Intergenerational Transmission of Fertility Timing in Germany

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The transmission of behavior across generations has been of key interest to social scientists for a long time (Pearson et al., 1899). The objective of this study is to examine the transition to first birth by considering factors that display continuity across generations in Germany. The study aims to explain how the characteristics of the family of origin contribute to the fertility behavior of the next generation. Although intergenerational transmission of fertility behavior has been shown in several developed societies, most evidence comes from the US (Barber 2001; Högnäs and Carlson 2012). However, it cannot be assumed that the results for the US hold for other countries, especially considering the mechanisms of transmission. Since intergenerational social mobility and therefore the intergenerational continuities in education vary between different countries (Blanden et al., 2005, pp. 2), continuity of fertility behavior across generations could vary by countries as well. Since Germany is known for a very tight linkage between parents' and children's education and social status (Heineck and Riphahn, 2007), it can be expected that this might be an important mechanism underlying the transmission of fertility behavior.

Despite the relevance of this topic to gain a better understanding of fertility behavior, comparatively little research can be found for Germany. This is largely due to data limitations that do not allow studying the intergenerational transmission of fertility. Some analyses on the effect of family size on the transition to first birth were conducted for Germany (Kotte and Ludwig, 2011). However, it has so far not been possible to observe patterns of fertility timing. This study aims at closing that gap.

Another contribution of this study is the focus on the mechanisms driving the intergenerational transmission of fertility timing. Parents are known to influence their children in various ways. Socialization is one of the main mechanisms identified for intergenerational continuity, yet it is not clear to which extent similar behavior across generations might be based on their similar socioeconomic status (De Valk and Liefbroer, 2007, pp. 190). The analysis includes a variable for the age at leaving the parental home, which according to the theory of social control leads to earlier childbearing due to a lack of parental control (Wu and Martinson, 1993, pp. 212).

Furthermore, this study sheds light on differences in the intergenerational transmission of fertility timing in eastern and western Germany, as well as in two birth cohorts.

Theoretical focus

The mechanisms explaining intergenerational transmission are deeply complex. While several theories have been stated to illustrate the relationship between mothers' and daughters' fertility, most research considers mainly the socialization theory and the transmission of socioeconomic position. The socialization theory implies that fertility similarities across generations are a direct consequence of parents passing on their preferences and values to their young children. In the course of being a role model, parents determine their children's behavior by shaping their preferences (Kolk 2014; Wu and Martinson 1993; Barber 2000). A competing approach to the socialization theory is that resemblances across generations are due to similar socioeconomic positions and characteristics. This approach centers on the idea that mothers and daughters often share the same social position and that they therefore face similar opportunities (Barber 2001; Bengtson 1975). Social control theory, however, states that parents influence their children via social control techniques like punishment and reward. This implies that two-parent families are better capable to supervise and control children than single-parent families (Wu and Martinson, 1993, pp. 212). The extent to which parents can manipulate and control their children interacts with the timing of children leaving the parental household.

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Research question
The focus of this study is to show the link between mothers' and daughters' timing of fertility in Germany and how this continuity might be explained. The first matter of interest therefore is if information about mothers' fertility and characteristics help to understand daughters' fertility. The second research question aims at exploring the mechanisms of intergenerational continuity. The study is based on the following hypotheses:
Hypothesis one relates to the continuity across generations itself. According to that a significant effect of mothers' age at daughters' birth should be found. Furthermore, the direction should be similar: the older the mother at birth the older her daughter will be when having her first child.
The second hypothesis considers the driving mechanisms of intergenerational continuity. In this context, a significant effect of maternal education and a weakening of the association between mothers' and daughters' age at birth would be evidence for the socio-economic pathway. As opposed to this, a consistent effect of mothers' age at daughters' first birth after controlling for mothers' education would favor the socialization theory. Finally, a significant effect of daughters' age at moving out would support the social control theory. The direction of this relationship would state that the younger the daughter at moving out of the parental home the younger she will be at first birth.

Data and methods
The Panel Analysis of Intimate Relationships and Family Dynamics (pairfam) is used to answer the research questions. This data is particularly suited for the purpose of this study since it allows addressing intergenerational transmission of fertility via timing of birth in Germany and is not restricted to family size analyses. The sample of pairfam's anchor dataset used for this study is based on the waves 1 to 3 and its East German supplement DemoDiff wave 1 and 2, forming a master sample of 13,891 respondents. Selecting women and excluding the youngest cohort leads to a sample size of 4,974 women. Event history analysis (piecewise-constant models) is applied to determine the transition to first birth. Usually mothers' age at first birth is used to analyze the transmission of fertility timing. Due to data limitations, another approach is used in this study. Mothers' age at anchors' birth, meaning mothers' age at bearing the daughter in this sample, is included to understand the transmission. The parent sample of pairfam would allow an analysis of mothers' age at first birth, yet the sample size is still too small to be used. Our approach of using mothers' age at anchors' birth instead of first birth can be justified by the assumption that a mother's age at her own birth might affect a daughter more or to the same extent than a mother's age at first birth; especially if the birth interval is large. Further covariates included to determine the explanatory power of the family of origin compared to individual characteristics are anchor's education, mother's education, cohort, region, religiosity, number of siblings and the age at moving out of the parental home.

Results
Here an overview of the main results of this study will be given and a short conclusion will focus only on the main results as well. Table 1 shows the results of the piecewise-constant models for the population under study. The first model includes the individual characteristics of the daughter, while model 2 also contains information on the mother. Model 3 shows one of the interaction effects considered in this analysis. However, further analysis and models have been run. All those models were run stepwise as well to distinguish between the effects. Models by cohort were controlled for by running the analysis with and without adjusted observation periods to make sure that the results are robust. Furthermore, separate models for eastern and western Germany were analyzed. Finally several more models including interaction effects in terms of cohort and age were run.
An effect of mothers' age at anchors' birth can be seen, especially for early childbearing. The younger the mother at her daughter's birth the younger is the daughter at her first birth. These results are consistent even when other covariates are included. Moreover,

Table 1: Results of the piecewise-constant models regarding the transition to first birth

	Model 1		Model 2		Model 3	
Age						
15-20	0.16	***	0.15	***		
20-25	0.53	***	0.51	***		
25-40	1		1			
Cohort						
1981-83	0.90	**	0.93		0.93	
1971-73	1		1		1	
Region						
West	1		1		1	
East	1.27	***	1.12	*	0.11	*
Education						
Lower education	1		1		1	
Intermediate education	0.77	***	0.78	***	0.78	***
Upper education	0.45	***	0.47	***	0.48	***
Missing	0.52		0.56		0.55	
Religion						
Christian	1		1		1	
Other Religion	1.68	***	1.45	***	1.43	***
No religion	1.01		0.96		0.96	
Missing	0.94		0.88		0.89	
Number of Siblings						
No Siblings			1		1	
1 Sibling			1.06		1.05	
2 Siblings			1.15	*	1.15	*
3 and more Siblings			1.45	***	1.44	***
Missing			1.30		1.31	
Mothers' Age at Daughters' Birth						
Under 20			1.35	***		
20-25			1.17	***		
25-30			1			
30-35			0.90			
35-50			0.97			
Missing			1.33	***		
Mothers' Education						
Lower education			1		1	
Intermediate education			1.14		1.15	
Upper education			0.97		0.96	
Missing			1.23	***	1.23	***
Age at Moving Out of Parental Home						
16-20			1		1	
21-25			0.80	***	0.80	***
26-37			0.47	***	0.47	***
Missing			0.59	***	0.60	***
Mothers' Age at Daughters' Birth * Age						
Mother under 20, daughter 15-20					0.34	***
Mother 20-25, daughter 15-20					0.27	***
Mother 25-30, daughter 15-20					0.24	***
Mother 30-35, daughter 15-20					0.16	***
Mother 35-50, daughter 15-20					0.21	***
Mothers' age missing, daughter 15-20					0.48	***
Mother under 20, daughter 20-25					1.34	**
Mother 20-25, daughter 20-25					1	
Mother 25-30, daughter 20-25					0.70	***
Mother 30-35, daughter 20-25					0.67	***
Mother 35-50, daughter 20-25					0.73	*
Mothers' age missing, daughter 20-25					1.08	
Mother under 20, daughter 25-40					1.79	***
Mother 20-25, daughter 25-40					1.81	***
Mother 25-30, daughter 25-40					1.73	***
Mother 30-35, daughter 25-40					1.56	***
Mother 35-50, daughter 25-40					1.63	***
Mother's age missing, daughter 25-40					1.75	***
LL	-4618.1		-4497.73		-4475.94	
D			240.76	***	43.58	***
N	4974		4974		4974	

*** p ≤ 0,001; ** p ≤ 0,01; * p ≤ 0,05

daughters' age at moving out is highly significant over all age groups. It indicates that the older the daughter when leaving the parental home the older she will be when having a first birth. Mothers' education does not seem to have an effect on daughters' timing of fertility. However, daughters' own education shows a strong negative correlation with her first birth. The interaction between mothers' age at daughters' birth and daughters' age implies a strong relationship. Compared to the reference category daughters generally face a lower first birth risk when they are very young and a higher first birth risk from age 25 onwards. A positive impact of mothers' young age at childbearing is limited to daughers between 20 and 25.

Conclusion
Intergenerational transmission of fertility behavior, and especially the timing of childbearing, has been rarely analyzed for Germany. The findings of this study are mainly in line with research on intergenerational transmission of fertility timing for other western countries. The results suggest a support of the socialization theory as well as the social control theory. However, no effect of mothers' education could be detected. Therefore, mothers' socioeconomic characteristics seem to explain little of the transition to first birth. This explanation needs to be further qualified because of a possibly high correlation between mothers' and daughters' education and a potential bias due to a high extent of missing cases for mothers' education.
In summary, better longitudinal surveys capturing information about different generations are still needed for Germany, especially in order to link the socioeconomic information about the mother to the time she gave birth. Furthermore, including men, as well as other covariates, could improve the insight into intergenerational transmission processes.

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