De Economist (2016) 164:159–186
DOI 10.1007/s10645-016-9273-4

Native-Immigrant Gaps in Educational and School-to-Work Transitions in the 2nd Generation: The Role of Gender and Ethnicity

Stijn Baert[1,2,3,4] · **Frank W. Heiland**[5,6,7] · **Sanders Korenman**[5,6,8]

Published online: 23 February 2016

Abstract We study how native-immigrant gaps in educational trajectories and school-to-work transitions vary by gender. Using longitudinal Belgian data and adjusting for family background and educational sorting, we find that second-generation immigrants, especially Turks and Moroccans, lag behind natives. In particular, we observe that immigrant students are less likely to finish secondary education or begin tertiary education on time. They are also less likely to transition into work successfully. These performance gaps are substantially larger for female immigrants. In addition, we study demographic behaviors to test the hypothesis that attributes the gender differences in educational and economic ethnic gaps to cultural differences between immigrants and natives.

Keywords Educational attainment · School-to-work transitions · Dynamic selection bias · Ethnic minorities · Gender differentials · Belgium

JEL Classification I24 · J15 · J16 · J70 · Z10 · C35

✉ Stijn Baert
Stijn.Baert@UGent.be

1 Ghent University, Sint-Pietersplein 6, 9000 Ghent, Belgium

2 University of Antwerp, Antwerp, Belgium

3 Université catholique de Louvain, Louvain, Belgium

4 IZA, Bonn, Germany

5 Baruch College School of Public Affairs, The City University of New York, New York, NY, USA

6 CUNY Institute for Demographic Research, The City University of New York, New York, NY, USA

7 CUNY Institute for Demographic Research, The Graduate Center, New York, NY, USA

8 NBER, Cambridge, MA, USA

1 Introduction

The debate over immigration policy in Europe has shifted to economic and sociocultural assimilation of the second generation (Dustmann et al. 2012). Education systems are viewed as the primary engines of assimilation and economic progress of immigrants and especially their children. Therefore, not surprisingly, during the past two decades researchers have analyzed (family background adjusted) gaps between natives and second-generation migrants in education and school-work transitions. Most studies find that second-generation migrant youths partly catch up with natives in terms of economic performance but that they still lag behind natives to a substantial extent (Baert and Cockx 2013; Card 2005; Chiswick and DebBurman 2004; Eckstein and Wolpin 1998; Hagy and Staniec 2002; Ortiz and Dehon 2008; Ryan 2001). Identifying ethnic performance gaps is one thing; reversing them is another. To effectively combat native-immigrant ("ethnic") gaps in education and the transition from school to work, it is important to aim policy actions at the right subgroups of migrants.

One key dimension along which ethnic gaps might vary is gender. Scholars have linked ethnic performance gaps to cultural differences: "traditional" norms and values that emphasize family social and economic systems and nurturing roles for women. These explanations suggest that cultural influences should operate at least partly through demographic behaviors such as earlier marriage, especially for second-generation women, compared to native women. Family formation studies show that demographic behaviors indeed differ greatly between immigrants and natives, among immigrant groups and between men and women within these groups (Andersson et al. 2015; De Valk and Liefbroer 2011; Dronkers and Kornder 2014, 2015; East 1998; Glick et al. 2006; Glorieux and Laurijssen 2009; Huschek et al. 2011a, b, c; Kulu and Gonzalez-Ferrer 2014; Lesthaeghe and Surkyn 1995; Pailhe 2015; Sobotka 2008; South 2001; Trilla et al. 2008; Van Zantvliet et al. 2014).

A second explanation for gender differences in immigrant-native gaps involves ethnicity-based discrimination in education or hiring. Glorieux and Laurijssen (2009) and Timmerman et al. (2003) argue that female migrants may be less likely than males to fall victim to discrimination because migrant women are less visible and less involved in the public domain than are migrant men, and because the negative stereotypes about males of particular groups of migrants (especially Muslims) do not apply to females from those communities. So, whereas traditional gender norms are expected to hinder successful educational and economic outcomes of immigrant females more than males, labor market discrimination is thought to have greater adverse effects on immigrant males than females. As a consequence, studying gender differences in ethnic gaps in education, school-work transitions and demographic behaviors could yield insights into the relative influence of sociocultural factors and discrimination.

We are aware of only three empirical studies of gender differences in ethnic performance gaps in youth (Dronkers and Kornder 2014, 2015; Fleischmann and Kristen 2014). These studies have linked gender differences in native-immigrant gaps in international educational attainment within a variety of European countries to characteristics of the origin country, the destination country, immigration policy, educational institutions and policies of the destination country, as well as "social distance" between the origin and destination countries. However, none of these empirically links edu-

cational gaps to gaps in labor market outcomes, nor do they provide empirical tests of possible mechanisms underlying these gaps. Lastly, none of them accounts for educational sorting. In the present study, we fill these research gaps.

More concretely, we provide new estimates of gender differences in performance gaps between native and second-generation migrants in Flanders (Belgium), using the econometric approach taken by Baert and Cockx (2013). This approach allows us to decompose observed (male and female) ethnic gaps into a part due to differences in (observed) family endowments and a residual, "pure ethnic", part, taking dynamic selection based on unobservables into account. Moreover, this approach provides us with a unified framework to study educational and school-work transitions. In addition, we examine demographic behavioral outcomes (e.g., marriage, fertility and cohabitation) related to cultural explanations for the residual gender differences in ethnic gaps.

In the next section, we review the nascent international literature on gender differences in ethnic schooling gaps in the European second generation, discuss the problem of educational sorting in this literature and then focus on the Flanders setting and the literature on education and employment of second-generation Turks and Moroccans in Flanders. The third section describes our data and methods. In the fourth section, we discuss our findings, including our estimates of gender differences in residual ethnic gaps in schooling and school-work transitions and the demographic behaviors underlying these gaps. The fifth section concludes.

2 Literature and Study Setting

2.1 European Evidence on Gender Differences in Immigrant Gaps in the 2nd Generation

We begin with a review of the limited international comparative literature that has estimated gender differences in immigrant gaps (alternatively and equivalently, differences between natives and immigrants in gender gaps) in educational outcomes. As mentioned, we know of no studies of this type that link educational gaps to gaps in labor market outcomes and demographic behaviors.

Fleischmann and Kristen (2014) investigated whether the "second generation has assimilated to the *female advantage* in educational achievement in Western destinations, despite widespread and persistent female disadvantage in many countries of origin" (p. 162, emphasis added). They concluded that, in general, it has. Using multiple data sets cross-nationally, they compared gender gaps in various schooling outcomes among natives and second-generation within country, net of the effects of parents' education, occupational status, and family composition. Generally speaking, within European destination countries, Fleischmann and Kristen (2014) found ethnic penalties (immigrant disadvantages) but female advantages for most immigrant groups mirroring the native gender gap.[1] As a result, overall, ethnic gaps came out to be comparable for males and females.

[1] Although it is not entirely clear from the authors' descriptions, educational attainment outcomes appear to be conditioned on completion of previous levels. For Belgium, there are substantial negative "ethnic" main effects in outcomes other than academic tracking, and female advantages, conditional on family background. As a consequence, conditioning on entering the next educational stage potentially biases estimates of both

Dronkers and Kornder (2014) estimated gender gaps in international test (PISA) scores, comparing natives and immigrants. They found, in contrast to Fleischmann and Kristen (2014), substantial gender differences in reading scores for immigrants, controlling for region of origin and destination, and a variety of origin, destination and family characteristics. Female ethnic gaps were found to be smaller than male ethnic gaps. In addition, the gender differences in outcomes were not related in any systematic way to poverty or "traditional" gender roles in the origin country.

In a related paper, Dronkers and Kornder (2015) included measures of gender equity in both origin and destination countries, as well as controls for other macro and individual characteristics, to provide more direct tests of hypotheses about variation in gender differences in ethnic native-immigrant gaps. Additional macro-level controls included characteristics of educational systems, level of economic development and religions in the country of origin. They found that gender equity in the origin country increases the relative female advantage of migrant daughters compared to sons in reading but not math. Destination country gender equity, on the other hand, was associated with lower reading and math scores for immigrant children, males and females, with no significant difference between the effect for males and females. Thus, there was no evidence that greater destination country gender equity disproportionately helps female immigrants.

2.2 Educational Sorting

A problem with this literature is that these analyses ignore the dynamic sorting that takes place in educational progression. Cameron and Heckman (1998) show formally that, therefore, these analyses might be biased. Intuitively, this bias is brought about by the fact that performance-based educational progression produces increasingly negative correlations between endowments observed by the researcher and unobserved endowments as students progress through school beyond the compulsory grades. This is the case because pupils with adverse observed endowments pass the final evaluation at the end of a particular grade and continue schooling only if their unobserved endowments are sufficiently favorable. The effects of observed endowments such as parents' education are, as a consequence, progressively biased downward (understated) as education levels increase. Because minority groups tend to have lower parental education (thus, adverse observed endowments), the residual ethnic gap will also be biased downward (overstated) (Baert and Cockx 2013; Cameron and Heckman 1998, 2001). As this dynamic sorting might differ between male and female second-generation immigrants, not controlling for this dynamic selection process might bias estimated gender differences in native-immigrant gaps.

This selectivity problem was explicitly addressed by Cameron and Heckman (2001) by modeling the decision to drop out in each school year as a dynamic discrete choice model that explicitly controls for unobserved determinants of this drop out decision

Footnote 1 continued
ethnic gaps and gender by ethnicity gaps in completion of that stage; i.e. gap estimates may be biased by dynamic selection (see Sect. 2.2).

which may generate the mentioned dynamic sorting. Baert and Cockx (2013) extend their model by (i) explicitly modeling grade retention as an outcome and determinant of schooling progression, and (ii) distinguishing between educational achievement (passing or failing) and the decision to stay in school (rather than leaving) after each grade. In the present study, we build on Baert and Cockx (2013) and allow dynamic sorting to happen differently for each subsample of pupils by gender and migration status.

2.3 Flanders Setting

In this subsection we describe the institutional context of our study, i.e. Flanders, with respect to migration (policies) and how the characteristics of this setting may affect (gender differences in) ethnic gaps.

Belgium had a disadvantaged initial (1960s) immigrant stream from Turkey and Morocco, concentrated in particular regions within the sending countries, before "closing its borders" to labor market immigration in the early 1970s. Subsequent shifts of immigration policy, initially toward family reunification and later toward marriage, produced "marriage migration" streams fed by these same geographically narrow and disadvantaged areas (Reniers 1999; Timmerman et al. 2003, 2009).[2] As a result, in Flanders, as recently as the early 2000s when the data used in this study were collected, 60 % of men and women from the Turkish second generation married a partner from Turkey (i.e. a first-generation migrant; Timmerman et al. 2009). Thus, policy shifts may have reinforced the disadvantaged nature of the immigrant flow and, combined with sociocultural practices including marriage migration, strengthened the role of ethnic networks and the value of ethnic capital, shaping the course and speed of integration of immigrants and their children into Belgian society (Reniers 1999; Timmerman et al. 2009). In particular, these characteristics of the Flanders setting may have encouraged both the intergenerational transmission of traditional (gender-role) norms among ethnic minorities and discrimination in school and in the labor market (Timmerman et al. 2003). In addition, concerning labor market discrimination, a recent audit study found evidence for hiring discrimination in Flanders, though it only tested for discrimination against Turkish males (Baert et al. 2015). As argued in the introduction, both the persistence of traditional norms among ethnic minorities and the discrimination they undergo may have led to gender differences in ethnic performance gaps in youth, the focus of the present study.

On the other hand, Flanders also has characteristics favorable to economic success and absorption of immigrants, including a strong and diversified economy and an excellent education system. Education, including higher education, is inexpensive or free and open to qualified students. Pupils rank highly on international tests of student performance (Prokic-Breuer and Dronkers 2012). However, excellent education systems

[2] Recently, the 2009–2014 Flanders' government's "Pact 2020" attempted to discourage marriage migration among second- and third-generation immigrants "… with the intention to cut off a recognized vicious cycle of social deprivation" (Pelfrene et al. 2009). However, the school and labor market trajectories of the individuals we model in this study cannot be affected by this recent shift as these trajectories are censored from 2009 forward.

can reproduce as well as dampen inequality, depending on how well students are prepared to enter school, how they choose or are allocated to schools, programs ("tracks") and classrooms, among other educational institutions (Dustmann et al. 2012). These dynamics might differ by gender and, as a consequence, be additional reasons for gender differences in native-immigrant gaps.[3] We revisit the mechanisms underlying gender differences in ethnic gaps in Sects. 4.2 and 4.3.

2.4 Native-Immigrant Gaps in Flanders in the 2nd Generation

Our study is related to two articles (Baert and Cockx 2013; Glorieux and Laurijssen 2009) that rely on the same data as those analyzed in the present study, i.e. the SONAR data covering the transition from school to work for 9,000 individuals in Flanders, which will be presented in the following section. These two studies do not focus on gender differences although in the former one some gender-ethnicity-interactions are included in part of the analyses.

Glorieux and Laurijssen (2009) estimated ethnic gaps adjusted for observed family background characteristics employing cox hazard models of unemployment duration after school-leaving and MANOVA models for other outcomes. In some models, for some outcomes, they interacted gender with both education level and ethnicity. These gender by ethnicity interactions are of particular interest for our purposes. The authors report, in contrast to Dronkers and Kornder (2014), that in Flanders ethnic background is much more important for women than men. Specifically, Glorieux and Laurijssen (2009) found in models with gender interactions that the ethnic differences in employment for males were modestly adverse but insignificant for all immigrant groups except North Africans, while for women, very large and statistically significant gaps in school-work transition remained for those of Turkish and North African ethnicity.

The aforementioned study of Baert and Cockx (2013) compared educational attainment and school-to-work transitions of second-generation immigrants (predominantly ethnic Moroccans and Turks) to natives of Flanders. They found that, although unadjusted ethnic gaps in education are large, residual ethnic educational gaps are small unless the outcome is *on-time* completion of education, in which case the residual gaps are quite large. Ethnic gaps in school-to-work transitions were similar whether or not they adjusted for differences in schooling and family background, indicating a role for labor market discrimination in hiring.

Baert and Cockx (2013) also found that a substantial portion of the residual ethnic educational gap arose in (the US equivalent to) 10th grade or at around age 16 for "on-time" students. The latter finding is reminiscent of findings from the US literature on the consequences of teenage childbearing: initially large gaps (relative to older mothers) in socioeconomic outcomes associated with early fertility narrow as teenage mothers enter their late 20s and early 30s and some may reverse (e.g., Hotz et al. 2005). Therefore, this literature suggests that it may be useful to investigate whether

[3] The dynamics in educational allocation may relate to the aforementioned traditional gender-role norms among immigrant families, reducing the motivation among females (or their families) to invest in higher quality education programs.

the residual ethnic gaps in Flanders differ by gender and are also found in demographic behaviors such as marriage that could influence educational and labor market choices and outcomes, or be jointly determined with them.

3 Data and Methods

3.1 Data

As mentioned in Sect. 2.3, we use longitudinal data from the SONAR project (roughly translated as the Study of the Transition from School to Work in Flanders). SONAR data represent cohorts of 3,000 pupils born in 3 years: 1976, 1978 and 1980. Interviews were conducted at age 23, 26 and 29, but our data are mainly taken from the first waves at age 23 to avoid bias from selective attrition. Ethnic origin is based on the birth country of the maternal grandmother, i.e. the maternal grandmother was not born in Belgium or any other Western country for the youth we label as "immigrant". The sample is restricted to those who were in Belgium at least from the start of nursery school onward (i.e. from the age of 2 years and a half), so "immigrants" are mostly second generation. After dropping those with missing or inconsistent educational or labor market data, the analysis sample includes 7,256 natives (3,698 males and 3,558 females) and 359 immigrants (165 males and 194 females). Among the immigrants, the majority is Turkish (122 individuals) or Moroccan (87 individuals). Nearly all have obtained Belgian nationality at age 23. For all these individuals we observe multiple schooling and labor market outcomes, as explained below.

3.2 Summary Statistics

Table 1 provides initial descriptive evidence that further motivates our focus on (gender differences in) immigrant-native gaps in Flanders, as well as the focus within the literature on the second-generation in Belgium on Moroccan and Turkish youth. Moroccan and Turkish youth make up the majority of the second generation in Flanders, for example 210 out of 361 in our analysis sample (Table 1, bottom row). As becomes clear from the upper rows of Table 1, immigrant youth have grown up in markedly more disadvantaged circumstances than their native counterparts. In addition, they show weaker schooling and initial labor market outcomes.

The immigrant groups are younger (disproportionately from the 1980 birth cohort), so it is important to control for birth cohort in econometric analyses, as we do. The parents of the Moroccan and Turkish second generation have much lower education levels than others. Their mothers, on average, have almost no successfully completed education after age 12 and their fathers have only a little more (see the table footnote for educational category definitions). In contrast, mothers and fathers of natives average nearly a complete secondary education. The parents of other second generation immigrant groups are intermediate, averaging at least some secondary education. Furthermore, the Turkish and Moroccan second generation grew up in much larger families and was less likely to speak Dutch in the parental home. Lastly, they were also more likely to delay their entry into primary school (i.e. the initial conditions of

Table 1 Selected family socioeconomic background and outcome variables [means (SEs) and proportions]

	Males			Females		
	Native	"Second Generation"		Native	"Second Generation"	
		Turkish and Moroccan	Other		Turkish and Moroccan	Other
Family socioeconomic background						
Birth cohort						
1976	31.8	22.8	20.6	31.6	23.1	13.0
1978	34.1	25.0	32.9	34.4	29.9	28.6
1980	34.1	52.2	46.6	34.0	47.0	58.4
Education after age 12[1]						
Mother	5.6	0.8	3.4	5.5	0.8	3.2
	(0.1)	(0.2)	(0.4)	(0.1)	(0.2)	(0.4)
Father	6.0	0.9	4.6	5.9	1.2	3.6
	(0.1)	(0.2)	(0.4)	(0.1)	(0.2)	(0.4)
Number of Siblings	1.5	4.3	2.0	1.6	4.9	2.4
	(0.0)	(0.2)	(0.2)	(0.0)	(0.2)	(0.2)
Dutch @ home	98.4	71.7	86.3	98.6	78.6	83.1
Delay school start	1.2	7.6	2.7	1.1	6.8	0.0
Outcomes						
Entered tertiary education	75	45	61	86	50	73
In school at age 23	19	8	18	16	6	9
Not working within 3 months of leaving school (among those who finish school by age 23)	25	53	33	29	68	39
Sample size (maximum)	3718	92	73	3569	118	78

1. Maternal and paternal education age is a categorical variable ranging from 0 to 13 with higher-numbered categories generally indicating more education after age 12; regressions include dummy variables for each category; 0: Primary education (or no diploma at all); 3: Lower secondary education; 6: Higher secondary education or apprenticeship; 7: Non-higher level post-secondary education (vocational or technical); 9: Non-university higher education—"short type"; 10: Non-university higher education—"long type"; 11: Academic education; 13: Post-academic/doctoral education

the econometric model we will use to calculate residual ethnic gaps by gender), with about 7–8 % beginning after age 6. The latter gap is probably (partly) explained by (i) insufficient command of the school language and (ii) less parental stimulation and guidance during nursery education (Glorieux and Laurijssen 2009; Timmerman et al. 2003).

Not surprisingly given these disadvantaged family socioeconomic backgrounds, the Turkish and Moroccan second-generation youth are far less likely than natives to enroll in tertiary education. At age 23, 16–19 % of natives are still enrolled in school, compared to 6–8 % of second-generation Turkish and Moroccans. The latter

group also has slower rates of job-finding after leaving school; among Turkish and Moroccan youth who have left school by age 23, two-thirds of women and half of men are not working 3 months after leaving school, more than double the corresponding proportions for natives.

Table 1 further indicates that the observed (unadjusted) gender differences in the ethnic gaps vary across outcomes. For example, the unadjusted education gaps appear larger for men than women, while the unadjusted employment gaps appear larger for women than men. We come back to these gender differences in Sect. 4.1. Our main econometric analysis aims to determine whether these (gender differences in) observed educational and labor market gaps can be explained by family socioeconomic background differences or remain large for similarly disadvantaged immigrants and natives.

3.3 Methods

In order to study the magnitude of gender differences in native-immigrant gaps in educational attainment and early labor market outcomes, adjusted for family background and educational sorting, we perform simulations similar to those conducted by Baert and Cockx (2013), though separately for men and women. To this end, we first estimate our econometric model presented below for four subpopulations: male natives, female natives, male immigrants and female immigrants.[4] We then use the parameter estimates to decompose total ethnic gaps into a part explained by observed endowments (the family background characteristics mentioned in Table 1) and a residual part related to what we call "pure ethnic" differences.

We follow Baert and Cockx (2013) in modeling school progression and the transition from school to work as a sequence of discrete outcomes and choices. This sequence starts at the beginning of primary school, typically at age six. However, pupils can start primary school 1 year earlier or 1 year later.[5] The starting point is, therefore, a model of the number of years of delay at the start of primary schooling. Since grade-to-grade educational progression is observed only from the start of secondary school, we collapse primary school grades into a single stage for which the number of years of delay at the start of secondary education is modeled, conditional on the (number of) years of delay when starting primary school. From secondary education forward, we model for each (secondary and tertiary) schooling year, conditional on starting it, the probability of passing (versus not passing), and, conditional on this event, the probability of continuing schooling (at a higher grade if passing or at the same grade if not passing). Finally, we model the probability of being employed 3 months after leaving school (or, in an alternative version of the model, of being employed with a permanent contract 2 years after leaving school).

[4] For the analyses focused on Turks and Moroccans, we do not separate males and females for reasons of limited sample sizes but only include a dummy variable for female sex. We come back to this issue in Sect. 4.1.

[5] The choice to send children to primary education is formally made by their parents. However, in practice, parents follow teachers' judgement of whether their child is school ready.

Econometrically, the model is implemented as a chain of (binary and ordered) logistic probabilities. Each outcome is explained by (i) grade dummies, (ii) a vector of time-constant and strictly exogenous family background characteristics, (iii) the (time-varying) unemployment rate,[6] (iv) the accumulated years of schooling delay and (v) an unobservable component. The family background variables (iii) include mother's education level, father's education level, number of siblings, day of birth within the calendar year and speaking Dutch in the parental home (as described in Table 1). The unobservable component is comprised of a random individual-specific effect, an interaction between the individual-specific effect and the accumulated years of schooling delay and an i.i.d. error term. Concerning the distribution of this random individual-specific effect, we adopt a non-parametric distribution in the spirit of Heckman and Singer (1984). We assume this distribution to be characterized by an (a priori unknown) number of points of support K to which probabilities are assigned. The distribution is identified based on the assumption that at the start of the model (i.e. the start of primary education), the unobserved characteristics are orthogonal to the adopted family background characteristics (Cameron and Heckman 2001).[7] The model is estimated by maximum-likelihood techniques. The subsequent logit models are jointly introduced in the likelihood and jointly estimated since, as a result of the introduction of the unobservable component in the modeling of all choices and outcomes, these logits are linked with each other.

Our decomposition strategy, in the spirit of Baert and Cockx (2013), simulates the model on random samples each of size $\boldsymbol{R}$ ($\boldsymbol{R}$ is 5,000 in the application) of the native and immigrant samples used for estimation. Let $\boldsymbol{Z_N}$ and $\boldsymbol{Z_I}$ be $\boldsymbol{R} \times \boldsymbol{M}$ matrices storing the $\boldsymbol{R}$ random draws from, respectively, the native (male or female) and immigrant (male or female) youth observed exogenous endowment distributions and the time-varying strictly exogenous variables. Let $\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}$ and $\hat{\boldsymbol{\vartheta}}_{\boldsymbol{I}}$ denote, respectively, the native and immigrant parameter estimates including those referring to the endogenous variables (grade g and schooling delay $\boldsymbol{V}_t$) and the distribution of the unobserved heterogeneity. The observed total gap, represented by the (gender-specific) log expected odds ratio of natives to migrants, for an outcome $\boldsymbol{O}$ can then be predicted by simulation as follows:

$$log\left(\frac{E_{\boldsymbol{Z_N}} Pr\left[O|\boldsymbol{Z_N};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}\right]}{E_{\boldsymbol{Z_I}} Pr\left[O|\boldsymbol{Z_I};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{I}}\right]}\right), \tag{1}$$

[6] In line with Baert and Cockx (2013) we use two different unemployment rates depending on the modeled transition. On the one hand, the unemployment rate of the 24–64 year-old male population is used as a covariate in the logit models explaining the educational outcomes as this variable proxies the labor market conditions of the (usually) male breadwinner during the period that his child is in education. On the other hand, for the logistic model explaining the transition from school to work, we include the youth (aged 15 to 24) unemployment rate as a time-varying covariate.

[7] As a consequence, the exogeneity of the latter variables is a *conditio sine qua non* and potentially relevant variables such as whether or not the parents work out of home (Künn-Nelen et al. 2015) could not be included.

where $\boldsymbol{Pr}[\boldsymbol{O}|.;.]$ is the probability that a particular outcome $\boldsymbol{O}$ is realized according to the model simulation and $\boldsymbol{E}_{\boldsymbol{Z_N}}$ and $\boldsymbol{E}_{\boldsymbol{Z_I}}$ the expectations over the distributions of $\boldsymbol{Z_N}$ respectively $\boldsymbol{Z_I}$.

Based on this framework, Baert and Cockx (2013; Equation 8) propose the following decomposition of the (predicted) total ethnic gap in Eq. (1) into the sum of an (explained) 'endowment' gap and a residual "pure ethnic" gap:

$$log\left(\frac{E_{Z_N} Pr\left[O|\boldsymbol{Z_N};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}\right]}{E_{Z_I} Pr\left[O|\boldsymbol{Z_I};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{I}}\right]}\right) = log\left(\frac{E_{Z_N} Pr\left[O|\boldsymbol{Z_N};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}\right]}{E_{Z_I} Pr\left[O|\boldsymbol{Z_I};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}\right]}\right) + log\left(\frac{E_{Z_I} Pr\left[O|\boldsymbol{Z_I};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}\right]}{E_{Z_I} Pr\left[O|\boldsymbol{Z_I};\hat{\boldsymbol{\vartheta}}_{\boldsymbol{I}}\right]}\right). \quad (2)$$

The first term on the right-hand side of Eq. (2) is the gap that can be explained by differences in the observed endowments $\boldsymbol{Z_N}$ and $\boldsymbol{Z_I}$, evaluated by using the parameters as estimated on the native sample, $\hat{\boldsymbol{\vartheta}}_{\boldsymbol{N}}$. The last term in Eq. (2) defines the residual "pure ethnic" gap. It reflects the gap between native and immigrant youth induced by differences in the parameter estimates, including those related to the unobservables.

Last, Baert and Cockx (2013) propose a procedure that decomposes the "pure ethnic gap" into parts that depend on the moments at which it is generated. The procedure uses the fact that a particular educational attainment can only be realized if successful outcomes were attained at earlier stages: educational attainments realize sequentially. We can, as a consequence, write the probability of a (successful) outcome in school or in the labor market as the product of conditional probabilities, where conditioning at each stage is based on a successful educational outcome at an earlier stage. Thus, by writing the ethnic gaps as a log odds ratio, a successful educational outcome at a particular stage can be decomposed into a sum of log odds ratios of the conditional probabilities of success at earlier stages.

4 Results

4.1 Main Results: Gender Differences in Residual Ethnic Gaps

We follow Baert and Cockx (2013) in highlighting six educational and school-work transitions: (i) passing secondary education (or, in US equivalent terms, 12th grade); (ii) starting tertiary education; (iii) passing secondary education without delay; (iv) starting tertiary education without delay; (v) employed within 3 months after leaving school among those with no more than secondary education (either on time or delayed); and (vi) employed within 3 months after leaving tertiary education (with a grade 1 to 4 degree and less than 1 year of delay).

Figure 1 shows unadjusted proportions for outcomes (i) to (vi) as observed in the raw data for natives, Turkish and Moroccan second-generation youth, and the second-generation youth of other immigrant groups, separately for men and women.

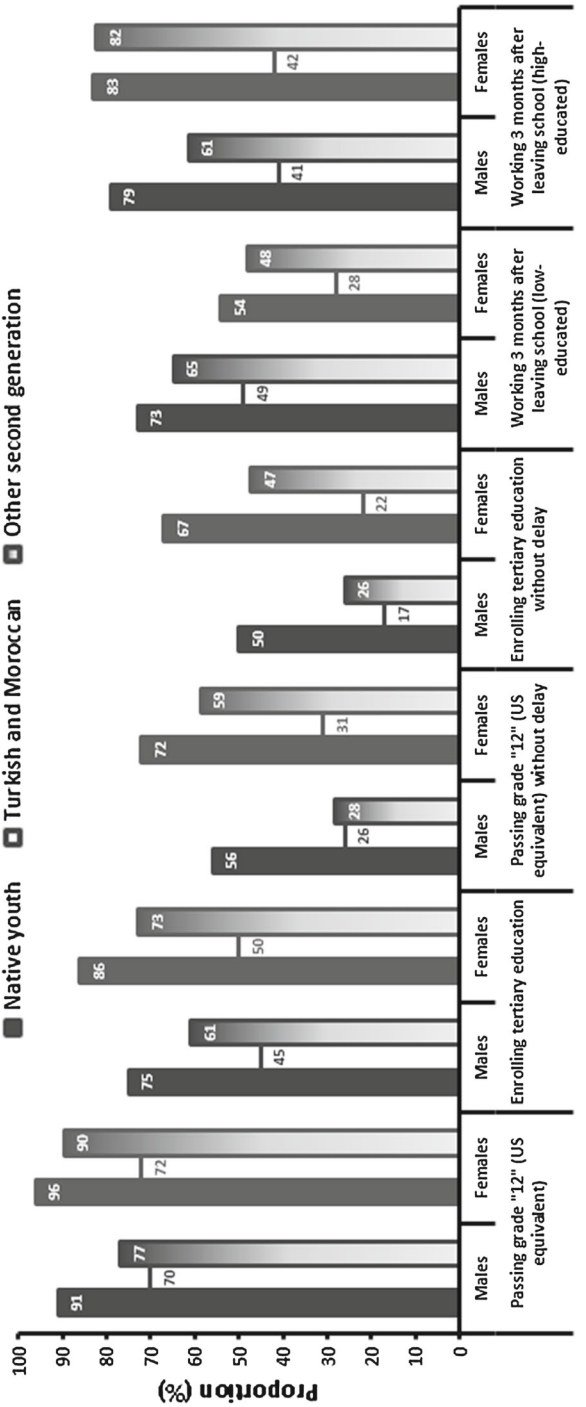

Fig. 1 Unadjusted schooling and school-to-work transition outcomes by immigrant status and gender

Although expected given the disadvantaged backgrounds of immigrants discussed in Sect. 3.2, the size of these gaps is noteworthy. For example, the native-immigrant gap in graduating from secondary education without delay (third presented outcome in Fig. 1) is around 30 percentage points for Turkish and Moroccan men (i.e. 56 − 26 %), 28 percentage points for other immigrant men, 40 percentage points for Turkish and Moroccan women and 13 percentage points for other immigrant women. The gaps in enrolling in tertiary education without delay are also very large: 24–33 percentage points for men and 20–45 percentage points for women, with the largest gaps found for Turks and Moroccans.

Table 2 summarizes our main results. It presents the simulated total and residual ethnic gaps by gender, based on the procedures described in Sect. 3.3, for the Turkish and Moroccan second generation (Panel A) and, for completeness, for the entire immigrant second generation (Panel B). We do not discuss the results in Panel B because they are, with the exception of residual gaps in on-time schooling for immigrant males, dampened versions of the results in Panel A (i.e. the differentials are reduced by including an "intermediate" or native-like group in the immigrant category).[8]

Column (1) and Column (3) of Table 2 present the total ethnic gaps among male and female pupils, respectively, in terms of log odds ratios, following Eq. (1) in Sect. 3.3. Positive estimates imply that immigrant youth are lagging behind with respect to the educational and labor market outcomes. Because $\boldsymbol{log(1+x)} \cong \boldsymbol{x}$, these log odds ratios approximate proportional gaps between natives and immigrants. Column (2) and Column (4) present the corresponding residual gaps simulated by setting family background factors ("endowments") for natives to the levels of the immigrant group.[9] The gender difference in the total and residual native-immigrant gaps is presented in Column (5) and Column (7), respectively. As the simulated gaps for males and females are based on different model estimations, standard significance analysis of the gender differences is not possible. Therefore, we follow Keith (2006) and calculate (and discuss) z-scores by dividing Column (5) and Column (7) by the square root of the sum of the squared male and female standard errors for the respective gaps. These z-scores are presented in Column (6) and Column (8) of Table 2. Keith (2006) interprets a value lower than 0.05 as too small to be considered meaningful, a value between 0.05 and 0.10 as small but meaningful, a value between 0.10 and 0.25 as indicating a moderate difference and a value of 0.25 or greater as a large difference.

We find little evidence of a residual ethnic gap for second-generation Moroccan and Turkish men in passing secondary education, though we find a modest female gap that is statistically significant (first row of Panel A). The z-score values in Column (8) indicate that the gender difference in this first outcome is, statistically speaking, meaningful. Since native females far outperform native males in educational attainment, the

[8] As mentioned in Sect. 3.3, due to sample size limitations, the method used differs between these two panels. For Panel B, we estimate four models for four sub-samples (natives and immigrants, males and females) while for Panel A, we estimate only two models for two subsamples (natives and Turks/Moroccans) and include a gender dummy variable in each model, yielding a more restrictive specification. To test the sensitivity of the results to using this more restrictive specification, we also estimated the more restricted version for the larger sample (all immigrants). Appendix Table 5 compares the results. The estimated residual gaps are quite similar using the two modeling approaches.

[9] Results based on setting immigrant endowments to native levels are similar and available from the authors.

Table 2 Simulated total ethnic gaps and residual ethnic gaps with family background set to immigrant levelsa [log odds: native/immigrant]

	A. Natives versus Turkish and Moroccan second generation							
	A1. Ethnic gaps, males		A2. Ethnic gaps, females		A3. Gender difference in total ethnic gap		A4. Gender difference in residual ethnic gap	
	Total (1)	Residual (2)	Total (3)	Residual (4)	(3)–(1) (5)	z[b] (6)	(4)–(2) (7)	z (8)
Passing secondary education	0.27	−0.02	0.29	0.12*	0.02	0.16	0.14	1.06
Starting tertiary education	0.52	−0.23	0.54	0.11	0.02	0.10	0.34	1.64
Passing secondary education w/out delay	0.77	0.30*	0.85	0.55*	0.08	0.30	0.25	0.92
Starting tertiary education w/out delay	1.05	0.09	1.11	0.52*	0.06	0.20	0.43	1.40
Employed w/in 3 months of leaving school, no more than secondary education	0.39	0.30*	0.68	0.64*	0.29	1.16	0.34	1.33
Employed w/in 3 months of leaving school, no delay, higher education degree	0.66	0.56*	0.62	0.85*	−0.04	−0.13	0.29	0.96

Table 2 continued

	B. Natives versus immigrant second generation (all)							
	B1. Ethnic gaps, males		B2. Ethnic gaps, females		B3. Gender difference in total ethnic gap		B4. Gender difference in residual ethnic gap	
	Total (1)	Residual (2)	Total (3)	Residual (4)	(3) – (1) (5)	z (6)	(4) – (2) (7)	z (8)
Passing secondary education	0.23	0.11*	0.19	0.05*	−0.04	−0.18	−0.06	−0.27
Starting tertiary education	0.36	−0.01	0.39	0.05*	0.03	0.12	0.06	0.23
Passing secondary education w/out delay	0.73	0.49*	0.55	0.28*	−0.18	−0.42	−0.21	−0.48
Starting tertiary education w/out delay	0.89	0.40*	0.74	0.24*	−0.15	−0.36	−0.16	−0.38
Employed w/in 3 months of leaving school, no more than secondary education	0.25	0.16	0.42	0.43*	0.17	0.70	0.27	1.07
Employed w/in 3 months of leaving school, no delay, higher education degree	0.46	0.36*	0.30	0.31*	−0.16	−0.45	−0.05	−0.14

* $p < 0.05$; $+ 0.05 \leq p < 0.10$

[a] The sample size of (fe)male natives (for which no family background characteristics were missing) is 3,698 (3,558), the sample size of (fe)male Turkish and Moroccan second generation immigrants is 92 (117) and the sample size of all (fe)male immigrants of the second generation is 165 (194). One should take in mind that we observe (and model) multiple observations for each individual. Covariates include mother's education level, father's education level, number of siblings, day of birth within the calendar year, speaking Dutch in the parental home and the (time-varying) unemployment rate. See Sect. 3.3 for a discussion of the unobserved heterogeneity modeling

[b] z-scores are calculated by dividing Column (5) and Column (7) by the square root of the sum of the squared male and female standard errors for the respective gaps

modest ethnic gap among females does not constitute a "double penalty" for immigrant females; in other words, immigrant women outperform their male counterparts but by less than native women outperform native males.

Ethnic gaps in starting tertiary education (second row of Panel A) are modest and neither for males nor for females statistically significant. However, the signs of the male and female gaps are different: there is a suggestion that immigrant men (women) are more (less) likely to start tertiary education than natives of similar family socioeconomic background. As a result, the z-score in Column (8) indicates that the gender difference is not-negligible and, again, to the detriment of the female pupils.

The story in terms of gender differences is the same when on-time status is considered. Residual gaps between natives and Turkish and Moroccan men and women in completing secondary education without delay are 0.30 and 0.55 respectively, and are statistically significant. In addition, the residual ethnic gap in starting tertiary education without delay is large (0.52) and significant only for females.

Unlike schooling gaps, there is little difference between the total and residual gaps in school-work transitions. In other words: the total gap in school-to-work transitions cannot be explained by observed family endowments but represents a substantial residual (so "pure ethnic") gap. Conditional on educational attainment, family socioeconomic background differences between natives and immigrants do not drive differences in their employment as would be expected, for example, if higher-status family connections were the key to securing a job. Interestingly, the residual ethnic gaps (natives versus Turks/Moroccans) for finding employment 3 months after leaving school are large for both men and women, though much larger for women.[10] For finding work after leaving secondary education, the gaps are 0.30 for men versus 0.64 for women. For finding work after higher education without delay, the residual ethnic gap is 0.56 for men and 0.85 for women. For the less-educated group, this larger gap for minority women *does* represent a "double penalty" since less-educated native women lag less-educated native men in securing employment. This is not the case for the more-educated, where native females transition from school to work more quickly than native males.

Clearly, our general finding of larger native-immigrant gaps for females does not corroborate that of Dronkers and Kornder (2014). This may be due to the different outcome variables (general educational attainment versus test scores), the different institutional setting (Flanders versus a cross-country perspective) and the different econometric approach (dynamic discrete choice modelling taking into account selection on strictly exogenous individual observables and on unobservables versus linear regressions on an extensive set of observed background controls; we come back to this in the following paragraph). On the other hand, our finding of large residual employment gaps for females squares with Glorieux and Laurijssen (2009) who link this finding to cultural differences: "The fact that it is particularly women of North-

[10] We also estimated models to examine an alternative outcome: employed with a permanent contract 2 years after leaving school. The point estimates of immigrant (all)-native gaps, presented in Appendix Table 6, are broadly consistent with those reported in Table 2, Panel B, although significance levels change, with some estimates reaching significance at the 5 % level and others losing it.

African and Turkish descent and not the men that have difficulty in accessing the labor market, rather points in the direction of the cultural explanation."

Finally, we investigate the impact of modeling unobserved heterogeneity for our results. We present coefficient estimates from specifications with and without modeling unobserved heterogeneity in Appendix Table 7. The table reports the estimated coefficients of the gender dummy variable in the educational and labor market transition model, separately for Turkish and Moroccan immigrants and for natives. These results suggest little unobserved heterogeneity bias in the compulsory schooling years (primary and secondary education), since the coefficients are similar at the early transitions whether or not unobserved heterogeneity is modeled. In contrast, there is evidence of heterogeneity bias in transitions in tertiary education, as evidenced by differences in gender coefficients across the models, especially for natives. In addition, heterogeneity bias is large in school-work transition success; not controlling for unobserved endowments produces underestimates of the female disadvantage in labor market success.

4.2 Demographic Behaviors as Cultural Mechanisms Underlying the Gender Differences

In this subsection, we explore demographic behaviors as an explanation for our main finding of higher residual ethnic performance gaps in school and in the youth labor market among females. As mentioned in the introduction, hypotheses about sociocultural factors underlying gender differences in educational and labor market outcomes suggest an important role for demographic behaviors such as fertility or marriage timing. Specifically, immigrants' traditional gender-role norms are thought to increase second-generation female responsibilities in the home, reduce investments in their education and their labor market participation, relative to second-generation males, and relative to the native gender gaps in these outcomes. We know of no attempts to test these mechanisms empirically.

In principle, demographic behaviors could be included as intervening variables in models similar to those we estimated above. However, demographic behaviors are clearly endogenously determined with education, and there are no obvious candidates for valid instrumental variables to identify their causal effects on educational attainment and employment. And, although SONAR collected attitudinal data that might be informative about gender-role differences between natives and immigrants, this information was collected only in the later waves of the survey, greatly increasing the scope for reverse effects (i.e. measured attitudes that are adaptive to or rationalize behaviors ex post facto). Therefore, rather than attempt a (problematic) incorporation of potentially endogenous attitudinal and demographic behavioral variables in models of education and employment, we take a more modest (exploratory) approach and simply estimate models to describe demographic behaviors as outcome variables using the same set of exogenous explanatory variables capturing family background as in our main econometric analysis.

Table 3 provides descriptive information (not adjusted for family background) on demographic outcomes as of age 23. The demographic behavior by age 23 of the

Table 3 Demographic behaviors as cultural mechanisms: descriptive statistics [proportions]

Variable	Males			Females		
	Native	Second Generation		Native	Second Generation	
		Turkish and Moroccan	Other		Turkish and Moroccan	Other
By age 23, % ever…?						
Left parent home	23.5	19.5	16.4	38.3	54.7	41.6
Financially independent	53.4	67.4	47.9	58.0	66.6	61.0
Married	3.8	40.2	5.5	11.3	51.3	15.6
Cohabited (married or not)	24.4	44.6	13.7	42.9	57.3	42.9
Cohabited before married	22.9	10.9	9.6	38.3	13.7	31.2
Had a child	3.8	21.7	2.7	9.2	40.1	11.7
Had a 2nd child	0.5	3.3	0.0	2.4	9.4	2.6
Birth @ age <18	0.2	1.1	0.0	0.5	0.9	0.0
Birth @ age <20	1.0	2.2	1.4	1.5	9.4	1.3
Sample size (maximum)	3718	92	73	3558	118	78

Turkish and Moroccan second generation, especially women, is clearly distinct from natives and other immigrants. Turkish and Moroccan second-generation women are far more likely to have left the parental home (55 % compared to 38 % of natives and 42 % of other immigrants). Turkish and Moroccan men are slightly less (more) likely than native (other immigrant) males to have left home by age 23. In addition, Turkish and Moroccan men and women are somewhat more likely than other men and women to report that they are financially independent (second row).

The most dramatic ethnic differences relate to marriage behavior. Among the Turkish and Moroccan second generation, 51 % of women and 40 % of men have married by age 23, compared to 11 % of native women, 16 % of other immigrant females, and 4–6 % of other males. These differences for second-generation migrants may relate to the fact that Flanders' migration policies (family reunification and marriage migration) discussed in Sect. 2.3 may have strengthened ethnic networks and, as a consequence, the intergenerational transmission of traditional norms and behavior (such as early marriage). The corresponding gap in cohabitation (marital or non-marital) is smaller but still substantial. An explanation for the larger marriage gap is given by the fifth row of Table 3: the proportion of individuals who cohabited before marriage is substantially lower for Turkish and Moroccan males and females compared to their native counterparts.

Fertility behavior also differs by ethnicity. Fully 40 % of Turkish and Moroccan women and 22 % of Turkish and Moroccan men have had a first child by age 23, compared to less than 12 % of other immigrant women and less than 3 % of other men (sixth row). Nearly all these births occur between age 20 and 23. There is virtually no fertility before age 18, and even by age 20 only 9 % of Moroccan and Turkish women and 2 % of Moroccan and Turkish men have had first births. Thus, the gaps in sec-

ondary education documented earlier do not appear to result from direct disruptions from early births, though births in the early 20s may account for gaps in tertiary education. However, expectations of marriage or fertility could certainly affect educational investments at younger ages.

Table 4 shows results (marginal effects) from logistic regression with multivariate controls. For each outcome we estimate three models using increasingly rich sets of (family background) control variables: (i) controls for cohort dummy only; (ii) cohort dummies plus socioeconomic controls (parent's education captured by seven dummies each for mother's and father's educational category, number of siblings and a dummy for delayed start of school); and (iii) cohort dummies plus socioeconomic controls and an additional control for Dutch spoken in the parental home. These family background controls are the same as those used in our main analyses presented in the previous subsection.

For the most part, although there are large differences between Turkish and Moroccan second-generation youths and natives in demographic outcomes when we adjust only for cohort (model i), very few differences remain large and statistically significant after controls are added for the socioeconomic background variables listed in the former paragraph (model ii). Exceptions include leaving the parental home (for men), marriage (for men and women) and cohabitation before marriage (for men and women). Specifically, after adding all controls, native males are more likely to leave the parental home by age 23 than Turkish and Moroccan immigrants (20 percentage points) or other immigrant groups (14 percentage points). Turkish and Moroccan women are 13 percentage points more likely, and Turkish and Moroccan men are 9 percentage points more likely, to marry by age 23 than their native same-gender counterparts, controlling for socioeconomic background and the use of Dutch in the parental home. Interestingly, after SES controls there are no sizable or significant differences in cohabitation (marital or non-marital). Again, the latter finding can be explained by the fact that both Turkish and Moroccan and other second-generation immigrants are less likely to cohabit before marriage (potentially due to the aforementioned more traditional norms among migrant families).

If we interpret the role of marriage in education and employment as indicating a gender-role *cultural* difference linked to responsibilities for children, the evidence for this hypothesis is decidedly mixed. This is shown in the next three panels of Table 4 where we present results for models of fertility. Although unadjusted (other than cohort) ethnic gaps in having a birth by age 23 are large (0.17 for women and 0.08 for men), after adjusting for socioeconomic background and use of Dutch, the ethnic gap becomes quite modest (0.02 for Turkish and Moroccan women and men versus their native counterparts) and is not significant for women. Disadvantaged socioeconomic background can account for the vast majority of the ethnic fertility difference without invoking cultural factors. In order to explore whether the fertility and marriage results are sensitive to our modeling choice (logistic regression) or the specific age cut-offs for the outcomes (age 18, age 20 and age 23), we estimated Cox proportional hazard models for first marriage and first birth. The results of these analyses can be found in Appendix Table 8. Qualitatively, results are very similar to the corresponding results reported in Table 4.

Table 4 Demographic behaviors as cultural mechanisms: logit models[a] [marginal effects (SEs)]

Outcomes/controls[2]	Males		Females	
	Turkish and Moroccan	Other second generation	Turkish and Moroccan	Other second generation
Leave parental home				
1. Cohort only	−0.05 (0.05)	−0.09+ (0.06)	0.14* (0.04)	−0.00 (0.05)
2 = 1+ SES background	−0.20* (0.05)	−0.14* (0.06)	−0.02 (0.05)	−0.07 (0.05)
3 = 2+ Dutch at home	−0.20* (0.05)	−0.14* (0.06)	−0.03 (0.05)	−0.08 (0.05)
Financial independence				
1. Cohort only	0.15* (0.05)	−0.05 (0.06)	0.09+ (0.05)	0.03 (0.06)
2 = 1+ SES background	−0.02 (0.06)	−0.11+ (0.06)	−0.04 (0.05)	−0.04 (0.06)
3 = 2+ Dutch at home	−0.01 (0.06)	−0.10+ (0.06)	−0.03 (0.05)	−0.03 (0.06)
Marry				
1. Cohort only	0.12* (0.01)	0.02 (0.02)	0.23* (0.02)	0.04 (0.03)
2 = 1+ SES background	0.10* (0.01)	0.01 (0.02)	0.13* (0.02)	−0.00 (0.03)
3 = 2+ Dutch at home	0.09* (0.01)	0.01 (0.02)	0.13* (0.02)	−0.01 (0.03)
Cohabit (married or not)				
1. Cohort only	0.16* (0.04)	−0.14* (0.06)	0.14* (0.05)	−0.01 (0.06)
2 = 1+ SES background	0.05 (0.04)	−0.18* (0.06)	−0.01 (0.05)	−0.08 (0.06)
3 = 2+ Dutch at home	0.05 (0.05)	−0.17* (0.06)	−0.02 (0.05)	−0.09 (0.06)
Outcomes/controls[b]	Males		Females	
	Turkish and Moroccan	Other second generation	Turkish and Moroccan	Other second generation
Cohabit before marry				
1. Cohort only	−0.16* (0.06)	−0.19* (0.07)	−0.32* (0.06)	−0.01 (0.06)
2 = 1+ SES background	−0.27* (0.06)	−0.22* (0.07)	−0.40* (0.07)	−0.13* (0.06)
3 = 2+ Dutch at home	−0.26* (0.06)	−0.21* (0.07)	−0.40* (0.05)	−0.12* (0.06)
Birth by age 23				
1. Cohort only	0.08* (0.01)	−0.01 (0.03)	0.17* (0.02)	0.02 (0.03)
2 = 1+ SES background	0.03* (0.01)	−0.03 (0.03)	0.03 (0.02)	−0.05 (0.03)
3 = 2+ Dutch at home	0.02+ (0.01)	−0.03 (0.03)	0.01 (0.02)	−0.06+ (0.03)
Birth before age 18				
1. Cohort only	0.00 (0.01)	–[c]	0.00 (0.01)	–[c]
2 = 1+ SES background	−0.00 (0.01)	–[c]	−0.01 (0.01)	–[c]
3 = 2+ Dutch at home	−0.01 (0.01)	–[c]	−0.01 (0.01)	–[c]

Table 4 continued

Outcomes/controls[b]	Males		Females	
	Turkish and Moroccan	Other second generation	Turkish and Moroccan	Other second generation
Birth before age 20				
1. Cohort only	0.01 (0.01)	0.00 (0.01)	0.03* (0.01)	−0.00 (0.02)
2 = 1+ SES background	−0.01 (0.01)	−0.00 (0.01)	0.00 (0.01)	−0.02 (0.02)
3 = 2+ Dutch at home	−0.01 (0.01)	−0.01 (0.01)	0.00 (0.01)	−0.02 (0.02)
Sample size	3863		3752	

* $p < 0.05$; + $0.05 \leq p < 0.10$

[a] The sample size of (fe)male natives (for which no family background characteristics were missing) is 3,698 (3,558), the sample size of (fe)male Turkish and Moroccan second generation immigrants is 92 (117) and the sample size of all (fe)male immigrants of the second generation is 165 (194). One should take in mind that we observe (and model) multiple observations for each individual

[b] Controls are: "Cohort": 2 dummies to indicate 3 birth cohorts. "SES background": number of siblings, and dummy variables for delayed start of school, mother's (7 dummies) and father's (7 dummies) educational category beyond age 12. "Dutch at home": dummy variable for speaking Dutch in the parental home

[c] Coefficients could not be estimated due to lack of variation in the outcome for this population.

4.3 Other Potential Mechanisms Underlying the Gender Differences

In this subsection, we discuss mechanisms other than those explored in Sect. 4.2 that may explain the gender differences in ethnic gaps in educational and first labor market outcomes found for Flanders.

An important alternative explanation for the (gender differences in) residual ethnic gaps in education and school-to-work transitions is discrimination. As mentioned above, Baert et al. (2015) found evidence for hiring discrimination against Turkish school-leavers by means of an audit study. As mentioned in the introduction, some have suggested that discrimination alone would predict a greater ethnic employment gap among men than women (Timmerman et al. 2003, p. 1080; Glorieux and Laurijssen 2009, p. 9), which is inconsistent with our findings. Still, given the evidence of large (unadjusted) ethnic differences in early fertility and marriage, the possibility remains that Turkish and Moroccan women face statistical discrimination in the transition to employment related to employers' expectations of their early marriage and family formation. As a result, it may be difficult to disentangle the culture and discrimination explanations for residual ethnic gaps.[11]

Our econometric approach allowed us to decompose the simulated total ethnic gaps, which approximated the observed gaps, into ethnic differences in observed endowments and a residual "pure ethnic" gap. As we were able to control only for a limited set of exogenous observed endowments capturing human capital, we cannot rule out that some unmeasured dimensions of human capital, orthogonal to those captured, partly drive the estimated residual gaps. By extension, we also cannot rule out that

[11] In a new study, Hartmann (2014), using longitudinal data for Germany, reached similar conclusions regarding gender differences in attainment of middle-class status among the Turkish second-generation.

(gender differences in) ethnic gaps in intergenerational transmission of human capital (see, e.g., Bauer and Riphahn 2007; Black et al. 2005; Blau et al. 2013; Bleakley and Chin 2008; Borjas 1992) may also drive our results.

Two final (potential) explanations for the residual ethnic gaps are ethnic differences in preferences and expectations such as risk aversion (Constant et al. 2010; Filippin 2009) and the role of ethnic networks and school segregation (Dustmann et al. 2010; Winters et al. 2001). The latter explanation is particularly relevant for the Flanders setting as (former) migration policies in the region may have strengthened ethnic networks and segregation instead of fostering integration and assimilation (Sect. 2.3). To the extent that these dynamics are more salient for female pupils, they might also explain our main results.

5 Conclusion

In this study we investigated gender differences in ethnic gaps in educational and initial labor market outcomes in Flanders, Belgium. To this end, we employed a unified statistical framework of educational and school-to-work transitions that accounts for selection on family background and educational sorting on unobservables. We found that second-generation Turkish and Moroccan youths lag natives in timely completion of secondary schooling, beginning tertiary education and in school-to-work transition, even after adjusting for differences in family socioeconomic background. These residual ethnic gaps are larger for women than men. For example, among less-educated persons, native males are approximately 30 % more likely than Turkish and Moroccan males to be employed 3 months after leaving school, while the corresponding female employment gap is greater than 60 %. In addition, we showed that these gaps are consistent with substantial residual ethnic gaps in the transition to first marriage, though not in other demographic behaviors such as transition to a first birth or cohabitation.

Our conclusion at the end of the results section that it is difficult to disentangle the culture and discrimination explanations for residual ethnic gaps has implications for future research on ethnic employment gaps. First, it would be useful to repeat the aforementioned employment audit study of Baert et al. (2015) for a pool of female applicants with an emphasis on differences in ethnic discrimination by family processes (e.g., Correll et al. 2007). Second, because for education outcomes we found large residual ethnic education gaps in "on time" education only, studies are needed to establish the importance of timely progression in education for labor market and other economic outcomes. This would seem particularly important for Flanders since a substantial proportion of natives also complete education with delays.

Appendix

See Tables 5, 6, 7 and 8.

Table 5 Simulated total ethnic gaps and residual ethnic gaps with family background set to immigrant levels: comparison of results across two methods for estimating residual gaps[a] [log odds: native/immigrant]

	Natives versus Immigrant Second Generation (all)			
	Ethnic Gaps, Males		Ethnic Gaps, Females	
	Total (1)	Residual (2)	Total (3)	Residual (4)
A. Gender dummy variable included in models run separately for immigrants and natives men and women (two models/samples)				
Passing secondary education	0.23	0.02	0.19	0.10*
Starting tertiary education	0.36	−0.12	0.39	0.08
Passing secondary education w/out delay	0.73	0.30*	0.55	0.36*
Starting tertiary education w/out delay	0.89	0.18+	0.74	0.36*
Employed w/in 3 months of leaving school, no more than secondary education	0.25	0.19*	0.42	0.36*
Employed w/in 3 months of leaving school, no delay, higher education degree	0.46	0.27*	0.30	0.41*
B. Models run separately for natives and immigrants, men and women (four models/samples)				
Passing secondary education (US equivalent)	0.23	0.11*	0.19	0.05*
Starting tertiary education	0.36	−0.01	0.39	0.05*
Passing secondary education w/out delay	0.73	0.49*	0.55	0.28*
Starting tertiary education w/out delay	0.89	0.40*	0.74	0.24*
Employed w/in 3 months of leaving school, no more than secondary education	0.25	0.16	0.42	0.43*
Employed w/in 3 months of leaving school, no delay, higher education degree	0.46	0.36*	0.30	0.31*

* $p < 0.05$; $+\ 0.05 \leq p < 0.10$

[a] The sample size of (fe)male natives (for which no family background characteristics were missing) is 3698 (3558), the sample size of (fe)male Turkish and Moroccan second generation immigrants is 92 (117) and the sample size of all (fe)male immigrants of the second generation is 165 (194). One should take in mind that we observe (and model) multiple observations for each individual. Covariates include mother's education level, father's education level, number of siblings, day of birth within the calendar year, speaking Dutch in the parental home and the (time-varying) unemployment rate. See Sect. 3.3 for a discussion of the unobserved heterogeneity modeling

Table 6 Simulated total ethnic gaps and residual ethnic gaps with family background set to immigrant levels: comparison of results across two school-to-work outcomes[a] [log odds: native/immigrant]

	Natives versus immigrant second generation (all)			
	Ethnic gaps, males		Ethnic gaps, females	
	Total (1)	Residual (2)	Total (3)	Residual (4)
A. School-work outcome: permanent contract 2 years after leaving school				
Passing secondary education	0.23	0.10*	0.19	0.06*
Starting tertiary education	0.36	−0.02	0.39	0.05*
Passing secondary education w/out delay	0.73	0.49*	0.55	0.28*
Starting tertiary education w/out delay	0.89	0.41*	0.74	0.24*
Permanent contract 2 years after leaving school, no more than secondary education	0.59	0.61*	0.84	0.60
Permanent contract 2 years after leaving school, higher education degree, less than 1 year of delay	0.39	0.25	0.18	0.32
B. School-to-work outcome: employed 3 months after leaving school				
Passing secondary education	0.23	0.11*	0.19	0.05*
Starting tertiary education	0.36	−0.01	0.39	0.05*
Passing secondary education w/out delay	0.73	0.49*	0.55	0.28*
Starting tertiary education w/out delay	0.89	0.40*	0.74	0.24*
Employed w/in 3 months of leaving school, no more than secondary education	0.25	0.16	0.42	0.43*
Employed w/in 3 months of leaving school, no delay, higher education degree	0.46	0.36*	0.30	0.31*

* $p < 0.05; +0.05 \leq p < 0.10$

[a] The sample size of (fe)male natives (for which no family background characteristics were missing) is 3,698 (3,558), the sample size of (fe)male Turkish and Moroccan second generation immigrants is 92 (117) and the sample size of all (fe)male immigrants of the second generation is 165 (194). One should take in mind that we observe (and model) multiple observations for each individual. Covariates include mother's education level, father's education level, number of siblings, day of birth within the calendar year, speaking Dutch in the parental home and the (time-varying) unemployment rate. See Sect. 3.3 for a discussion of the unobserved heterogeneity modeling

Table 7 Effects of modeling unobserved heterogeneity on female dummy variables in models of educational attainment and school-work transitions, Turkish and Moroccan immigrants and natives[a] [coefficients (SEs)]

Transition (outcome)	Turkish and Moroccan		Natives	
	Not modeling unobserved heterogeneity	Modeling unobserved heterogeneity	Not modeling unobserved heterogeneity	Modeling unobserved heterogeneity
Delay start of primary education	−0.15 (0.56)	−0.16 (0.56)	0.17(0.16)	0.16 (0.16)
Delay start of secondary education	0.62* (0.17)	0.69* (0.20)	0.61* (0.04)	0.61* (0.04)
Passing a year in secondary education	0.05 (0.32)	0.44 (0.43)	0.37* (0.04)	0.38* (0.04)
Continue school at end of year in secondary education	−0.73* (0.33)	−0.71* (0.35)	−0.37* (0.06)	−0.37* (0.06)
Passing year in tertiary education	0.49 (0.30)	0.46 (0.31)	−0.30* (0.09)	−0.28* (0.09)
Continue school at end of year in tertiary education	−0.27 (0.25)	−0.30 (0.26)	0.45* (0.07)	0.66* (0.09)
Employed 3 months after leaving school	−0.23 (0.32)	−1.66* (0.64)	−0.04 (0.04)	−0.45* (0.08)

* $p < 0.05$; $+\ 0.05 \leq p < 0.10$

[a] The sample size of (fe)male natives (for which no family background characteristics were missing) is 3698 (3558), the sample size of (fe)male Turkish and Moroccan second generation immigrants is 92 (117) and the sample size of all (fe)male immigrants of the second generation is 165 (194). One should take in mind that we observe (and model) multiple observations for each individual. Covariates include mother's education level, father's education level, number of siblings, day of birth within the calendar year, speaking Dutch in the parental home and the (time-varying) unemployment rate. See Sect. 3.3 for a discussion of the unobserved heterogeneity modeling

Table 8 Demographic behaviors as cultural mechanisms: Cox proportional hazard models (hazard ratios [95 % CI])

Outcomes/controls[a]	Males		Females	
	Turkish and Moroccan	Other second generation	Turkish and Moroccan	Other second generation
First marriage				
1. Cohort only	7.0* [5.4, 9.3]	1.5 [0.8, 2.7]	16.8* [11.6, 24.3]	1.4 [0.6, 4.1]
2 = 1+ SES background	3.3* [2.3, 4.7]	1.0 [0.6, 1.8]	9.8* [5.6,16.9]	1.3 [0.5, 3.4]
3 = 2+ Dutch at home	3.1* [2.1, 4.5]	1.0 [0.5, 1.7]	8.3* [4.7,14.8]	1.1 [0.4, 3.2]
First birth				
1. Cohort only	5.5* [4.0, 7.4]	1.3 [0.7, 2.6]	6.3 [4.0, 10.2]	0.7 [0.2, 3.0]
2 = 1+ SES background	1.2 [0.8, 1.9]	0.6 [0.3, 1.2]	1.8+ [1.0,3.2]	0.5 [0.1, 1.8]
3 = 2+ Dutch at home	1.1 [0.7, 1.7]	0.6+ [0.3, 1.1]	1.6 [0.8,3.0]	0.4 [0.1, 1.8]
Sample size	3863		3752	

* $p < 0.05$; + $0.05 \leq p < 0.10$

[a] Controls are: "Cohort": 2 dummies to indicate 3 birth cohorts. "SES background": number of siblings, and dummy variables for delayed start of school, mother's (7) and father's (7) educational category beyond age 12. "Dutch at home": dummy variable for speaking Dutch in the parental home

References

Andersson, G., Obucina, O., & Scott, K. (2015). Marriage and divorce of immigrants and descendants of immigrants in Sweden. *Demographic Research*, *33*, 31–64.

Baert, S., & Cockx, B. (2013). Pure ethnic gaps in educational attainment and school to work transitions: When do they arise? *Economics of Education Review*, *36*, 276–294.

Baert, S., Cockx, B., Gheyle, N., & Vandamme, C. (2015). Is there less discrimination in occupations where recruitment is difficult? *ILR Review*, *68*, 467–500.

Bauer, P., & Riphahn, R. T. (2007). Heterogeneity in the intergenerational transmission of educational attainment: Evidence from Switzerland on natives and second-generation immigrants. *Journal of Population Economics*, *20*, 121–148.

Black, S. E., Devereux, P. J., & Salvanes, K. G. (2005). Why the apple doesn't fall far: Understanding intergenerational transmission of human capital. *American Economic Review*, *95*, 437–449.

Blau, F. D., Kahn, L. M., Liu, A. Y.-H., & Papps, K. L. (2013). The transmission of women's fertility, human capital, and work orientation across immigrant generations. *Journal of Population Economics*, *26*, 405–435.

Bleakley, H., & Chin, A. (2008). What holds back the second generation? The intergenerational transmission of language human capital among immigrants. *Journal of Human Resources*, *43*, 267–298.

Borjas, G. J. (1992). Ethnic capital and intergenerational mobility. *Quarterly Journal of Economics*, *107*, 123–150.

Cameron, S. V., & Heckman, J. J. (1998). Life cycle schooling and dynamic selection bias: Models and evidence for five cohorts of american males. *Journal of Political Economy*, *106*, 262–333.

Cameron, S. V., & Heckman, J. J. (2001). The dynamics of educational attainment for black, Hispanic and white males. *Journal of Political Economy*, *109*, 455–499.

Card, D. (2005). Is the new immigration really so bad? *Economic Journal*, *115*, 300–323.

Chiswick, B. R., & DebBurman, N. (2004). Educational attainment: Analysis by immigrant generation. *Economics of Education Review*, *23*, 361–379.

Constant, A. F., Krause, A., Rinne, U., & Zimmermann, K. F. (2010). Economic preferences and attitudes of the unemployed: Are natives and second generation migrants alike? *International Journal of Manpower*, *32*, 825–851.

Correll, S. J., Benard, S., & Paik, I. (2007). Getting a job: Is there a motherhood penalty? *American Journal of Sociology*, *112*, 1297–1338.
De Valk, H. A. G., & Liefbroer, A. C. (2011). Timing preferences for women's family-life transitions: Intergenerational transmission among migrants and Dutch. *Journal of Marriage and the Family*, *69*, 190–206.
Dronkers, J., & Kornder, N. (2014). Do migrant girls perform better than migrant boys? Deviant gender differences between the reading scores of 15-year-old children of migrants compared to native pupils. *Educational Research and Evaluation*, *20*, 44–66.
Dronkers, J., & Kornder, N. (2015). Can gender differences in educational performance of 15-year-old migrant pupils be explained by society gender equality in origin and destination countries? *Compare: A Journal of Comparative and International Education*, *45*, 610–634.
Dustmann, C., Frattini, T., & Lanzara, G. (2012). Educational achievement of second-generation immigrants: An international comparison. *Economic Policy Journal*, *27*, 143–185.
Dustmann, C., Machin, S., & Schönberg, U. (2010). Ethnicity and educational achievement in compulsory schooling. *Economic Journal*, *120*, 272–297.
East, P. L. (1998). Racial and ethnic differences in girls' sexual, marital, and birth expectations. *Journal of Marriage and the Family*, *60*, 150–162.
Eckstein, Z., & Wolpin, K. I. (1998). Estimating the effect of racial discrimination on first job wage offers. *Review of Economics and Statistics*, *81*, 384–392.
Filippin, A. (2009). *Can workers' expectations account for the persistence of discrimination?* IZA discussion papers, 4490.
Fleischmann, F., & Kristen, C. (2014). Gender inequalities in the education of the second generation in Western countries. *Sociology of Education*, *87*, 143–170.
Glick, J. E., Ruf, S. D., White, M. J., & Goldscheider, F. (2006). Educational engagement and early family formation: Differences by ethnicity and generation. *Social Forces*, *84*, 1391–1415.
Glorieux, I., & Laurijssen, I. (2009). *The labor market integration of ethnic minorities in Flanders*. Brussels: Department of Sociology, Research Group TOR, Vrije Universiteit Brussel.
Hagy, A. P., & Staniec, J. F. O. (2002). Immigrant status, race, and institutional choice in higher education. *Economics of Education Review*, *21*, 381–392.
Hartmann, J. (2014). Do second-generation Turkish migrants in Germany assimilate into the middle class? *Ethnicities*. http://etn.sagepub.com/content/early/2014/08/20/1468796814548234.abstract.
Heckman, J. J., & Singer, B. (1984). A method for minimizing the impact of distributional assumptions in econometric models for duration data. *Econometrica*, *52*, 271–320.
Hotz, V. J., McElroy, S. W., & Sanders, S. G. (2005). Teenage childbearing and its life cycle consequences: Exploiting a natural experiment. *Journal of Human Resources*, *40*, 683–715.
Huschek, D., de Valk, H. A. G., & Liefbroer, A. C. (2011a). Does social embeddedness influence union formation choices among the Turkish and Moroccan second generation in The Netherlands? *Journal of Comparative Family Studies*, *42*, 787–808.
Huschek, D., de Valk, H. A. G., & Liefbroer, A. C. (2011b). Gender-role behavior of second-generation Turks: The role of partner choice, gender ideology and societal context. *Advances in Life Course Research*, *16*, 164–177.
Huschek, D., Liefbroer, A. C., & de Valk, H. A. G. (2011c). Timing of first union among second-generation Turks in Europe: The role of parents, peers and institutional context. *Demographic Research*, *22*, 473–504.
Keith, T. Z. (2006). *Multiple regression and beyond*. Boston: Allyn and Bacon.
Kulu, H., & Gonzalez-Ferrer, A. (2014). Family dynamics among immigrants and their descendants in Europe: Current research and opportunities. *European Journal of Population*, *30*, 411–435.
Künn-Nelen, A., de Grip, A., & Fouarge, D. (2015). The relation between maternal work hours and the cognitive development of young school-aged children. *De Economist*, *163*, 203–232.
Lesthaeghe, R., & Surkyn, J. (1995). Heterogeneity in social change: Turkish and Moroccan women in Belgium. *European Journal of Population*, *11*, 1–29.
Ortiz, E. A., & Dehon, C. (2008). What are the factors of success at university? A case study in Belgium. *Cesifo Economic Studies*, *54*, 121–148.
Pailhe, A. (2015). Partnership dynamics across generations of immigration in France: Structural vs. cultural factors. *Demographic Research*, *33*, 451–498.
Pelfrene, E., Doyen, G., & Hellemans, I. (2009). *Immigration and migrant integration policies in Flanders (Belgium)*. Brussels: Research Center for the Flemish Government.

Prokic-Breuer, T., & Dronkers, J. (2012). *The high performance of Dutch and Flemish 15-year-old native pupils: Explaining country differences in math scores between highly stratified educational systems*. Maastricht University School of Business and Economics, working papers, 12/038.
Reniers. (1999). http://onlinelibrary.wiley.com/doi/10.1111/1468-2435.00090/abstract.
Ryan, P. (2001). The school-to-work transition: A cross-national perspective. *Journal of Economic Literature*, *39*, 767–767.
Sobotka, T. (2008). The rising importance of migrants for childbearing in Europe. *Demographic Research*, *19*, 225–247.
South, S. J. (2001). The variable effects of family background on the timing of first marriage: United States, 1969–1993. *Social Science Research*, *30*, 606–626.
Timmerman, C., Vanderwaeren, E., & Crul, M. (2003). The second generation in Belgium. *International Migration Review*, *27*, 1065–1090.
Timmerman, C., Lodewyckx, I., & Wets, J. (2009). Marriage at the intersection between tradition and globalization: Turkish marriage migration between Emirdag and Belgium from 1989 to present. *History of the Family*, *14*, 232–44.
Trilla, C. C., Esteve, A., & Domingo, A. (2008). Marriage patterns of the foreign-born population in a new country of immigration: The case of Spain. *International Migration Review*, *42*, 877–902.
Van Zantvliet, P. I., Kalmijn, M., & Verbakel, E. (2014). Parental involvement in partner choice: The case of Turks and Moroccans in the Netherlands. *European Sociological Review*, *30*, 387–398.
Winters, P., de Janvry, A., & Sadoulet, E. (2001). Family and community networks in Mexico-U.S. migration. *Journal of Human Resources*, *36*, 159–184.