# Gender Differences in Residential Mobility:
# The Case of Leaving Home
# in East Germany

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## Abstract

This study uses geo-coded data from 11 waves (2000 – 2010) of the SOEP to investigate gender differences in the spatial mobility of $N = 2,072$ young adults initially leaving their parental home. In West Germany, we find no gender differences in moving distances. In East Germany, young women are considerably more mobile than men. Almost 30% of East German women move across 100 km or more, compared to only 18% of East German men. The multivariate models reveal that these differences are not explained by the gender gap in education. Instead, they are attributable to East German women's higher propensity of moving to West Germany.

## 1. Introduction

Since the reunification of East and West Germany in 1990 there has been an enduring interest in the increasing sex ratio (men per 100 women) in large parts of eastern Germany, especially in rural regions (Kröhnert / Vollmer, 2012). Today, many East German areas are populated by more than 125 men per 100 women – one of the highest sex ratios in Europe.

This pattern particularly concerns young adults aged 18 to 30. In this age group, most young adults leave their parental home to obtain tertiary education, move in with a partner, or enter the labor market. Thus, high sex ratios in East Germany might be partly due to gender differences in these *initial* migration decisions. Specifically, women in East Germany are known to reach higher levels of educational attainment than men. Numerous studies have shown that high education is, in turn, positively associated with spatial mobility (e.g., Malmberg / Pettersson, 2007). Thus, the gender gap in educational attainment might lead young women in East Germany to move across greater geographical distances whereas their male counterparts might be more likely to relocate within the same local community. Although gender differences in education represent

the most common explanation for high sex ratios in East Germany, this idea has not been addressed in empirical research.

The present study aims to close this gap by investigating gender differences in home leavers' moving distances. We use individual data on the spatial distances of more than 2,000 move-outs from the parental home observed between the years 2000 and 2010.

## 2. Theoretical Considerations and Previous Research

Leaving the parental home represents an important step in the transition to adulthood. One critical aspect of young adults' residential decision is *where* to relocate (Leopold et al., 2012).

According to standard economic theory, highly educated individuals are more likely to move across greater distances to obtain further education or to enter more specialized labor markets which offer higher returns to their human capital. Recent research has further suggested that highly educated individuals are less sensitive to the psychic costs of migration and thus more willing to move to a destination that differs culturally from their current place of residence (Bauernschuster et al., 2012). Another explanation that has been advanced in the literature is those with higher education are less risk averse (Hartog et al., 2002) which might also lead to a higher propensity of moving in general and of moving long-distance in particular (Jaeger et al., 2010; Bauernschuster et al., 2012). Empirically, these ideas are well-supported as educational levels have been found to be positively related to spatial distances from the parental home (e.g., Lawton et al., 1994).

In East Germany, young women reach considerably higher educational degrees than men (e.g., Kröhnert, 2009). Considering this educational advantage, the surplus of young males in Eastern regions might partly result from gender differences in geographical mobility after leaving the parental home.

This line of reasoning also prompts the question where young adults relocate after leaving economically disadvantaged Eastern regions. Demographic push–pull models of migration assume that individuals are pushed from declining areas and pulled to more attractive locations (DaVanzo, 1981). As the standard of living remains considerably lower in East Germany, it appears likely that many highly educated home leavers from the East will move to the West.

Research on migration flows between East and West Germany commonly uses aggregated data at district level. Kubis/Schneider (2007), for example, focus on the degree of urbanization and conclude that children from rural areas are generally pushed to cities. Although this pattern is also observed in West Germany, it is far more pronounced in the East. In line with these findings, Kröhnert/Vollmer (2012) posit that high levels of education represent the

main driving force behind young women's migration from East to West Germany.

## 3. Data and Methods

Since the year 2000, the German Socio-Economic Panel Study (SOEP) provides geo-coordinated data at household level allowing to calculate exact airline distances of residential moves. Thus, information about spatial distances of move-outs of the parental home is available across 11 waves (2000–2010) of panel data. We select a sample of $N = 2,072$ young adults aged 16 to 30 who left their parental home within this window of observation. The spatial distance of these move-outs is calculated from geographical coordinates as the exact airline distance in meters between the former (parental) household and the child`s new household.

In addition, we use information about migration destinations to distinguish between moves from East to West Germany or vice versa as well as internal migration within East or West Germany. Education is measured by dummy variables indicating different levels of German education certificates[1] and distinguishing between basic secondary school or less (up to 9 years of education), intermediate secondary school (10 or 11 years of education) and upper secondary school or higher (12 or more years of education).[2]

We focus on gender differences in (a) distances and (b) destinations of young adults' move-outs. As noted, we expect East German women to move across greater geographical distances and to be more likely to move to the West. According to theoretical considerations and previous research, these effects should be attributable to the gender gap in education. To test these hypotheses, we estimate two sets of models: First, we use ordinary least squares regression models to estimate spatial distances of move-outs. Subsequently, we estimate logistic regression models to analyze migration destinations, using a binary outcome variable indicating move-outs from East to West Germany. Both estimations proceed in two steps: First, we specify a model including only gender and controls; then we add young adults' education to the equation.

All models control for a variety of factors. At the individual level, we include age, age squared, and indicator variables for whether a non-coresident partner was present at the earlier wave) and whether the respondent had a migration background (first or second generation). At the family level, we control for

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[1] We focus only on education and do not include training in our measurement (e.g., by using the ISCED classification) because many young adults in our sample already leave the parental household shortly after finishing school.

[2] As there was a considerable amount of missing data, we imputed missing values using a background model that included all variables from the multivariate model and a number of auxiliary variables at family level (for details, see Leopold et al., 2012).

father's education, per-capita income of the parental household (linear and squared), living with only one parent, birth order, having an own child, and being pregnant. And at the community level, we include a dummy for whether the parental household was still located at the respondents' place of childhood, the district's youth unemployment rate and the district's degree of urbanization.[3]

# 4. Results

## Descriptive Results

Table 1 shows distributions of spatial distances of move-outs. The left column presents the overall distribution of moving distance. The conditional distributions separate the sample by the gender of home leavers and whether their migration originated in East or West Germany. In West Germany, we find no gender differences in moving distances. In contrast, the distributions in East Germany show a sizable gender gap: Young women from East Germany move across greater distances than men. For instance, the 50 and 75 percentiles of women's moving distances amount to approximately triple the distance of their male counterparts. Whereas male home leavers from the East do not differ markedly from the western sample, young women from East Germany move by far across the greatest distances. This distinctive pattern is also reflected by the share of young adults moving across distances of more than 50 km and more than 100 km. Young men from East Germany do not differ much from women and men in West Germany with regard to the share of home leavers moving across more than 50 km (approximately one in four) and more than 100 km (approximately one in five). Among East German women, both shares are considerably higher, with almost one in three undertaking long-distance moves from their parental home.

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[3] According to the definitions of the German Federal Institute for Research on Building, Urban Affairs and Spatial Development, we distinguish between four degrees of urbanization: *Nucleated towns* (more than 100,000 inhabitants), *urban hinterland* (urban areas with more than 150 people per square-kilometer), *rural hinterland* (urban areas with less than 150 people per square-kilometer) and *rural areas* (rural districts of more or less than 100 people per square-kilometer).

**Distributions of Moving Distance in East and West Germany[a]**

|  | Total<br>*N = 2,072* | West Germany | | East Germany | |
|---|---|---|---|---|---|
| Percentiles |  | Men<br>*n = 670* | Women<br>*n = 791* | Men<br>*n = 291* | Women<br>*n = 320* |
| 5% | 184 | 183 | 217 | 106 | 172 |
| 10% | 456 | 427 | 527 | 346 | 530 |
| 25% | 1,637 | 1,654 | 1,737 | 1,132 | 2,292 |
| 50% | 8,580 | 8,118 | 8,060 | 6,657 | 19,363 |
| 75% | 58,814 | 53,540 | 40,848 | 57,024 | 152,012 |
| 90% | 230,498 | 206,766 | 179,111 | 233,911 | 323,222 |
| 95% | 351,161 | 316,994 | 293,087 | 382,421 | 387,236 |
| % of moves across > 50 km | 26.6 | 25.4 | 22.9 | 27.5 | 37.6 |
| % of moves across > 100 km | 19.1 | 18.2 | 16.1 | 17.7 | 29.5 |

*Note:* SOEP, release 2011, own calculations. Analyses based on 30 sets of imputed data.
[a] Distance of first move-out of the parental household (in meters).

To further investigate these findings, we calculated the distribution of moving distances in East and West Germany taking into account the migration destinations (results not shown). These analyses revealed an *absence* of gender differences in moving distances (a) among East German home leavers who relocated in East Germany and (b) among East German home leavers who moved to West Germany. Instead, young women in East Germany are simply more likely than men to move to the West. Obviously, these moves involve, on average, greater spatial distances. In our study population, only 12.7% of the East German men (37 of 291) relocated in the West – compared to 24.1% of East German women (77 of 320).

### Multivariate Results

Are these two descriptive findings, East German women move farther and more often to West Germany, explained by the gender gap in education? To answer this question, we estimate three regression models presented in Tables 2 and 3.

Table 2 shows linear estimates predicting young adults' moving distance separately for East and West Germany. In line with the descriptive findings, Models 1a and 2a indicate greater moving distances of women in the East and no gender differences in the West.

To test whether the gender effect in the East is explained by higher educational attainment of women, we control for education in Model 1b. As ex-

pected, we find a positive effect of education on spatial mobility in both East and West Germany. Education, however, does not explain the gender difference in moving distance among East German home leavers.[4]

*Table 2*

**Ordinary Least Squares Regressions of Logarithmic Moving Distance**

| Variables | East Germany | | | | West Germany | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Model 1a | | Model 2a | | Model 1b | | Model 2b | |
| | B | SE B | B | SE B | B | SE B | B | SE B |
| Female (ref.: *male*) | .88 | .25*** | .70 | .25** | −.06 | .14 | −.16 | .13 |
| Education[a] (ref.: *low*) | | | | | | | | |
| Intermediate | | | .20 | .33 | | | .31 | .18[†] |
| High | | | 1.18 | .37** | | | 1.32 | .19*** |
| Control variables | Yes | | Yes | | Yes | | Yes | |
| N | 611 | | 611 | | 1461 | | 1461 | |
| $R^2$ | .09 | | .12 | | .09 | | .14 | |
| Adjusted $R^2$ | .07 | | .10 | | .08 | | .13 | |

*Note*: SOEP, release 2011, own calculations. Analyses based on 30 sets of imputed data.
  [a] low = basic secondary school; intermediate = intermediate secondary school; high = upper secondary school.
  Number of clusters: 474 in East Germany; 1091 in West Germany.
  Significance: [†] $p < 0.1$, *$p < .05$, **$p < .01$, ***$p < .001$.

As indicated by the descriptive evidence, the gender gap in moving distances can be attributed to women's higher propensity of moving to West Germany. Thus, we focus only on East German home leavers in Table 3 and present log-odds predicting migration to West Germany. We employ the *khb method* (Karlson et al., 2011) which allows comparing coefficients between nested models.[5] The reduced model, excluding education, resembles the descriptive finding: East German women are more likely to move to West Germany. Analyses

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  [4] The control variables (not shown in Table 2) show that in East Germany, young adults from rural areas move greater distances than those from more urban areas. In the West, urbanization did not predict moving distances. In contrast, the father's education and per-capita income of the parental household are positively associated with moving distances in the Western, but not in the Eastern sample of home leavers.

  [5] The khb method is a decomposition method allowing for cross-model comparisons of coefficients in nonlinear models. In nonlinear models, the decomposition into direct and indirect effects is not as straightforward as in linear models because the estimated coefficients depend on the error variance of the model. The khb method compares the estimated coefficients of the full model to those of a reduced model by rescaling the models, holding constant the error variance in both models.

based on aggregate data have suggested that these gender differences should be explained by their higher educational achievement (e.g., Schneider/Kubis, 2010). To test this contention, we control for education in the full model. Although education promotes spatial mobility, increasing the likelihood of moves to West Germany,[6] the gender effect remains sizeable and highly significant. Before controlling for education in the reduced model, for example, the estimated probability of moving to West Germany is 22.7% for women and 10.7% for men. After controlling for education in the full model, these probabilities amount to 22.1% and 11.1%, respectively.[7] Thus, despite a slight convergence, the gender gap remains substantial and largely unexplained by education.

*Table 3*

**Logistic Regression of Migration Destination: Moving from East to West Germany**

| Effect of gender | Model 3 | |
|---|---|---|
| | B | SE B |
| Reduced model[a] | .89 | .28*** |
| Full model[b] | .77 | .29** |
| Difference | .13 | .15 |
| Control variables | Yes | |
| *N* | 611 | |
| *McFadden's Pseudo R²* | .08 | |

*Note*: SOEP, release 2011, own calculations. Analyses based on 30 sets of imputed data.
Calculations based on the khb method (Karlson et al., 2011) using the Stata-Command khb (Kohler et al., 2011). Standard errors were calculated according to Rubin's rules (1987).
[a] Model with gender and control variables.
[b] Additionally controlling for education.
Number of clusters: 474.
Significance: [†] $p < 0.1$, *$p < .05$, **$p < .01$, ***$p < .001$.

## 5. Discussion

This paper used individual data to shed light on gender differences in the spatial mobility of home leavers in East Germany. Our results show that young women in East Germany move across the greatest distances upon leaving their parental home. This gender gap results from their higher propensity of moving to West Germany. Previous research using aggregated data has speculated that such a pattern is explained by the gender gap in education among young adults

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[6] The log-odds for high educational level are .95 (.46) and for intermediate educational level .78 (.43) against the reference group of low educational level.

[7] These probabilities were calculated with all controls fixed at their means.

in East Germany (e.g., Schneider/Kubis, 2010). We find that education increases the likelihood of moving across greater distances and from East to West Germany, corroborating human capital models as well as previous research that has reported a brain drain from East to West Germany (Arntz, 2010; Brücker/Trübswetter, 2004; Hunt, 2004). However, our individual data reveal that the gender effect is not explained by education and other relevant covariates.

This suggests that other factors motivate young East German women to undertake the – often long-distance – move to West Germany. Local partner markets represent one possible explanation. As women prefer partners with equal or higher levels of education, they might lack adequate options due to gender differences in educational attainment. This idea is supported by empirical research showing that East German women are more likely to enter unions with men from West Germany than vice versa (Kröhnert/Klingholz, 2007). Another factor might be the traditionally high female labor market participation in East Germany. Many East German women favor employment over family formation (Adler, 2004). Because demand in professions preferred by women is often low, particularly in rural areas of East Germany, they might consider moving to areas that offer them better occupational opportunities. With regard to their high educational attainment, the availability of universities might also influence young women's decisions to move to Western regions.

One limitation of this research is that we did not consider different pathways out of the parental household (i.e., to enter the labor market, to move in with a partner, to obtain further education, etc.) which might be related to gender as well as moving distances and destinations. We also consider it worthwhile to link individual data with a more comprehensive set of structural information (e.g., gender-specific local labor markets, availability of universities, local partner market) to understand why young women in East Germany are more mobile than men. Finally, it would be interesting to follow up home leavers and analyze their subsequent migration history. Are those who leave the region gone for good or do they return later in life?

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