

**Intergenerational Transmission of Educational Attainment:  
Evidence from Switzerland on Natives and Second Generation Immigrants**

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This study applies rich data from a recent Swiss census to investigate the intergenerational transmission patterns for natives and second generation immigrants. The level of secondary schooling attained by youth aged 17 is compared to their parents' schooling using data on the entire Swiss population. Based on economic theories of child educational attainment we derive hypotheses regarding the patterns in intergenerational education transmission. We first describe the educational attainment of various population groups and then test in a multivariate framework for significant differences across groups. The data yields that intergenerational transmission varies substantially across population groups.

Keywords: intergenerational transmission, educational attainment, second generation immigrants

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## 1. Introduction

We know that child educational outcomes are affected by their parents' characteristics. Are such patterns of intergenerational transmission of education features of education systems or do they differ across population groups under given educational institutions? This study answers this question based on evidence from Switzerland, where intergenerational educational mobility is particularly low.

This explicit focus on heterogeneity in intergenerational education transmission is new to the education literature. While studies of educational attainment acknowledge the relevance of parental background they do not discuss the potential heterogeneity in education transmission. Existing studies on the educational attainment of immigrants hardly compare the role of parents across population groups.<sup>1</sup>

The importance of parental characteristics is stressed by Belzil and Hansen (2003), who find that family background variables account for up to 85 percent in the explainable variation in child school attainment. If - in response to such evidence - educational policy intends to support educational mobility it must know whether the observed patterns are due to characteristics of educational institutions or of certain population groups.

The OECD's study on pupils' educational outcomes (PISA) yielded that across 31 participating countries the impact of parent socioeconomic status on child educational outcome was nowhere as large as in Switzerland (OECD 2002). Thus, by international comparison, the Swiss educational system appears to favor the children of the better off. Typically the offspring of immigrants are not in that group and yet the economic impact of immigration depends on the adjustment process of these youths. So it is important, whether differential intergenerational

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<sup>1</sup> Among the few exceptions are Gang and Zimmermann (2000), van Ours and Veenman (2003), and Nielsen et al. (2003). While the former find no impact of parental human capital for children of immigrants, Ours and Veenman conclude that natives and immigrants do not differ in intergenerational educational transmission. Nielsen et al. (2003) suggest that second generation immigrants in Denmark are educationally more mobile than natives.

mobility provides a bridge to allow disadvantaged children of immigrants to catch up with natives.

To answer the question of whether there are significant differences in the rate of intergenerational educational transmission and in educational upward mobility between population groups, we use the year 2000 population census of Switzerland which covered the entire population of 7.5 million individuals. For several reasons, Switzerland is a particularly interesting country to look at: First, it has a large population share of immigrants: as of 2000 21.3 percent of the Swiss population were foreign born and a similar share did not have the Swiss nationality. Second, Swiss educational policies are run by 26 regional administrative units, the cantons, which can be grouped by geographic or language region. While the educational institutions are similar across cantons, detailed regulations do differ.

Besides describing the heterogeneity in education transmission across population groups we test whether the predictions of models of educational attainment also hold for educational mobility: Are higher cost of education correlated to lower mobility, can we find a quantity-quality tradeoff parents face when it comes to investment in their children, and, finally, do country of origin characteristics and ethnic capital affect the heterogeneity in mobility, where e.g. upward mobility of second generation immigrants from disadvantaged countries is particularly high yielding a catch-up effect.

In section two we discuss our hypotheses, describe the secondary education system in Switzerland, and comment on the country's recent immigration history. After describing data and empirical approach in section three, we present our results: Intergenerational transmission is lower and educational mobility is therefore higher among second generation immigrants as compared to natives; surprisingly, mobility is higher in rural or less densely populated regions; mobility of men exceeds that of women and, surprisingly, the number of siblings does not affect the probability of exceeding parental educational attainment. In the sample of second generation

immigrants, we find catch up effects as females' chances of attaining high levels of educational degrees are higher than males' given their parents' education. Also, we find significant differences in educational attainment probabilities if immigrants who originated in countries with lower average levels of educational attainment as e.g. reflected in illiteracy rates. We conclude with a discussion of potential determinants of intergenerational educational transmission and the directions of future research.

## **2. Immigration to Switzerland, Education System, and Hypotheses**

*Immigration to Switzerland:* Topped only by Luxembourg, Switzerland has the highest population share of foreigners in the OECD (OECD 2004). The origins of this high share reach back to the 1950s and 1960s when Switzerland - similar to other European countries - attracted foreign workers to solve its labor shortage problems. Already then Swiss immigration law differentiated between seasonal workers, workers with annual permits, and permanent immigrants. Seasonal workers who return to Switzerland regularly could obtain annual permits and holders of annual permits who had stayed in Switzerland for five years could apply for permanent permits. In contrast to seasonal workers, holders of longer permits could move freely within Switzerland and they could bring their families. Therefore over time many former seasonal workers acquired rights to stay in Switzerland.<sup>2</sup>

In addition to these guest workers who typically arrived from southern Europe, Switzerland has always attracted highly skilled foreign workers such: While only 30 percent of native employees had tertiary training in 2003, this held for 58 percent of all immigrants from northern and western Europe (BFS 2004b). In the early 1990s Switzerland received a significant number of refugees and asylum seekers which add to the current foreign born population.

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<sup>2</sup> The share of permanent residents in the foreigner population increased from about 10 percent in the early 1960s to 68 percent in 1990 and 72 percent in 2000 (BFS 2004a)

*Educational System:* The details of the Swiss education system vary between the 26 cantons. However, the general patterns are sufficiently similar across regions to justify an overall description. Children enter primary school typically between ages 5 and 7 and stay there for between 4 and 6 years. Subsequently, they move on to mandatory schools until they fulfill the minimum schooling of 9 years. In some cantons mandatory schools differentiate pupils able to follow a basic and those following an advanced program.

It is after these first 9 years at the age of 14-16 that pupils choose whether and how to continue their education.<sup>3</sup> They can continue their general education at Advanced Schools which after about 3 years grant the degree required for university studies. The vast majority takes up an apprenticeship which lasts between two and four years and prepares for a vocational career. Alternatively, there are a variety of vocational schools or general schools which either train for particular occupations or provide general training in preparation for later specialized schools. These vocational schools are heterogeneous in requirements and organization.

In this study we compare youth based on their education at age 17. At this point one can reliably determine which educational route an individual has taken: Some may have failed to complete mandatory school or do not take up further training immediately afterwards, some may be involved in apprenticeships or vocational schools, and the better students should be attending Advanced School. Within the cohort which left mandatory school in 2000, two years later 21 percent attended Advanced School, 64 percent were in apprenticeships, 4 percent had enrolled in special vocational schools, and 11 percent were not pursuing training (Hupka 2003).<sup>4</sup>

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<sup>3</sup> For a descriptive study of the transition after mandatory school see Amos et al. (2003).

<sup>4</sup> The author also presents the distribution across training pathways by socioeconomic status of the parents, where the differences are striking: Among the children of parents in the bottom quartile of the status distribution only 6 percent attend Advanced School, compared to 48 percent among children of parents in the top quartile. A comparison by migration status shows few differences between natives and second generation immigrants.

*Literature and Hypotheses:* Empirical studies of educational attainment are based on two related theoretical arguments. The first states that optimal schooling is attained when marginal costs and benefits of further education balance. The argument was first developed by Becker (1967), and is discussed in Sweetman and Dicks (1999). Chiswick (1988) applied it to the case of ethnic groups which may differ in their evaluations of marginal costs and benefits of education. The higher the marginal cost of education the less likely parents should make the investment.

The second theoretical approach argues that parents face an implicit tradeoff between the number of children and the amount of investment in each. Not controlling for parental income, Chiswick (1988) finds an inverse relation between school attainment and fertility across ethnic groups and suggests that the tradeoff may arise from different relative prices for the labor of different groups: Since children are more expensive when the demanded "child quality" increases and since the opportunity cost of caring for children increases for highly educated parents, they may substitute child quality for child quantity. This conclusion is supported by evidence on fertility and child educational attainment.<sup>5</sup>

Borjas (1992, 1994) presents a separate argument with respect to the determinants of child educational attainment. He emphasizes the role of ethnicity and introduces the concept of ethnic capital as an externality in a child investment model. Ethnic capital is modeled as the average skill level in the parent generation of a child's ethnic group. He finds that the skill of older compatriots of immigrant youth are positively correlated to youth educational attainment. Nielsen et al. (2003) do not find confirmation for such correlation patterns in their Danish data. Gang and Zimmermann (2000) use a rough measure of the size of the immigrant's ethnic group and - unlike Riphahn (2004) who uses a similar approach - find a positive correlation between the size of an ethnic group at the time the youth was aged 6 and the young immigrants' subsequent educational

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<sup>5</sup> See Chiswick (1988), Sweetman and Dicks (1999), or Ermisch and Francesconi (2001). The latter find the negative sibling effect even when controlling for parental income and household wealth.

attainment.

We extend all three of these approaches, the optimal schooling model, the quantity-quality rationale, and the ethnic capital hypothesis to the analysis of intergenerational educational mobility. Parents for whom child education is more costly should demand less of it. In periods of educational expansion - such as the last decades - the increase in educational attainment should be more pronounced among those with lower education costs. As we expect the cost of attending Advanced School to be higher in rural areas where better schools may be harder to reach we also expect less educational upward mobility there compared to urban regions. Since the opportunity cost of education are lower when unemployment is high we expect higher participation in higher education also for given parental schooling and therefore higher upward mobility in periods of high unemployment.

The quantity-quality model suggests that children with many siblings have smaller chances of advancing educationally beyond their parents' attainment than those, who receive undivided parental attention. The quantity-quality tradeoff should hold not only on average but also at every level of parental educational attainment separately, as marginal cost and benefit schedules may vary within cells of parental education. Reasons for such cost benefit differences may arise e.g. from religious beliefs or from the "fundamental differences that serve to define ethnic groups" (Chiswick 1988, p.591).

Borjas (1993) investigates the educational attainment of immigrants and argues that source country characteristics such as the earnings distribution may affect the selection of emigrants and will therefore still affect their offspring in the destination country: Individuals with above average earnings capacity tend to leave their home country if the distribution of earnings is wider in the destination country and vice versa. Borjas (1993) expects that as long as skills are partly transferable across generations the selection among first generation immigrants will still be reflected in their children's earnings and finds evidence for this: second generation workers

whose parents originated in countries with high inequality have lower earnings which supports the idea that their parents were negatively selected.

We focus on a source country characteristic that does not necessarily affect selection, but may well affect the intergenerational transmission process: If immigrants originate in a country with low levels of average educational attainment this may increase the probability of upward mobility of second generation immigrants in the destination country. If parents originate in a country with low average educational attainment they are more likely to be in low education groups independent of their ability. In this situation upward mobility of their children is more likely than if the parents were highly educated (catch-up effect).

A similar difference between source and destination country may be the culturally determined difference in female education. If females receive generally less education, say in southern Europe than in Switzerland, we expect that the "catch up effect" and with it educational mobility is particularly pronounced for females.

Finally, we investigate whether the Swiss data contain any evidence for the relevance of ethnic effects with respect to the level of educational attainment as well as with respect to educational mobility.

Based on these considerations we propose six hypotheses to be tested below:

- H 1 There are significant differences in intergenerational transmission of education across population groups under a given education system.
- H 2 Educational mobility is smaller in sparsely populated areas where the cost of attending Advanced School is higher due to the requirement to travel larger distances. Educational mobility is smaller also, when due to low unemployment the opportunity cost of continued education declines.
- H 3 The chances to advance beyond parental educational levels are higher for children who do not share their parents' attention with siblings.
- H 4 Second generation immigrants are educationally more mobile if they originate in countries with low average educational attainment (catch up effect).
- H 5 The catch-up effect and educational mobility is on average higher for immigrant females than males.
- H 6 Due to its positive externality we expect higher upward mobility for ethnic groups with high ethnic capital.

These hypotheses regarding heterogeneity in intergenerational transmission are new to



a literature which so far focused on either measuring or explaining intergenerational transmission of education. The Swiss literature on intergenerational transmission of education is mostly descriptive. Buchmann et al. (1993) find that the educational expansion of recent decades did not loosen the relationship between social origins and educational outcome. Lischer et al. (1997) show that the parents of foreign children have lower education than Swiss parents, and that the likelihood of continued education is lower for foreign children. Gilomen (1996) points out that educational attainment varies by national origin and that intergenerational mobility is higher among natives than among foreigners.

Besides such descriptive approaches, another group of studies focuses on the explanation of intergenerational transmission patterns. Excluding liquidity constraints as an explanation, Chevalier (2004) evaluates transmission by nature, e.g. inherited genetic ability endowments, and direct transmission via parental behavior and parenting skills. The challenge is to identify this direct effect of parental education and to separate it from transmission by genetic effects. The literature in this area has used evidence from twins or adopted children and instrumental variables techniques (see e.g. Behrman and Rosenzweig 2002 or Plug 2004). Chevalier (2004) takes advantage of a natural experiment and finds that parental education does have direct effects on child educational outcomes.

Since we have no instruments available, we cannot differentiate the direct parental impact from endogenous mechanisms. Instead, we follow a non-structural approach that measures the total correlation between parent and child education, which is in part genetic and in part the effect of different behaviors of parents with high and low educational degrees.<sup>6</sup>

### **3. Empirical Approach and Data Description**

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<sup>6</sup> Ermisch and Francesconi (2001) provide a rationale based on which the parameters thus obtained can be interpreted as causal.

*Empirical Approach:* Our analysis of intergenerational transmission of education for natives and immigrants proceeds in two steps: First, we describe the intergenerational educational transition patterns for different subsamples. Then, we apply multivariate regressions to estimate the correlation between parent and child education controlling for other characteristics. This allows us to test whether there are significant differences in parental impact across subsamples. This regression analysis is complemented by simulation experiments which indicate the magnitude of the parental influence. Because our dependent variable describes educational attainment as an ordered categorical outcome measure we apply ordered probit estimators.

The regression analysis first investigates the correlation patterns of natives' educational attainment. Besides indicators of parental education (PE), we consider household characteristics (HX) such as parental occupational status and age, and the number of siblings. Among the personal characteristics of the youth (IX) we consider sex and indicators of religious affiliation. A last group of control variables describes the region of residence (RX) using a set of seven geographical or three language regions, a description of the population density in the community of residence and the cantonal unemployment rate. The baseline model is

$$Y_i^* = \alpha + \beta PE_i + \gamma_1 HX_i + \gamma_2 IX_i + \gamma_3 RX_i + \epsilon_i, \quad (1)$$

where the latent variable  $Y_i^*$  describes youth educational outcome,  $\alpha$ ,  $\beta$ , and  $\gamma_1$ - $\gamma_3$  are coefficients, and  $\epsilon_i$  is a random error term. The  $\beta$  coefficients inform about the correlation between parental and youth education.

In order to test whether the correlation between parent and youth educational attainment differs significantly across subsamples, we introduce main effect indicators for these subsamples (S) as well as interaction terms for parental education ( $S \cdot PE$ ):

$$Y_i^* = \alpha_0 + \alpha_1 S_i + \beta_0 PE_i + \beta_1 (S_i \cdot PE_i) + \gamma_1 HX_i + \gamma_2 IX_i + \gamma_3 RX_i + \epsilon_i \quad (2)$$

A significant estimate of coefficient vector  $\beta_1$  would indicate a significant difference in intergenerational mobility across subsamples.

Some of our hypotheses concern the sample of second generation immigrants only. To test these hypotheses we reestimate model 2 for this sample. Since the literature suggests that a number of additional covariates affect the educational outcomes of immigrants compared to natives, we control for a set of immigrant specific covariates (MX) including the immigrant status of both parents, whether an individual's main language is identical to the one spoken in this language region in Switzerland, and indicators for immigrants' region of origin. Also, we consider indicators of ethnic capital, i.e. the number of compatriots in Switzerland in 2000, the share of highly educated individuals among them, and the total number of highly educated compatriots. Again, we estimate a baseline model and one which interacts parental education for subgroups of the second generation immigrant sample. The equations are identical to (1) and (2) except for the additional immigrant specific covariates (MX), which are weighted by a parameter vector  $\gamma_4$ .

*Data Set and Sample:* We apply data from the Swiss census of 2000. It covers the entire resident population with 7.5 million individual observations and provides information on sociodemographic indicators such as family structure, migration status, education, occupation, religion, and language.

In order to learn about intergenerational transmission in education, we need information on child and parent educational attainment. However, the questionnaire does not ask individuals about the educational attainment of their parents. We can only relate child to parent education if we match co-resident parents and children using information on household composition. We focus on youth at the age of 17 for two reasons: First, the large majority of these teenagers still lives in the parental household<sup>7</sup> and, second, the Swiss education system allows us to distinguish educational attainment and youths' choices of secondary schools most clearly at age 17.

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<sup>7</sup> 10.9 percent of all seventeen year olds did not indicate to be the son or daughter of the head of the household they live in.

The census questionnaire defines household heads to be those individuals who are economically or socially responsible for the well-being of the household members (both partners of couples are considered head of household). In order to allow for the correct identification of a youth's parent we dropped those households from the sample where two household heads were of the same sex.<sup>8</sup> In addition, we restricted the sample to those 17 year olds who indicated to be child of the head of household. This excludes youth who live in the home of relatives other than their parents.

In order to match the "correct" parents to the children we impose the condition that parents must at least be 14 years older than the youth, they must indicate in the questionnaire to have children, and they must indicate that their child was born the same year that the youth under consideration was born. Finally, we consider only those youths for whom we have information on their current educational attainment. Out of a total of 87,135 17 year olds in the sample these conditions leave us with 74,147 observations.<sup>9</sup>

To investigate the heterogeneity in intergenerational transmission by immigrant status we define four subsamples: (a) Natives are those Swiss born youths for whom we know that they have at least one Swiss born parent and for whom no parent was born abroad. (b) First generation immigrants were born abroad and have at least one foreign born parent. (c) Second generation immigrants are those Swiss born individuals who have at least one foreign born parent. (d) All remaining individuals are combined in the "other" group.<sup>10</sup> With these definitions

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<sup>8</sup> Since the youth's status in the household is only indicated as child of head of household we would not be certain which of same sex partners would be the true parent.

<sup>9</sup> Out of the difference of 12,988 youths 4.8 percent were lost due to same sex household heads, 72.3 percent because the youth did not indicate to be child of the head of the household - possibly because they lived by themselves already - and for about 19.4 percent of the 17 year olds in the census we could not match their true parents. For about 453 youth (or 3.5 percent) we had no information on their current level of schooling.

<sup>10</sup> This group contains e.g. foreign born individuals with no Swiss parent, or individuals for whom parental place of birth cannot be determined.

our sample of 74,147 17 year old youths contains about 65 percent natives (47,948), about 20 percent second generation immigrants (14,587), 14 percent first generation youth (10,142) and 1,460 other individuals (2 percent). For all ethnic groups the share of females amounts to about 48 percent.

*Dependent Variable:* Based on the educational system described above we generate a categorical outcome variable describing low, middle, and high educational attainment of the 17 year olds. The educational attainment of those who at age 17 have not completed mandatory education or who are not currently pursuing any continued education is considered to be low. Those who completed mandatory school and continue with any type of vocational training have a medium educational attainment, and only those pursuing advanced secondary schooling or who possibly entered university already are considered to be highly educated. Certainly, enrolling for a degree course is not identical with obtaining the degree, but we assume a close correlation. Table 1 describes our sample by educational attainment separately for males and females.

Neglecting the "other" group, we note two patterns: While a smaller share of females has a medium level of education, they are more likely to be enrolled in advanced school. Comparing ethnic groups, we find that second generation immigrants lead in terms of advanced schooling participation even ahead of natives, but they also have higher shares of lowly educated individuals. First generation immigrants do worse than natives or second generation immigrants.

*Explanatory Variables:* The most important set of explanatory variables describes parental education (PE). Similar to youth education levels, we coded three education levels for parents, where we did not consider current educational enrollments but instead exclusively focused on the highest degree obtained. Since not all youths lived with both parents and since some parents did not provide information on their level of education, parental education is coded in five categories

of high, middle, low, no response, and missing parent. The distribution of parental education by sex and ethnic group is provided in the first rows of Table 2.

Comparing the educational attainment of the parent generation across the sexes, we no longer find higher rates of high education for females. Mothers have a smaller probability of high attainment and a higher probability of low attainment than fathers. The comparison between natives and second generation parents parallels that of their children: Immigrants have higher shares of high and low educational attainment, with smaller shares in the middle.

The summary statistics for the other control variables in the native and second generation immigrant models are also presented in Table 2. A number of indicators show substantially different average values for the two subsamples: immigrant youths have on average older parents and fewer siblings. Their parents have worse occupational positions than natives. Interestingly, immigrants seem to be somewhat concentrated in the Italian and French speaking regions of the country, particularly around Geneva. They live in more densely populated regions with higher unemployment rates. The largest share originates in southern European countries<sup>11</sup> and only nine percent speak the language of school instruction at home.

Ideally, and following up on a large literature (cf. Corak et al. 2004) one would control for parental income as a determinant of child educational outcome. Since this variable is not available in the census questionnaire we approximate its content by controls for both parents' occupational position as described in Table 2.

#### **4. Results**

*Description:* As a first comparison of patterns in intergenerational education mobility, panels A and B of Table 3 describe the bivariate distribution of child and parent educational attainments

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<sup>11</sup> The single largest ethnic group in this sample are Italian youth (1987 individuals) followed by those from former Yugoslavia (618), Turkey (615), Spain (531), and Portugal (253).

separately for natives and second generation immigrants. Disregarding the first two columns in each block we find that the probability to remain in a low education group given that either parent is of low education is higher for second generation immigrants (Panel B) than for natives (Panel A). However, the probability of high educational attainment with only lowly educated parents is much higher for second generation immigrants than for natives (15.47 percent with respect to fathers, 14.95 percent with respect to mothers versus 7.53 and 9.53 percent for natives). The same holds for the probability of children of midway educated parents to attend Advanced School: it is much higher for immigrants than for natives. There are only minor differences in the patterns for fathers and mothers. For both ethnic groups we find a higher probability to exceed the attainment of a midway educated mother than to pass the achievement of similarly educated father. The risk of downward mobility to low education is higher for children of well educated immigrants than of well educated natives.

Panel C of Table 3 provides summary indicators for the chances of Advanced School enrollment given parental education for children of both sexes and for several subsamples. It first provides the conditional probability of high educational attainment as an indicator of upward educational mobility. This indicator may be affected by trends such as e.g. educational expansion in a given region. In order to net out such level differences we additionally provide the difference between the probability of advanced school enrollment for children of lowly (col. 2 and 5) and highly educated parents (col. 3 and 6), as an additional (of numerous possible) indicator of educational mobility. The smaller this probability difference (see columns 4 and 7) the more educationally mobile is the considered subsample.

The first row yields that the children of highly educated fathers in the native sample attend Advanced School with a probability of 62.01 percent. This compares to a probability of less than eight percent if the father had only a low degree. The difference in probabilities is similar when relating child attainment to that of their mother. The next two rows present the

aggregate probabilities for male and female children separately and yield higher levels of upward mobility for girls. Since, however, the differences in probability are larger for girls than for boys, girls' advancement varies to a larger extent with parental education than boys'. The same gender difference can be found for second generation immigrants.

The subsequent rows provide first evidence regarding our hypotheses. Contrary to expectations we find higher educational mobility (though lower attainments) in sparsely populated regions. The pattern by cantonal unemployment is similar: the probability of high educational attainment is higher in cantons with high unemployment, but the overall relevance of fathers' education is higher here as well.

Based on the differences in conditional probabilities, educational mobility is higher for youth with few than with many siblings, which we expected based on the child quality vs. child quantity model. We notice large differences in educational mobility and levels of attainment across the Swiss language regions with the highest attainment and mobility in the Italian language region.

Distinguishing between groups of second generation immigrants we find that home country education is hardly correlated with mobility. The impact of ethnic capital on youth educational attainment appears to be clearest in the entries on the share of well educated compatriots: having a large share of highly educated compatriots in the country seems to be correlated with a much higher probability of attending Advanced School independent of parental education. However, the magnitude of the parental impact for educational attainment generally is larger when ethnic capital is limited.

Speaking the regional language is not only correlated with a higher probability of attending advanced school, but also with higher mobility. The relevance of parental education varies by country of origin: families from Western European countries are most similar to Swiss natives, while educational mobility appears to be highest among immigrants from North America.



Finally, having parents without permanent residency in Switzerland is correlated with lower educational attainment in levels as well as with lower educational mobility.

Evaluating this evidence with respect to our hypotheses we do find mobility differences between subsamples which confirms hypothesis one. The evidence with respect to the other alternatives is mixed. In terms of the simple conditional probabilities of attending Advanced School, we find confirmatory evidence for Hypotheses 2, 5, and 6. However, when evaluating the magnitude of parental influence by differencing the conditional probabilities, the conclusions do not hold up. Only the mobility differences in the siblings subsamples appear to match the predictions, where the impact of parental education is the largest, when there are many siblings to care for. Next, we investigate whether these preliminary findings hold up to controls for possible composition effects.

*Estimation Results:* Before discussing the heterogeneity in intergenerational educational mobility across subsamples we briefly survey our baseline empirical model for both, natives and second generation immigrants in Table 4(A). As expected we find highly significant coefficient estimates for our detailed set of parental education controls. Generally, the coefficients for maternal education are larger in magnitude than those for fathers' education and we find a positive correlation between parent and child educational attainment. Interestingly, in our sample missing one parent is correlated with higher educational attainment than the reference group of medium educated parents, whereas having parents who refused to indicate their educational level is correlated with less education compared to the reference group.

Similarly, the correlation patterns across parental occupational positions follow expectations. Generally, children of parents in high positions do better educationally. The coefficients for fathers and mothers of the two samples are jointly highly significant. We confirm prior studies in finding positive correlations of child educational attainment with parental age.

The correlation patterns for the number of siblings are entirely surprising: for natives the coefficients suggest that those youths have the highest educational attainment who have the highest number of siblings. The pattern among immigrants also contradicts our expectations.

The personal characteristics yield that females are significantly more likely to attend Advanced School than men, and that almost all religious groups do worse educationally than the reference groups of christian. The religion coefficients are jointly statistically significant.

The population density in a municipality is not significantly correlated with child education, but the unemployment results suggest the expected positive correlation between high unemployment and high education, possibly via lower opportunity costs of education, when unemployment is high. Also, we find significant regional differences in educational attainment, with the highest educational attainment in the Italian speaking part of Switzerland.

The bottom of Table 4(A) indicates immigrant specific effects in educational attainment. We notice a weak yet jointly significant positive correlation between the degree of parental assimilation in the host country as indicated by resident status and child educational attainment. The correlation patterns of education and region of origin are estimated with Africa as the reference group. The highest educational attainment is found for children of African, Asian, and Western European decent. Suprisingly, the language spoken is not correlated with educational attainment.

In order to interpret the magnitude of the overall intergenerational transmission effects we performed the following simulation experiment separately for the models estimated for natives and second generation immigrants in Table 4: We predicted the probability of high educational attainment for the full sample conditional on both parents either being in the high, medium, or in the low education category. The results are presented in Panel B of Table 4. The probabilities of advanced school attendance differ strongly depending on parental background, however the difference in probabilities with low and high educated parents is much smaller for

second generation immigrants at about 37 percentage points, compared to natives at about 48 percentage points. This suggests that educational attainment in the immigrant sample is less dependent on parental background and that educational mobility is higher here.

After describing these baseline results and determinants of the level of youth educational attainment we now investigate the heterogeneity in intergenerational educational transmission. Our six hypotheses are now addressed in turn. With respect to hypothesis one, i.e. that there are significant differences in educational attainment across subsamples we already found descriptive confirmation in Table 3(C) and found heterogeneity in mobility between natives and second generation immigrants in Table 4(B).

Hypothesis 2 argues that higher direct cost of education should be correlated with lower attainment and lower upward mobility of children of less educated parents. We used the population density as a proxy variable for the cost of attending Advanced School, because travelling distances should be higher in rural areas than in cities. Then we estimated the baseline model of Table 4 with complete interactions of population density with our measures of parental education. The results yielded a positive main effect of population density in the education model and a set of statistically significant interaction terms (see first line in Table (5A)). We repeated the simulation experiment of Table 4(B) now simulating conditional probabilities in regions with high and low population density. The results (see Table 5A) indicate that also conditional on the full set of controls the probability of attending Advanced School with medium and high educated parents is higher when density is high and cost of education lower. However, the magnitude of the impact of parental education is larger in regions of high population density. This is the opposite of what we expected.

Next we tested the correlation of regional unemployment with educational mobility again in a separate estimation which now added interaction terms of cantonal unemployment to the

baseline specification of Table 4A. The main effect was positive and highly significant suggesting on average higher educational attainment where unemployment is high. Also, the interaction effects were jointly significant and the predicted probability of attending Advanced School was overall higher in regions of high unemployment. However, Table 5A suggests a larger role of parental education in regions of low unemployment. So apparently low direct costs of schooling and low opportunity cost of education in periods or regions of high unemployment do not help educational mobility. One could argue that regions of high unemployment are not only characterized by low opportunity cost of education, but also by possibly more binding liquidity constraints on the part of parents. This would then suggest that the probabilities of higher education are overall lower in these regions. However, this is not confirmed by the simulations and we already controlled for the role of parental income background in the estimations. Therefore the liquidity constraint explanation does not seem convincing.

Hypothesis 3 is based on the child quality - child quantity model and suggests that children with many siblings should obtain less of their parents' attention than those who have few or no siblings. Therefore we expect higher educational mobility for the latter. Again the baseline model was estimated with a set of interaction effects of an indicator describing whether a youth is an only child. The main effect was significantly negative indicating a surprising positive correlation between the number of siblings and child educational attainment. The set of interaction terms was not jointly significant and the simulations did not yield largely different outcomes for the two groups.

Our last three hypotheses refer to immigrant specific effects. Hypothesis 4 suggests that second generation immigrants are significantly more educationally mobile in Switzerland if they originate in a country with less average educational attainment than Switzerland. We coded a number of national education measures such as the illiteracy rate, primary, secondary, and tertiary

enrollment rates of a country as well as the internet user rate.<sup>12</sup> Generally the results were similar to the effects of the illiteracy rate presented in Table 5(B): The main effects are insignificant and the interaction effects are at best marginally significant. The simulations yield hardly any difference in the mobility outcomes across the different types of countries of origin. Therefore we do not find any evidence for the expected catch up effect.

We next suggested that due to possibly less egalitarian treatments of females in the home countries the educational mobility of immigrant girls in Switzerland might be higher on average than that of boys. After estimating a full set of gender interactions we obtain significantly different coefficient estimates for the impact of parental education. Table 5(B) indicates that at every level of parental education girls' probability of attending Advanced School exceeds that of boys. However, the total magnitude of the parental impact as measured by the difference in conditional probabilities is again larger for girls than for boys.

Our final hypothesis refers to the ethnic capital hypothesis of Borjas (1992, 1994) which suggests that children whose ethnic group in the host country is better educated are advantaged in their own educational attainment. As discussed above the evidence on this hypothesis is mixed. We defined three measures of ethnic capital based on the census 2000 data: the number of co-ethnics, the share of co-ethnics with high education, and the total number of highly educated co-ethnics. The estimations yielded very similar results across the three outcomes. The main effects indicated a negative correlation between ethnic capital and educational outcomes and the estimated interaction effects of ethnic capital with parental education were always jointly insignificant. The simulations yielded in the case of the indicators for the number of compatriots and the number of highly educated compatriots that educational mobility was - contrary to expectations - higher for those with less ethnic capital (see Table 5B).

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<sup>12</sup> The data are taken from the CIA database.

## 5. Conclusions

In this study we investigate the intergenerational correlation in educational attainment for various subgroups of the Swiss population in 2000. Evidence from prior studies suggests that intergenerational mobility is particularly low in Switzerland. We find substantial correlations in child-parent educational outcomes, where among natives only eleven percent of the children of low educated fathers attend advanced school compared to 62 percent of the children of highly educated fathers.

In the raw data we find large differences in educational mobility which we then investigate in the framework of an ordered probit model of child educational outcomes. We discuss economic theories explaining human capital investment and derive six hypotheses regarding the correlates of mobility in intergenerational education. Our tests, which are based on estimating interaction effects of parental education suggest that most of the predictions do not hold in our data. In a number of instances the differences in the conditional probability of Advanced School attendance across subsamples match expectations, and indicate higher upward educational mobility for those facing low costs of education, for those from countries with lower education, and for female children of immigrants. However, with respect to the magnitude of the impact of parental education we find no confirmation for our hypotheses: higher cost of educational is not correlated with lower education investments, children with many siblings do not suffer an educational disadvantage, female immigrants are no more upwardly mobile than males, low education in immigrants' home country does not yield catch up effects in Switzerland, and ethnic capital does not affect educational mobility.

What may explain these findings? Currently we are investigating the extent to which coding and measurement problems affect the results. First evidence from a different indicator of the number of siblings yields the expected effects. Also, we plan to use region-specific indicators of contemporaneous ethnic capital, instead of the national measures currently applied. In

addition, we will test whether the simple addition of interacted parent education measures is appropriate: possibly subsamples differ not only in the effect of parental education, but also in their correlation with other covariates which we currently neglect. A more flexible specification, e.g. by estimating a separate model for each subsample may yield clearer results. Finally, we plan to add further indicators of educational (upward) mobility, such as the probability of attaining a medium degree given that parents were poorly educated.

Currently our key conclusion is that indeed the probability of upward educational mobility can vary substantially across population groups under a given educational system.

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Table 1: Educational Attainment by Ethnicity and Sex of Youths Aged 17

	Natives		Second Generation Immigrants		First Generation Immigrants		Other	
	Male	Female	Male	Female	Male	Female	Male	Female
Low (in %)	7.71	9.57	14.55	14.47	34.70	35.76	27.74	28.45
Medium (in %)	73.09	62.74	60.29	49.99	51.13	46.11	53.63	45.95
High (in %)	19.20	27.69	25.16	35.53	14.17	18.13	18.63	25.60
Total (in %)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
N. observations	24,775	23,173	7,568	7,019	5,242	4,910	757	703

Source: Own calculations using Swiss Census 2000.

Table 2: Descriptive Statistics on Explanatory Variables by Subsample

	Natives		Second Generation Immigrants	
	Mean	Std.Dev.	Mean	Std.Dev.
<b><i>Parental Education</i></b>				
Father Low (0/1)	0.081	0.273	0.260	0.438
Father Medium (0/1) ( <i>Reference</i> )	0.612	0.487	0.405	0.491
Father High (0/1)	0.093	0.290	0.151	0.358
Father No Response (0/1)	0.009	0.096	0.034	0.182
Father Missing (0/1)	0.205	0.403	0.150	0.357
Mother Low (0/1)	0.189	0.392	0.350	0.477
Mother Medium (0/1) ( <i>Reference</i> )	0.698	0.459	0.429	0.495
Mother High (0/1)	0.050	0.217	0.140	0.347
Mother No Response (0/1)	0.017	0.128	0.046	0.209
Mother Missing (0/1)	0.047	0.211	0.035	0.184
<b><i>Household Characteristics</i></b>				
Father Occ. Position: Unemployed (0/1) ( <i>Reference</i> )	0.005	0.067	0.018	0.132
Father Occ. Position: No training (0/1)	0.028	0.166	0.124	0.329
Father Occ. Position: Low qualified blue collar (0/1)	0.075	0.264	0.069	0.254
Father Occ. Position: Low qualified white collar (0/1)	0.072	0.258	0.055	0.229
Father Occ. Position: 5 (0/1)	0.178	0.383	0.126	0.332
Father Occ. Position: Other selfemployed (0/1)	0.154	0.360	0.094	0.291
Father Occ. Position: Academic / upper mngmt. (0/1)	0.107	0.309	0.095	0.293
Father Occ. Position: Qualified selfemployed (0/1)	0.022	0.146	0.024	0.153
Father Occ. Position: Top management (0/1)	0.030	0.172	0.031	0.174
Father Occ. Position: Not employed (0/1)	0.017	0.128	0.054	0.226
Father Occ. Position Other (0/1)	0.108	0.310	0.160	0.366
Mother Occ. Position: Unemployed (0/1) ( <i>Reference</i> )	0.016	0.127	0.037	0.189
Mother Occ. Position: No training (0/1)	0.078	0.268	0.156	0.363
Mother Occ. Position: Low qualified blue collar (0/1)	0.019	0.137	0.012	0.108
Mother Occ. Position: Low qualified white collar (0/1)	0.234	0.423	0.168	0.374
Mother Occ. Position: 5 (0/1)	0.101	0.301	0.087	0.281

Mother Occ. Position: Other selfemployed (0/1)	0.061	0.240	0.045	0.207
Mother Occ. Position: Academic / upper mngmt.(0/1)	0.022	0.146	0.033	0.179
Mother Occ. Position: Qualified selfemployed (0/1)	0.004	0.060	0.007	0.080
Mother Occ. Position: Top management (0/1)	0.005	0.070	0.008	0.090
Mother Occ. Position: Not employed (0/1)	0.222	0.416	0.226	0.418
Mother Occ. Position: Other (0/1)	0.191	0.393	0.187	0.390
Father Age	38.232	19.873	41.437	18.175
Mother Age	42.951	10.432	43.837	9.738
No Siblings (0/1) ( <i>Reference</i> )	0.289	0.454	0.313	0.464
One Sibling (0/1)	0.451	0.498	0.471	0.499
Two Siblings (0/1)	0.198	0.398	0.171	0.377
Three or more Siblings (0/1)	0.061	0.240	0.044	0.205
<b><i>Individual Characteristics</i></b>				
Female (0/1)	0.483	0.500	0.481	0.500
Religion: Christian (0/1) ( <i>Reference</i> )	0.912	0.283	0.775	0.417
Religion: Jewish (0/1)	0.001	0.034	0.008	0.087
Religion: Islamic (0/1)	0.002	0.048	0.072	0.258
Religion: Other or no denomination (0/1)	0.073	0.260	0.129	0.336
Religion: No response (0/1)	0.012	0.108	0.016	0.126
<b><i>Regional Characteristics</i></b>				
Population Density (inhabitants per 100 km squared)	9.112	14.021	18.095	23.736
Cantonal Unemployment Rate	1.638	0.668	2.032	0.913
Region 1 = VD, VS, GE (0/1)	0.129	0.335	0.237	0.425
Region 2 = BE, FR, SO, NE, JU (0/1)	0.269	0.443	0.170	0.375
Region 3 = BS, BL, AG (0/1)	0.136	0.343	0.148	0.355
Region 4 = ZH (0/1)	0.140	0.347	0.176	0.381
Region 5 = GL, SH, AR, AI, SG, GR, TG (0/1)	0.180	0.385	0.142	0.349
Region 6 = LU, UR, SZ, OW, NW, ZG (0/1)	0.120	0.325	0.065	0.246
Region 7 = TI (0/1)	0.026	0.159	0.063	0.243
Language Region German (0/1) ( <i>Reference</i> )	0.775	0.417	0.639	0.480
Language Region French (0/1)	0.199	0.399	0.298	0.457
Language Region Italian (0/1)	0.026	0.159	0.063	0.243
<b><i>Immigrant Characteristics</i></b>				
Father migration: Swiss since birth (0/1) ( <i>Reference</i> )	-	-	0.251	0.433
Father migration: Swiss since at least 5 years. (0/1)	-	-	0.126	0.332
Father migration: Swiss since up to 5 years. (0/1)	-	-	0.053	0.225
Father migration: Permanent resident permit (0/1)	-	-	0.410	0.492
Father migration: Non-permanent resident permit (0/1)	-	-	0.011	0.102
Father migration: Other (0/1)	-	-	0.0001	0.008
Mother migration: Swiss since birth (0/1) ( <i>Reference</i> )	-	-	0.249	0.433
Mother migration: Swiss since at least 5 years (0/1)	-	-	0.324	0.468
Mother migration: Swiss since up to 5 years (0/1)	-	-	0.043	0.203
Mother migration: Permanent resident permit (0/1)	-	-	0.337	0.473
Mother migration: Non-permanent resid. permit (0/1)	-	-	0.011	0.105
Mother migration: Other (0/1)	-	-	0.000	0.000
Country of origin: Africa (0/1)	-	-	0.047	0.211
Country of origin: (Northern and Eastern) Europe (0/1)	-	-	0.072	0.258
Country of origin: Southern Europe (0/1)	-	-	0.449	0.497

Country of origin: Western Europe (0/1)	-	-	0.249	0.433
Country of origin: Western Asia (0/1)	-	-	0.067	0.250
Country of origin: Latin America (0/1)	-	-	0.032	0.175
Country of origin: North America (0/1)	-	-	0.016	0.127
Country of origin: Asia and Oceania (0/1)	-	-	0.049	0.216
Country of origin: Other (0/1)	-	-	0.019	0.138
Main Language equals cantonal language (0/1)	-	-	0.089	0.285
Home country illiteracy rate	-	-	5.231	10.056
Home country illiteracy rate: missing (0/1)	-	-	0.090	0.286
Home country primary enrollment rate	-	-	97.147	22.371
Home country primary enrollment rate: missing (0/1)	-	-	0.040	0.197
Home country secondary enrollment rate	-	-	78.346	26.107
Home country secondary enrollment rate: missing (0/1)	-	-	0.041	0.198
Home country tertiary enrollment rate	-	-	28.176	13.337
Home country tertiary enrollment rate: missing (0/1)	-	-	0.042	0.201
Home country internet user rate	-	-	0.260	0.168
Home country internet user rate: missing (0/1)	-	-	0.024	0.154
Size of resident ethnic group (in 10,000)	-	-	9.387	8.236
Share of highly educated individuals in ethnic group	-	-	1.094	1.019
Number of highly educated compatriots (in 1,000)	-	-	0.189	0.145
Number of observations			47,948	14,587

Source: Own calculations using Swiss Census 2000.

Table 3 Descriptive Analysis of Intergenerational Education Mobility

Panel A Transition Matrices for Natives (in column percent)

Child education	No Father	Father's Education				No Mother	Mother's Education				Total
		missg.	low	med.	high		missg.	low	med.	high	
Low	14.16	23.54	11.46	6.51	6.23	13.30	27.40	12.18	6.99	6.95	8.61
Medium	66.73	66.59	81.02	72.35	31.76	68.34	65.01	78.29	68.07	30.16	68.09
High	19.10	9.87	7.53	21.14	62.01	18.36	7.60	9.53	24.94	62.89	23.30
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N obs.	9,809	446	3,893	29,352	4,449	2,233	803	9,069	33,469	2,374	47,948

Panel B Transition Matrices for Second Generation Immigrants

Child education	No Father	Father's Education				No Mother	Mother's Education				Total
		missg.	low	med.	high		missg.	low	med.	high	
Low	20.25	27.63	17.98	10.76	9.95	20.78	27.99	18.36	10.82	10.25	14.51
Medium	53.32	58.45	66.54	60.20	24.30	58.43	55.84	66.69	55.20	26.42	55.34
High	26.43	13.92	15.47	29.04	65.76	20.78	16.17	14.95	33.98	63.33	30.15
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N obs.	2,183	503	3,787	5,912	2,202	510	668	5,104	6,265	2,040	14,587

Panel C Summary Statistics of Educational Upward Mobility for Various Subsamples (all probabilities in percent)

Subsample	N	Relative to Father's Educ.			Relative to Mother's Educ.		
		P(hi   F low)	P(hi   F hi)	Diff. (4) = (3) - (2)	P(hi   M low)	P(hi   M hi)	Diff. (7) = (6) - (5)
	(1)	(2)	(3)	(4) = (3) - (2)	(5)	(6)	(7) = (6) - (5)
All Natives	47,948	7.53	62.01	54.49	9.53	62.89	53.36
Male Natives	24,775	5.04	57.32	52.28	6.94	58.77	51.83
Female Natives	23,173	10.15	66.98	56.82	12.28	67.21	54.93
All Second Gen. Immigrants	14,587	15.47	65.76	50.28	14.95	63.33	48.38
Male SGI	7,568	12.11	60.07	47.97	11.39	56.67	45.27
Female SGI	7,019	19.37	71.35	51.98	18.87	70.40	51.53
Natives in Densely Populated Region	10,520	9.40	67.78	58.38	10.70	69.85	59.15
Natives in Sparsely Populated Region	37,428	7.28	59.26	51.98	9.30	58.80	49.50
Natives in Region of High Unemployment	16,233	13.31	67.79	54.48	14.95	65.16	50.20
Natives in Region of Low Unemployment	31,715	5.61	57.35	51.74	7.43	60.34	52.91
Natives without siblings	13,879	6.05	58.73	52.68	8.31	61.51	53.21
Natives with one sibling	21,647	8.65	62.58	53.92	10.54	62.58	52.04
Natives with two siblings	9,479	6.95	63.55	56.60	9.33	64.34	55.02
Natives with at least 3 siblings	2,943	8.09	63.61	55.52	9.03	65.38	56.36
Natives in German Language Region	37,176	5.16	57.32	52.16	6.68	59.15	52.47
Natives in French Language Region	9,520	14.20	73.48	59.28	17.05	68.35	51.31
Natives in Italian Language Region	1,252	27.78	79.43	51.65	27.06	76.19	49.13
Second Gen. I. from high illiteracy country	2,668	12.52	66.47	53.96	12.86	64.87	52.01
Second Gen. I. from low illiteracy country	10,607	16.98	65.43	48.45	16.09	62.75	46.66
Second Gen. I. with large ethnic group in Switzerland	5,421	15.90	67.36	51.46	14.37	67.79	53.42
Second Gen. I. with small ethnic group in Switzerland	9,166	15.10	65.25	50.16	15.33	62.19	46.86
Second Gen. I. with high share of well educated compatriots	6,500	20.83	68.79	47.96	20.66	64.76	44.09
Second Gen. I. with low share of well educated compatriots	8,087	14.65	57.09	42.44	13.46	58.55	45.09
Second Gen. I. with many highly educated compatriots	6,530	15.75	68.36	52.62	14.56	66.47	51.90
Second Gen. I. with few highly educated compatriots	8,057	15.21	64.42	49.21	15.24	61.81	46.56

Second Gen. Immigrants Speaking Cantonal Language	13289	16.37	65.64	49.27	15.70	62.68	46.98
Second Gen. Immigrants not Speaking Cantonal Language	1,398	10.58	67.35	56.77	9.99	72.59	62.61
Second Gen. Immigrants from Africa	681	35.62	74.63	39.02	28.03	72.61	44.58
Second Gen. Immigrants from Europe	1,046	21.57	65.49	43.92	18.92	61.46	42.54
Second Gen. Immigrants from Southern Europe	6,545	15.85	56.39	40.55	14.85	56.99	42.14
Second Gen. Immigrants from Western Europe	3,637	15.10	67.93	52.83	15.19	64.00	48.81
Second Gen. Immigrants from Western Asian	979	8.20	55.86	47.66	7.61	62.32	54.71
Second Gen. Immigrants from Latin America	461	18.60	70.19	51.59	22.00	59.13	37.13
Second Gen. Immigrants from North America	238	33.33	60.42	27.08	42.86	71.43	28.57
Second Gen. Immigrants from Asia and Oceania	716	23.64	74.87	51.23	23.96	68.31	44.34
Second Gen. I. both parents nonpermanent resident status	4,252	14.00	58.21	44.21	13.57	68.11	54.54
Second Gen. I. both parents permanent resident status	6,043	18.84	69.54	50.70	19.20	66.08	46.89

Note: The distinctions between groups of individuals by population density, home country illiteracy, cantonal unemployment, ethnic group size, share of highly educated compatriots, and number highly educated compatriots were made based on the mean of the full sample of individual observations.

Source: Own calculations using Swiss Census 2000.

Table 4 (A) Ordered Probit Estimation of Determinants of Child Educational Attainment

	Natives Coef. (Std. Error)	Second Generation Immigrants Coef. (Std. Error)
<b>Parental Education</b>		
Father Low (0/1)	-0.238** (0.026)	-0.083* (0.034)
Father High (0/1)	0.542** (0.025)	0.416** (0.036)
Mother Low (0/1)	-0.266** (0.018)	-0.221** (0.03)
Mother High (0/1)	0.505** (0.030)	0.376** (0.035)
Father Missing (0/1)	0.091 (0.114)	0.184 (0.14)
Mother Missing (0/1)	0.648** (0.088)	0.463** (0.137)
Father No Response (0/1)	-0.221** (0.063)	-0.169* (0.066)
Mother No Response (0/1)	-0.590** (0.047)	-0.292** (0.058)
<b>Household Characteristics</b>		
Father Occ. Position: No training (0/1)	0.041 (0.091)	0.201* (0.079)
Father Occ. Position: Low qualified blue collar (0/1)	-0.078 (0.085)	0.224** (0.082)
Father Occ. Position: Low qualified white collar (0/1)	-0.029 (0.085)	0.189* (0.085)
Father Occ. Position: Intermediate level occup. (0/1)	0.154+ (0.084)	0.353** (0.079)
Father Occ. Position: Other selfemployed (0/1)	0.053 (0.084)	0.214** (0.080)
Father Occ. Position: Academic / upper mngmt. (0/1)	0.294** (0.085)	0.467** (0.083)
Father Occ. Position: Qualified selfemployed (0/1)	0.315** (0.094)	0.680** (0.106)
Father Occ. Position: Top management (0/1)	0.304** (0.089)	0.455** (0.093)
Father Occ. Position: Not employed (0/1)	-0.109 (0.093)	0.174* (0.084)
Father Occ. Position: Other (0/1)	0.038 (0.084)	0.228** (0.077)
Mother Occ. Position: No training (0/1)	0.09+ (0.048)	0.067 (0.057)
Mother Occ. Position: Low qualified blue collar (0/1)	0.041 (0.059)	0.006 (0.102)
Mother Occ. Position: Low qualified white collar (0/1)	0.179** (0.045)	0.098+ (0.057)



Mother Occ. Position: Intermediate level occup. (0/1)	0.452** (0.046)	0.265** (0.062)
Mother Occ. Position: Other selfemployed (0/1)	0.213** (0.049)	0.035 (0.069)
Mother Occ. Position: Academic / upper mngmt.(0/1)	0.389** (0.060)	0.370** (0.081)
Mother Occ. Position: Qualified selfemployed (0/1)	0.350** (0.111)	0.540** (0.156)
Mother Occ. Position: Top management (0/1)	0.301** (0.090)	0.126 (0.119)
Mother Occ. Position: Not employed (0/1)	0.130** (0.045)	0.040 (0.054)
Mother Occ. Position: Other (0/1)	0.130** (0.045)	0.032 (0.055)
Father Age	0.005** (0.002)	0.003 (0.002)
Mother Age	0.017** (0.002)	0.016** (0.002)
One Sibling (0/1)	0.101** (0.016)	0.0660 (0.026)
Two Siblings (0/1)	0.131** (0.019)	0.051 (0.031)
Three or more Siblings (0/1)	0.144** (0.023)	0.007 (0.043)
<b>Individual Characteristics</b>		
Female (0/1)	0.147** (0.011)	0.181** (0.019)
Religion: Jewish (0/1)	-0.143 (0.158)	-0.176 (0.118)
Religion: Islamic (0/1)	-0.505** (0.116)	-0.164** (0.051)
Religion: Other or no denomination (0/1)	-0.026 (0.022)	0.048 (0.031)
Religion: No response (0/1)	-0.553** (0.051)	-0.480** (0.077)
<b>Regional Characteristics</b>		
Population Density	0.0006 (0.0005)	-0.001 (0.001)
Cantonal Unemployment Rate	0.093** (0.019)	0.117** (0.029)
Region 2 = BE, FR, SO, NE, JU (0/1)	-0.118** (0.031)	-0.119* (0.053)
Region 3 = BS, BL, AG (0/1)	-0.232** (0.034)	-0.223** (0.057)
Region 4 = ZH (0/1)	-0.296** (0.029)	-0.240** (0.049)
Region 5 = GL, SH, AR, AI, SG, GR, TG (0/1)	-0.174** (0.035)	-0.207** (0.061)
Region 6 = LU, UR, SZ, OW, NW, ZG (0/1)	-0.125** (0.040)	-0.160* (0.072)

Region 7 = TI (0/1)	0.404** (0.039)	0.267** (0.047)
<b>Immigrant Characteristics</b>		
Father migration: Swiss since at least 5 years. (0/1)	-	0.029 (0.038)
Father migration: Swiss since up to 5 years. (0/1)	-	-0.026 (0.057)
Father migration: Permanent resident permit (0/1)	-	-0.011 (0.038)
Father migration: Non-permanent resident permit (0/1)	-	-0.116 (0.114)
Father migration: Other (0/1)	-	0.004 (0.031)
Mother migration: Swiss since up to 5 years. (0/1)	-	0.110+ (0.059)
Mother migration: Permanent resident permit (0/1)	-	0.017 (0.034)
Mother migration: Non-permanent resident permit (0/1)	-	-0.411** (0.109)
Mother migration: Other (0/1)	-	0.009 (1.148)
Country of origin: Europe (0/1)	-	-0.160** (0.061)
Country of origin: Southern Europe (0/1)	-	-0.091+ (0.052)
Country of origin: Western Europe (0/1)	-	-0.083 (0.052)
Country of origin: Western Asia (0/1)	-	-0.211** (0.066)
Country of origin: Latin America (0/1)	-	-0.136+ (0.073)
Country of origin: North America (0/1)	-	-0.116 (0.091)
Country of origin: Asia and Oceania (0/1)	-	-0.021 (0.066)
Country of origin: Other (0/1)	-	-0.285** (0.086)
Main Language equals cantonal language (0/1)	-	-0.024 (0.035)
Threshold Parameter 1	-0.084 (0.130)	0.118 (0.180)
Threshold Parameter 2	2.192** (0.130)	1.890** (0.180)
Number of observations	47,948	14,587
Log Likelihood	-35,491.49	-12,616.04

Table 4 (B) Simulation Results of the Two Main Models

	Natives	Second Generation Immigrants
(1) Pr (high   parents low)	10.29	19.66
(2) Pr (high   parents middle)	21.53	28.38
(3) Pr (high   parents high)	58.09	56.45
Difference (3) - (1)	47.80	36.79

Source: Own calculations using Swiss Census 2000.

Note: \*\*, \*, and + indicate statistical significance at the 1, 5, and 10 percent level.

Table 5(A) Simulation Results of Interacted Models - Natives

	Population Density		Cantonal Unemployment		Number of Siblings	
Joint significance of 8 interaction coefficients, $\chi^2$ (p value):	78.14 (0.000)		41.02 (0.000)		9.78 (0.281)	
	Density high	Density low	Unem. high	Unem. low	0 siblings	> 0 siblings
(1) Pr (high   parents low)	7.70	11.27	9.76	9.99	7.53	10.85
(2) Pr (high   parents middle)	22.25	21.22	25.22	18.99	19.75	21.86
(3) Pr (high   parents high)	60.26	55.42	61.63	56.29	57.10	58.44
Difference (3) - (1)	52.56	44.15	51.87	46.30	49.57	47.59

Note: To simulate transition probabilities under high and low population density, the density variables were set to plus one and minus one standard deviations above and below the mean. Since the latter yielded a negative value, zero was used instead.

Table 5(B) Simulation Results of Interacted Models - Second Generation Immigrants

	Home country illiteracy		Females		# highly educated co-ethnics	
Joint significance of 8 interaction coefficients, $\chi^2$ (p value):	15.18 (0.056)		20.54 (0.009)		9.23 (0.323)	
	Illiter. high	Illiter. low	Fe-males	Males	High	Low
(1) Pr (high   parents low)	20.06	19.88	21.13	18.95	18.43	20.20
(2) Pr (high   parents middle)	28.10	28.90	31.95	26.21	28.17	28.54
(3) Pr (high   parents high)	58.16	56.08	65.52	49.88	57.51	55.16
Difference (3) - (1)	38.10	36.20	44.39	30.93	39.08	34.96

Note: To simulate transition probabilities under high and low illiteracy rates, the variables were set to plus one and minus one standard deviations above and below the mean.

Source: Own calculations using Swiss Census 2000.