Harmful effects of female commuting on partnership stability: selection or causation?

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Extended abstract

Introduction

Considerable commutes were found to undermine well-being and overall life-satisfaction in various European countries (Stutzer & Frey 2008; Drobnic et al. 2010). Furthermore, commuting is perceived to have negative outcomes on family live (Schneider et al. 2009). Recently, harmful effects on partnerships and families were found with German data, but exclusively if women commute: Female commuters are significantly less satisfied with their partnerships and family-life compared to other women, especially if children are in the household (Feldhaus & Schlegel 2013). Another study found that long-distance commuting of women endangers the stability of partnerships significantly (Kley 2012, forthcoming).

These findings support theoretical considerations about the spreading of stressful daily practices due to the high demands on spatial flexibility in modern labour markets into other areas of life (e.g. Sennett 1998). Harmful effects on partnerships and families seem to be channelled through the "triple burden" faced by working women with long commutes and household responsibilities. But so far there are very few studies in this field. Those findings might be spurious due to biased samples, confounding of predictors and/or small numbers of cases. The proposed contribution has therefore two goals: Firstly, to replicate the findings about the harmful effect of female long-distance commuting on partnership stability; secondly, to investigate in more detail whether the commuting-effect might be spurious.

Data and methods

The data comes from the German Family Panel study pairfam, which offers rich possibilities for studying the dynamics of partnerships and marriages (Huinink et al. 2011). The analysis is based on the first three waves, release 4.0. The pairfam survey provides detailed information about the journey to work for the anchor person, which is asked every other wave starting with wave one. On grounds of previous research couples with female anchor persons were selected.

Dependent variable is partnership dissolution, based on the self-reported end of the partnership from the anchor person. Our sample comprises women of the two eldest cohorts who had a partner in the first wave, and who were followed up to the second or third wave. Those cohorts were between 25 and 28 and between 35 and 38 years old at the point in time of the first interview, what are reasonable age spans for the goal of analysis. After data clearing, the sub-sample includes about 2,500 women in partnerships, and 312 separations are observed. A longitudinal dataset on the basis of person-months is constructed which spans up to 30 months (N~50,600 observations).

For the analysis of the impact of female long-distance commuting on partnership stability over time event-history methods are suitable. Binomial logistic regression is used to perform a discrete time event history analysis (Allison 1982). To avoid left-censoring at the time of the first interview, the previous duration of the partnership is considered in the estimation

(Guo 1993). The dependent and independent variables are chosen and formed in a way similar to the article which is intended to replicate (that is Kley 2012). Dependent variable is the self-reported end of the partnership from the anchor person. The most important independent variable, long-distance commuting, is defined as a commute of at least one hour per way between home and workplace. Other variables considered in the analysis refer to the degree of participation in the labour-market of both woman and man, the age at the beginning of the partnership, educational homogamy, married or unmarried cohabitation, the age of the youngest child living in the household, and area characteristics of the place of residence. The predictors were formed time-variable, aside from the following exceptions which were constants measured in the first wave: age at the beginning of the partnership, educational level, place of residence (after moving beyond the city boundaries the history is treated as censored).

Whether the harmful effect of female commuting on the stability of partnerships might be spurious is analysed for a subsample – for which a strong harmful effect is found – making use of propensity score matching and estimating the average treatment effect on the treated (ATT) using stratification matching (Rosenbaum & Rubin 1983). This analysis is based on the same but partly simplified variables like the previous analyses, to ensure stability of the estimates despite of a small sample size. With propensity score matching the other predictors are adjusted to form similar groups within the subgroup of female commuters in the first wave or – in case long-distance commuting was started later – in the first month with a lengthy commute (N=1166 persons). Blocks are detected in which the mean propensity score for treated and not treated persons (commuters and non-commuters) is not different, and which are balanced according to the distribution of covariates. Finally, the ATT analysis is performed and sensitivity analyses are carried out.

Results

1. Harmful effects of female commuting on partnership stability?

A stepwise modelling strategy reveals in step one without any other covariates a 47-percent increase in the odds of separation for female long-distance commuters, which is significant at the 10-percent level. According to the full model, the odds of separation are nearly four times higher (odds ratio = 4.01 x 0.94 = 3.77) due to female long-distance commuting if the couple lives in a big city (100,000 inhabitants and more), and the odds are also considerably increased if the couple lives in a rural area (settlements and towns up to 50,000 inhabitants). For all other areas of living, e.g. medium sized cities, city suburbs and urbanized areas, no harmful effect of female long-distance commuting is estimated. These findings are in line with the findings of Kley (2012) who used a sample from two cities with approximately 200,000 inhabitants.

The effects of other covariates are as expected. The risk of separation is significantly reduced by higher previous durations of the partnership, higher age at the beginning of the partnership, full-time employment of the partner, married or unmarried cohabitation, and young children in the household. Compared to both partners having a tertiary educational level, the risk of separation is increased by any other constellation, but only partly to a statistical significant extent. The overall fit of the model is acceptable (McFadden's R-squared = 10.5).

2. Spuriousness of the commuting effect?

As a harmful effect of female commuting was exclusively found for inhabitants of big cities and rural areas, a sub-sample of the respondents living in those areas is constructed including approximately half of the respondents (N=1166). First, a propensity score is estimated on the basis of information from the first spell or – in case commuting was started later – the first spell with a lengthy commute. The idea behind this procedure is to detect groups of persons with similar distributions of covariates at the point in time commuting was observed first.[1] The propensity score is estimated via probit regression of covariates on the treatment variable; that is long-distance commuting of women. Similar covariates are used as for the analyses of influences on the risk of separation, but interaction terms are leaved out and some variables were simplified in order to satisfy the balancing property.

Standardized differences of the mean values and proportions in case of dichotomous variables reveal significant imbalance in five out of nine variables before matching was carried out: The proportions of women working full-time, having a second residence, having a tertiary level of education and living with an equally high educated partner, being childless and living in Eastern Germany were significantly higher among the female long-distance commuters compared to other women. After matching the standardized differences are considerably reduced and no significant imbalance exists any longer. The applied stratification procedure results five blocks with N=1089 persons; 76 women (7%) are long-distance commuters. In each block the assignment to treatment (commuting) can be considered random.[2]

The analysis of the average treatment effect on the treated (ATT) is performed using stratification matching, the same procedure used for estimating the propensity score. The ATT is estimated to be 0.121 with an analytical standard error of 0.053. The statistic t = 2.297 suggests that for the subgroup of couples living in big cities and in rural areas, female commuting indeed increases the risk of separation significantly.

Finally, sensitivity analyses are carried out. The calculation of Mantel-Haenszel bounds suggest that the harmful effect of female-long-distance commuting on partnership stability is substantial even if an unobserved variable caused the odds ratio of treatment assignment to differ between the treatment and comparison groups by 1.55 (less than 10-percent probability of error).

Conclusion

This study replicates findings about harmful effects of female long-distance commuting for partnership stability on the basis of a nation-wide dataset for big cities and rural areas in Germany. Despite of the application of methods for longitudinal analysis these findings still might not be reliable because only a small proportion of women are long-distance commuters, and because the observation window in both studies was rather small. Women who take the burden of long-distance commuting are a special group: compared to other women they work more often full-time, have more often a second residence, are more often

[1] An alternative estimation of the propensity score in the first spell for all individuals, regardless of whether they started commuting later or not, resulted in a slightly reduced but still significant average treatment effect on the treated.

[2] The fifth block is not part of the ATT-analysis because it consists of only four female commuters for whom no similar women without lengthy commutes were found.

highly educated, and are more often childless. As these characteristics were found to enhance the risk of separation, the harmful influence of commuting might be spurious.

Therefore, a stratified matching procedure was applied to estimate the average treatment effect on the treated after imbalance in the covariates was ruled out. This analysis suggests that a negative and significant effect of female long-distance commuting on partnership stability indeed exists in the sub-sample of couples who live in big cities or in rural areas. According to sensitivity analysis this effect is robust to some degree.

We therefore conclude that stressful daily practices like commuting might spread into other areas of life, like the partnership. Working women who have considerable commutes might face a "triple burden", because of household responsibilities, substantive labour force participation and time-consuming commutes. It might be that in big cities and in rural areas long-distance commutes are often started involuntary, due to the high demands on spatial flexibility in modern labour markets, whereas in urbanized regions and suburbs commuting is more often perceived as an unavoidable result of a carefully considered decision where to live. But as these questions are beyond the scope of this article we have to leave them to further research.

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