenerational earnings coefficients becomes an observation by itself, and each cell of the matrix of assortative mating becomes an observation onassortative mating. Then, a simple OLS equation (controlling for mean age of individuals, their partners and their fathers/parents obtained in each cell of the first stage) is estimated using these observations, calling it the second stage regression:

$$\mu_g = \psi\Omega_g + \nu_g$$

Where ψ corresponds to the change in the level of intergenerational earnings dependency that is produced by a change in the level of assortative mating in society[3] and g corresponds to the 40 observations created by 4 age cohorts and 10 earnings deciles for the baseline case. The estimation of this equation is weighted, taking as weights the number of observations that were used to calculate theassortative mating values (i.e. the cell sizes in the 40 cell matrix described above).

It is important to notice that the most important result of the previous regression will be the multiple coefficient of determination or R^2. When no control variables are included, the R^2 will measure how much assortative mating explains the level of intergenerational earnings dependency. However, when more control variables are considered (average per cell of individuals', partners'and fathers' age and age^2) R^2 needs to be re-considered, because it will by itself calculate the proportion of the variation in the response variable (intergenerational earnings dependency) that is explained by the whole model (which includesassortaitve mating and ages), therefore it would not measure the pure effect of assortative mating, which is the main interest (Acock, 2008).

The whole procedure described above has also been extended to the analysis of female individuals, their male partners and their fathers (and parents).

5.2 The Impact of the Educational Reform on the Level of Assortative Mating

In order to analyse the effect of the 1980's educational reform on the level of assortative mating (considering years of schooling), an OLS estimation is utilised, adding to the original estimation of assortative mating an interaction variable that considers years of schooling of the individualinteracted with a dummy variable that indicates if the individual was partly affected (at least one year of their education affected by the reform) and/or also fully affected by the reform, i.e the individual entered the new education system in the first year of primary education. Therefore, if it is considered that individuals enter primary education when they are 6 years old and leave secondary education when they are 17 years old, they will be fully affected by the reform if in 2009 they were younger than 36 years old and at least affected for one year if they are younger than 47 years old. Initially, the full sample of 2009 is utilised, but also a restricted sample (considering ages between 30 and 50) was used as 25 years olds are likely very different to 90 year olds, and so a narrow range of ages was used. In addition, individuals are separated depending on the highest levels of education they have achieved (primary, secondary or tertiary) and the effect of the reform is

[3] It would perhaps be interesting to analyse the effect of other factors (such as progressivity of social policy or returns to education mentioned in the theoretical model proposed previously), but it is not clear that these factors are going to vary by a pair of categories (dimensions). For example, it is not clear that progressivity of social policy will vary with age or by municipality per capita earnings.

evaluated taking this into account. In formal terms, the analysis of the effect of the educational reform is described below[4]:

$$Schooling_{Partner} = \alpha Schooling_{Individual} + \beta Dummy_{Affected} + \gamma Dummy_{Affected} * Schooling_{Individual}$$

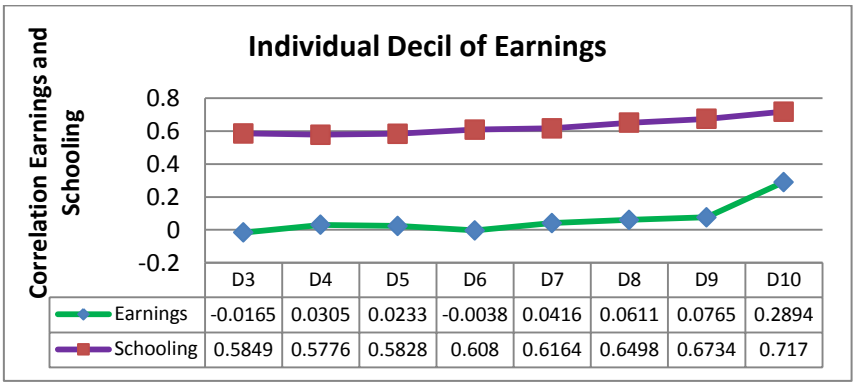
6 Results

6.1 Levels of Assortative Mating

The level of assortative mating in terms of years of schooling seems to be high in Chilean society (see Figure 1). In fact, considering the correlation among members of couples, the correlation in terms of years of schooling is higher (between 0.57 to 0.71) than in terms of earnings (between 0.0165 and 0.289). In addition, the correlation between individuals' earnings by deciles is clearly higher in thehigher deciles, particularly for the last deciles. This is surprising, as it was expected that many female individuals only study more to find a better husband, and that they do not enter effectively into the labour market. However, this does not seem to happen, probably due to the fact that the last decile of earnings is composed of individuals that are not the richest in the country but are probably upper-middle class and due to the empowerment of Chilean women, they believe that working not only gives them back their investment in education, but also gives them more bargaining power in the household. This could be related to the neoliberal reforms that Chile has experienced in the '70s and '80s, where many male workers lost their jobs in state companies and women felt forced to support their households in monetary terms which was also encouraged by the creation of some social programmes (Bosch, 1998). It is therefore possible, that younger couples have higher levels of earnings assortative mating than older couples (the correlation between members of a couple aged 35-40 years old is around 0.40 which is twice the correlation that couples aged 60-65 years old exhibit). On the other hand, in terms of schooling, the difference between poorer deciles and richer deciles is not very large (see Figure 1).

[4] The dummy variable, for the status of being affected by the reform, and the other control variables in the regressions, correspond to the individuals (males) instead of their partners. In any case, most of the couples have been affected equally by the reform (97% and 78% for partially and fully affected by the reform). Most of the couples have similar ages and also, even though the members of the couple may not meet at school, their networks influenced by the reform could help them find their partner, although the partner was not affected by the reform (because of their respective age gap).

Figure 1: Earnings and Years of Schooling Correlations by Individuals' Earnings Decile



	D3	D4	D5	D6	D7	D8	D9	D10
Earnings	-0.0165	0.0305	0.0233	-0.0038	0.0416	0.0611	0.0765	0.2894
Schooling	0.5849	0.5776	0.5828	0.608	0.6164	0.6498	0.6734	0.717

It has been suggested that these high levels of assortative mating (at least in schooling) are due to the educational reform implemented nationwide in the country in 1980, which was based on privatisation of the educational market and school competition.

6.2 Level of Intergenerational Earnings Dependency

Intergenerational earnings dependency seems to be high in Chile, around 0.458 when the relationship between fathers' and individuals' earnings is considered. This could be due to many factors, including the possibility that the Chilean educational reform increased the sorting among individuals and with that increased assortative mating in education of couple members.The idea that there could be a relationship between an individual's earnings and the corresponding father-in-law's earnings is taken into account which would also show the way in which assortative mating plays a role on the level of intergenerational mobility. That is, male individuals would have similar earnings to their own fathers, but also to their father-in-laws. Table 6 presents the levels of intergenerational dependency between an individual's and their father's earnings (column 1), and an individual's and partner's joint earnings and an individual's parents' earnings (column 2). On the other hand, the relationship between an individual's earnings and his father-in-law's and an individual's and partner's joint earnings and his parents-in-law are found in column 3 and 4 respectively. From these results it is possible to see that a father's earnings and father-in-law's earnings explain, to a similar degree, an individual's earnings (0.458 and 0.422 respectively). Similarly, an individual's and partner's joint earnings are also explained to a similar degree by the individual's parents' earnings and his parents-in-law (0.595 and 0.618 respectively). That could suggest that people find a partner with similar characteristics to their parents.

<Table 6 here>

6.3How the Educational Reform affected the Level of Assortative Mating

The 1980's Chilean educational reform, which has previously been claimed to have produced sorting among children and segregation of pupils depending on their social status

and parents' background, seems to have increased the levels of assortative mating in terms of schooling.These results are presented in Table 7.

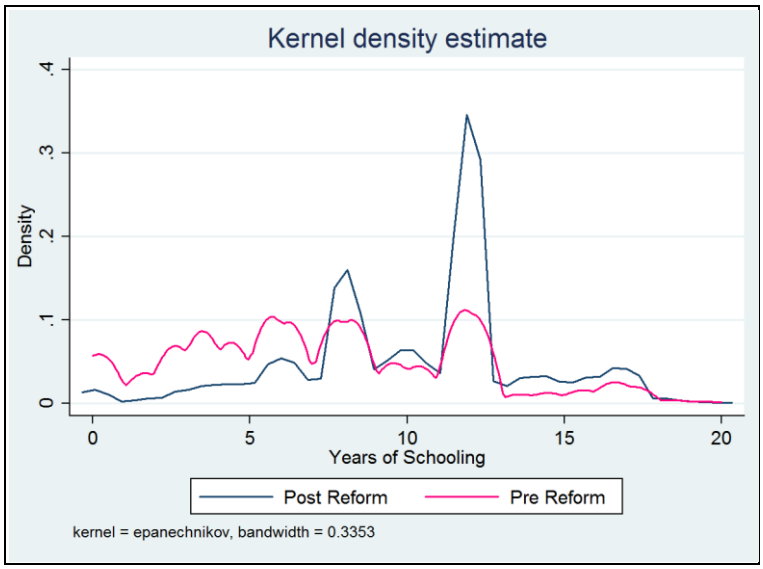
<Table 7 here>

The results seem to indicate that the educational reform has increased the levels of educational assortative mating at all of the levels of educational achievement. However, there is a possibility that in the segments that the educational reform increased the level of assortative mating, it was not due to segregation, but rather due to increasing the educational attainment of the whole population. If this is the case, more educated individuals would create a more homogenous society in terms of schooling, especially among the youngest (who were affected by the educational reform which increased sorting, but also increased the level of educational attainment, in particular for lower income individuals), that could be associated with an increase in assortative mating, but in a positive way, because everyone would have a similar level of education. Therefore, it would be useful to determine whether the higher levels of assortative mating observed amongst younger cohorts affected by the reform was due to increased segregation, or due to higher attainment leading to an increased homogenisation of educational performance.

Looking towards the bottom of the educational distribution should help us distinguish between the causes of the increase in assortative mating after the educational reform. If most individuals become more educated, it would be difficult for those that stay at low levels of education to find a partner with similar levels of education, and so the 'higher general attainment' effect would cause assortative mating to decrease in this section of the schooling distribution. On the other hand, if these lesser-educated individuals become more isolated from society and are unable to meet and interact with individuals with higher levels of education, assortative mating would increase in this part of the schooling distribution. In contrast, for highly educated individuals, if they become more segregated then assortative mating increases for them not only because of a larger proportion of similar, more educated people in society (increasing the number of potentially similar partners) but also because they become more isolated from lesser-educated individuals, reinforcing the former effect, so leaving us unable to distinguish between the two effects in this section of the schooling distribution when using the same analysis as for lesser educated individuals.

It was first checked whether the distribution of attainment did change after the reforms. Therefore, the distribution of years of schooling between individuals who were affected by the reform and those who were not affected was analysed. Figure 2 presents the distribution of years of schooling among the two groups - the young, or those that have been affected by the educational reform,, and the older generations, who were not affected by the reform.

Figure 2: Pre- and Post- Reform Years of Schooling Distributions



Both distributions have been tested to check their similarity using the Two-sample Kolmogorov-Smirnov test for equality of distribution functions, rejecting the null hypothesis of equality in distribution (p-value>0.000). It is possible to see that the reform is associated with a change in the distribution of education in society. What is of more interest for the analysis here is whether or not the post-reform distribution was more homogenous than the pre-reform one (more people achieved a higher level of schooling), giving a positive indication of why the reform increased assortative mating levels. This is what actually seems to be happening: the post-reform distribution of years of schooling is more homogenous than the pre-reform one, which can be seen in the figure above, where obvious peaks are seen, which indicates that there are more young individuals with 12 years of education (finished secondary education) than amongst older individuals in the same situation. The same situation is observed for those with 8 years of schooling (finishing primary education). On the other hand, there are fewer individuals affected by the reform that have lower levels of schooling than individuals that were not affected by the reform. This could sound positive in terms of giving new generations more opportunities and hopes in life. However, it could be possible that the reform caused, as mentioned previously: a) a general increase in the level of education of the whole population, but also b) a higher level of segregation of people that have a lower level of education from those that obtained higher education, as mentioned previously.

The analysis above only considers male individuals, therefore it would not be complete without considering the change in the proportion of female individuals (which in the previous analysis were considered as partners) achieving different levels of education pre- and post- reform. This is imperative as the actual levels of assortative mating for a determined level of education will depend not only on the number of males available, but also the number of female individuals, as more men in one category will be meaningless if the number of females has been kept constant or has decreased. In Table 8, the proportion of female and male individuals at each level of education is presented for individuals partially

affected and not affected by the reform (the proportion of individuals is enough to represent the change in the number of female and male individuals as they are equal in number due to heterosexual couple's formation). First, it is important to check that the number of female individuals available does not restrict the possibility of matching. That is, if the increase of attainment of male individuals was not followed by an increase of attainment of female individuals, a higher number of males would not be possible to increase the level of assortative mating, if it is not followed by a similar increase in the number of females in the same category. Table 8 shows that the proportion and therefore the number of female individuals "available" for male individuals does not restrict the potential matches with similar individuals, that is, a similar proportion of female and male individuals are found in all the levels of education.

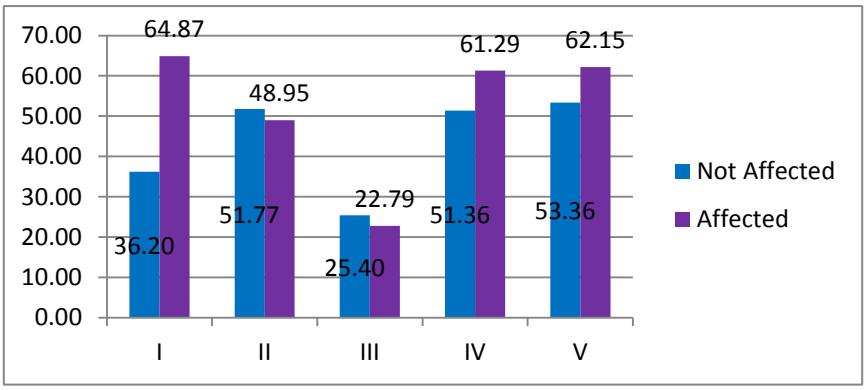
<Table 8 here>

Therefore, the main concern is to analyse if the change in assortative mating was or was not caused by social segregation or by an increase of educational attainment. As can be seen in the case of individuals that have primary education, they have decreased in number after the reform. This would suggest that assortative mating is reduced after the reform for individuals remaining with this level, because of fewer potential individuals to match with. However, in column 2 of Table 7, the results indicate that assortative mating increased for this level of education. Therefore, it is possible to say that it may be caused by an increase in segregation for lower educated individuals. On the other hand, in the case of individuals of secondary education, the number of male and female individuals increased after the reform. Therefore, it would be expected that the levels of assortative mating increased in this segment, which is confirmed in Table 7, column 3. Nevertheless, this increase in the level of assortative mating could be caused by more individuals able to match or because of an increase in the level of segregation.

To isolate the segregation effect, for the higher levels of education, and avoid the results being affected by the number of individuals with this level of attainment, an alternative is to divide the population into equal sized groups (chosen as quintiles), rather than into levels of attainment (so that the average attainment levels within quintiles will change over time). This is done in Figure 3, where quintiles of schooling of individuals and their partners have been compared before and after the reform (individuals partially affected have been considered). The results show that the proportion of males in the top quintile of the education attainment distribution, who married a woman in the same quintile, increased from 53% before the reform to 62% after the reform. This increase of assortative mating in the highest quintile of schooling could be produced by elitism and lack of contact with individuals of lower schooling. Therefore, the increase in assortative mating at the higher levels of education was likely produced by an increase in segregation of individuals, rather than by a pure effect of an increase of educational attainment. Figure 3 also shows that in the lower levels of education, particularly in the first quintile, the level of assortative mating has

almost doubled for individuals partially affected by the reform compared to those not affected by it. This shows that segregation is focused at the extremes of the schooling distribution.

Figure 3: % of Individuals in the Same Quintile of Years of Schooling as their Partner when Partially Affected/Not Affected by the Educational Reform at each Quintile of Schooling



In summary, couples from the cohorts of people born after the educational reforms seem to have a closer match of years of education, compared to those born before the reforms, with each year of additional schooling for the male partner being associated with a larger increase in his female partner's education. This seems to happen for all levels of education analysed. However, if the reform also increased the level of attainment of the whole population, lower levels of education would consist of fewer people and therefore, it would be more difficult to match in this category expecting therefore a decrease in assortative mating. However, the rate of matchingactually increased in this segment of attainment. Therefore, it is possible that the increase in educationmatching for this group after the reform was due to an increase in social segregation that forced lesser educated individuals together. On the other hand, at higher levels of education, more people are found after the reform, therefore the probability of matching with someone similar seems higher. This would be associated with an increase in assortative mating, which is actually happening. However, the increase in assortative mating can also be due to the possibility that higher educated individuals are not only greater in number, but also they are segregated from those that are less well educated, both effects will increase assortative mating. In order to separate these effects, a quintile analysis has been done, finding that individuals from higher quintiles (those with a higher education) are matched to highly educated individuals after the reform excluding the issue that more individuals are able to be matched with. Therefore, it is possible to suggest that higher educated individuals also experience segregation, which could be undesirable in terms of promoting fluidity in society.

We now move on to consider the effect of such assortative mating on the intergenerational earnings dependency.

6.4 The Effect of Assortative Mating on the Levels of Intergenerational Earnings Dependency

One of the most important aims of this research is to measure the impact that assortative mating in schooling has on the level of intergenerational earnings. This would be particularly important as it could help social policies to identify some of the determinants of intergenerational social dependency in society, and thuspotentially prevent higher levels of it. The dimensions of the matrix, each cell of which was used to provide an observation on assortative mating and intergenerational mobility, were varied in order to test the robustness of the results. One of the sets of dimensions used was the earnings per capita by municipality decile and the 4 age cohorts, providing 40 estimates of intergenerational earnings dependency between the father's earnings and the individual and his partner's joint earnings, and 40 estimates of assortative mating.

For this case, the second stage results indicate that the impact of assortative mating (in terms of schooling) on the levels of intergenerational earnings dependency seems to be around 20% as shown by the R^2 values when no control variables are included and by the same amount when age control variables are included (which correspond to the mean ages in each cell utilised in the estimation) as shown by the semi-partial R^2 (see column 1 of Table 9.) Thus, around 20% of the variation in intergenerational mobility across the cells of the matrix is explained by variation in assortative mating across the cells.

<Table 9 here>

In column 2 of Table 9, the level of intergenerational earnings dependency has been calculated using fathers' and mothers' joint earnings instead of only fathers' earnings, obtaining an impact of assortative mating of 21% on the level of intergenerational earnings dependency. In column 3 of Table 9, one of the dimensions used to calculate the different levels of assortative mating and earnings dependency is changed. In this case, the calculus of the earnings per capita by municipality has been done taking into account an individuals' and partners' joint earnings (not only individuals') and the intergenerational earnings dependency has been obtained using the parents' earnings instead of only the fathers' earnings. The proportion of the variance in intergenerational earnings dependency that is explained by differences in assortative mating for this case is around 16%, quite similar compared to the previous cases. Similar results are obtained when only the earnings dimension of the matrix definition is modified (column 4, Table 9) whilethe earnings dependency coefficients themselves are obtained using only the fathers' earnings (not parents).

In addition, a third dimension to estimate the first stage was tried, namely the rural or urban nature of the household where individuals and their partners live. The findings in the second stage in this case are that the influence of assortative mating is around 15%. Finally, other variants were considered to calculate the first stage of the estimation. When the earnings dimension is changed to industry of activity of individuals (including, agriculture, army, etc.) the impact that assortative mating has on the level of intergenerational earnings

dependency is between 12% and 15% (depending on whether control variables are considered or not). Previous results have considered male individuals and their female partners, and their relationship with the individuals' fathers' earnings. When female individuals and their male partners are considered, the effect of assortative mating seems to be lower than when male individuals are used. For example, in the female version of column 1 of Table 9, an impact of assortative mating of 19% is observed (versus a 24.6% effect for the male variant).

7 Conclusions

This research presents a theoretical model that shows the potential effect of educational assortative mating on intergenerational earnings mobility. When, this model is tested empirically, it considers that a proportion of the variance in intergenerational earnings dependency is explained by the level of assortative mating in terms of schooling. The findings suggest that the assortative mating effect is around 20% (when male individuals and their female partners are considered), which implies an important effect on how individuals match with their partners through education and how that could help reproduce the socio-economic background of the couple, and reinforce the earnings relation of an individual's household and their parents' earnings.

In addition, it is interesting to see that the father's and father-in-law's earnings have a similar influence on the earnings of individuals, which could be suggesting assortative mating in society, where individuals match with individuals that are similar to their parents. The effect of the 1980's Chilean educational reform is analysed, finding that it has increased the level of educational assortative mating among members of couples: if individuals have been affected by the educational reform the schooling of their partner increases by 0.031 years more for each additional year of their own schooling. These results give some support to the idea that the Chilean educational reform produced sorting among students, leaving the students with better social conditions (those with more parental support and with greater chances to achieve high levels of education) separated from those with lesser chances to progress in life. However, the effect of the reform might not only be associated with sorting, but also with the fact that the reform increased educational attainment, also increasing the apparent level of assortative mating, as the whole population would increase in terms of educational level achieved because different levels of attainment would produce different structural opportunities for individuals at each level to meet a similar partner. Therefore, if educational attainment increases over time, it could mean that younger cohorts would be more homogeneous in terms of education simply due to the general increase in the educational attainment of the whole population. Furthermore, if education allows poorer individuals access to tertiary education, the potential contact between children from different backgrounds would also increase intergenerational income mobility (Blossfeld and Tim, 2003). Nevertheless, a higher opportunity of meeting people from different backgrounds does not necessarily decrease prejudice in society, hence they might not effectively meet, as in many cases within higher educational institutions, people only interact in groups by considering their socioeconomic status.

Finally, the results presented seem to suggest that educational reforms could be very important in order to establish the rules through which people find their partners, considering that they allow for new generations to meet and to interact among themselves, the structure of educational systems would be essential to build a more open society, with more opportunities for people, but also to build a society where education not only means a degree, but also the understanding that people should be considered by their achievements and not by their parents' status.

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Table 1. : Summary of Effects on Private Investment in H.C and Intergenerational Earnings Dependency

Variable	Effect
Private Investment in Human Capital (τ)	α : +
	θ : +
	ρ_1, ρ_2: +
	Ω_1: +
Intergenerational Earnings Coefficient (μ)	σ: -
	θ : +
	ρ_1, ρ_2: +
	Ω_1 : +

Table 2: Father's Age in 2009 (reported by sons) versus 1990

Age of Father in 2009			
2009 (reported by sons)		1990 (synthetic fathers)	
t=0		t1=t+19	
Mean Age	59.98	Mean Age	59.7
Min Age	40	Min Age	44
Max Age	68	Max Age	84
St Dev.	5.93	St Dev.	11.45

Source: CASEN Surveys, 2009 and 1990

Table 3: Father's Age in 2009 (reported by daughters) versus 1990

Age of Father in 2009			
2009 (reported by daughters)		1990 (synthetic fathers)	
t=0		t1=t+19	
Mean Age	58.89	Mean Age	57.46
Min Age	40	Min Age	34
Max Age	73	Max Age	102
St Dev.	6.75	St Dev.	8.66

Source: CASEN Surveys, 2009 and 1990

Table 4: Son's Age

Son's Age in 2009	
Mean	34.53
Min	25
Max	56
St Dev.	5.86

Source: CASEN Survey, 2009

Table 5: Daughter's (Partner) Age

Daughter's Age in 2009	
Mean	32.11
Min	15
Max	57
St Dev.	6.66

Source: CASEN Survey, 2009

Table 6: Intergenerational Earnings Dependency including Father and Parents-in-Law.

Y=	Ln_Y_Individual	Ln_Y_Individual&Partner	Ln_Y_Individual	Ln_Y_Individual&Partner
	(1)	**(2)**	**(3)**	**(4)**
	coef/se	**coef/se**	**coef/se**	**coef/se**
ln_Income_Father	**0.458*** **			
	(0.026)			
ln_IncomeFatherLaw			**0.442*** **	
			(0.024)	
ln_IncomeParents		**0.595*** **		
		(0.025)		
ln_IncomeParentsLaw				**0.618*** **
				(0.025)
age	0.079***	0.027	0.076***	0.034*
	(0.020)	(0.024)	(0.016)	(0.019)
age_Sq	-0.001***	-0.000	-0.001***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
age_Partner		0.090***		0.087***
		(0.015)		(0.016)
age_Partner_sq		-0.001***		-0.001***
		(0.000)		(0.000)
age_Dad	0.029	0.024		
	(0.035)	(0.035)		
age_Dad_sq	-0.000	-0.000		
	(0.000)	(0.000)		
age_Dad_Partner			0.014	-0.038*
			(0.015)	(0.021)
age_Dad_Partner_sq			-0.000	0.000**
			(0.000)	(0.000)
age_mum		0.003		
		(0.017)		
age_mum_sq		-0.000		
		(0.000)		
age_Mum_Partner				0.032**
				(0.015)
age_Mum_Partner_sq				-0.000
				(0.000)
_cons	5.013***	2.960***	5.593***	3.493***
	(0.974)	(0.953)	(0.554)	(0.614)
Number of observations	4,890	4,664	5,485	5,267
R2	0.098	0.151	0.087	0.144
note: *** p<0.01, ** p<0.05, * p<0.1				

Table 7: Effect of the 1980's Chilean Educational Reform on Assortative Mating Levels

Y=Partner' Schooling	**Partially**				**Fully**			
	Total	**Primary**	**Secondary**	**Tertiary**	**Total**	**Primary**	**Secondary**	**Tertiary**
	coef/se	**coef/se**	**coef/se**	**coef/se**	**coef/se**	**coef/se**	**coef/se**	**coef/se**
Individual' Schooling	0.580***	0.455***	0.643***	0.572***	0.576***	0.450***	0.643***	0.576***
	(0.004)	(0.009)	(0.021)	(0.041)	(0.004)	(0.008)	(0.018)	(0.031)
Individual's age	0.028***	0.032***	0.019***	-0.029***	0.029***	0.035***	0.020***	-0.030***
	(0.002)	(0.003)	(0.004)	(0.008)	(0.002)	(0.002)	(0.003)	(0.007)
age_Partner	-0.091***	-0.113***	-0.063***	-0.017***	-0.091***	-0.113***	-0.063***	-0.017***
	(0.002)	(0.002)	(0.003)	(0.006)	(0.002)	(0.002)	(0.003)	(0.006)
Individual's Earnings	0.025***	0.053***	0.042***	0.004	0.025***	0.055***	0.043***	0.004
	(0.002)	(0.007)	(0.004)	(0.003)	(0.002)	(0.007)	(0.004)	(0.003)
Earnings_Partner	0.166***	0.242***	0.219***	0.112***	0.166***	0.245***	0.219***	0.112***
	(0.005)	(0.013)	(0.009)	(0.007)	(0.005)	(0.013)	(0.009)	(0.007)
Married	0.399***	0.263***	0.462***	0.556***	0.410***	0.283***	0.488***	0.551***
	(0.032)	(0.048)	(0.048)	(0.097)	(0.033)	(0.048)	(0.049)	(0.099)
affected1980_Partially	0.315***	0.310**	0.742*	0.591				
	(0.082)	(0.132)	(0.385)	(0.861)				
schooling_Affected_Partially	**0.031*** **	**0.049*** **	**0.056***	**0.038**				
	(0.007)	(0.018)	(0.033)	(0.053)				
affected1980_Fully					0.711***	0.938***	1.546***	1.067
					(0.125)	(0.238)	(0.522)	(0.950)
schooling_Affected_Fully					**0.056*** **	**0.094*** **	**0.116*** **	**0.066**
					(0.011)	(0.033)	(0.045)	(0.060)
_cons	5.993***	7.518***	4.284***	5.969***	5.935***	7.345***	4.209***	5.966***
	(0.111)	(0.164)	(0.299)	(0.713)	(0.086)	(0.129)	(0.252)	(0.514)
Number of observations	46,928	23,692	18,372	4,864	46,928	23,692	18,372	4,864
R2	0.551	0.364	0.197	0.194	0.551	0.364	0.198	0.194
note: *** p<0.01, ** p<0.05, * p<0.1								

Table 8: Percentage of Male and Female Individuals by Level of Education, Affected (R=1)/Not Affected (R=0) by the Reform[5]

Level of Education	R=1 (male)	R=0 (male)	Delta Male	R=1 (female)	R=0 (female)	Delta Female	Expected AM	Estimated on Table 4.8	Explanation
No Education + Primary Not Completed/Completed	35.57	61.77	-26.2	34.27	64.16	-29.89	-	+***	Sign of Segregation, fewer Male individuals (and female), but AM increased
Not Completed/Completed Secondary, Not Completed/Completed Vocational	50.57	30.5	20.07	52.28	29.18	23.1	+	+*	Double Effect: A) More People in this category therefore AM incresed B) More segregation
Not Completed/Completed Tertiary	13.86	7.74	6.12	13.46	6.66	6.8	+	+	Double Effect: A) More People in this category therefore AM incresed B) More segregation, but Not Siginificant

[5] The very insignificant change in the proportion of females and males in each educational category was preliminarily thought to have left the levels of assortative mating unchanged pre- and post- reform. However, similar proportions of male and female individuals only ensured that they could potentially match, but not that they will in fact match.

Table 9: Estimation of Assortative Mating on Intergenerational Earnings Dependency (Including Control Variables)

Using Assortative Mating Weights				
	1st stage uses Individual Earnings (A. M) & uses Individuals and Father's Earnings (I.M)	1st stage uses Individual Earnings (A. M) & uses Individuals and Parents's Earnings (I. M)	1st stage uses Individual and Partner Joint Earnings (A. M) & uses Individuals and Parents' Earnings (I.M)	1st stage uses Individual and Partner Joint Earnings (A. M) & uses Individuals and Father's Earnings (I.M)
	(1)	**(2)**	**(3)**	**(4)**
	coef/se	**coef/se**	**coef/se**	**coef/se**
Assortative Mating	1.336***	1.399***	1.159***	1.073***
	(0.027)	(0.032)	(0.029)	(0.026)
Age	-0.442***	-0.574***	0.144***	0.554***
	(0.027)	(0.035)	(0.039)	(0.034)
Age_Partner	0.850***	0.893***	-0.093***	-0.208***
	(0.033)	(0.038)	(0.033)	(0.033)
Age_Dad	-1.160***	-1.639***	-2.555***	-1.357***
	(0.087)	(0.142)	(0.093)	(0.082)
Age_Mum		0.473***	1.760***	
		(0.083)	(0.085)	
Age_sq	0.006***	0.007***	-0.001*	-0.008***
	(0.000)	(0.001)	(0.001)	(0.001)
Age_Partner_sq	-0.014***	-0.014***	0.001**	0.003***
	(0.000)	(0.001)	(0.001)	(0.001)
Age_Dad_sq	0.010***	0.014***	0.021***	0.011***
	(0.001)	(0.001)	(0.001)	(0.001)
Age_Mum_sq		-0.003***	-0.016***	
		(0.001)	(0.001)	
_cons	27.730***	28.814***	25.183***	34.915***
	(2.201)	(2.758)	(2.435)	(2.122)
N. Obs Total	6,711	5,312	6,711	6,711
R2	0.338	0.427	0.345	0.295
N. Observations	40	36	40	40
SemiPartial R2[6]	**0.2457**	**0.2128**	**0.1613**	**0.1789**
note: *** p<0.01, ** p<0.05, * p<0.1				

[6]Semi-Partial R^2 of the Assortative Mating variable.