

The Effects of Birth Order on Educational Transitions in West Germany

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Abstract

This study analyzes the effect of birth order on educational transitions. After decades of varied degrees of enthusiasm and skepticism, recent research has increasingly reported effects of birth order on a host of psychological and socioeconomic outcomes. The objective of this study is to contribute to understanding when in the educational career birth order effects are most relevant by analyzing these effects on educational transitions made at different points of the schooling career, with particular interest on whether the effects vary in strength at different educational transition points. We analyze life history data that includes information on educational attainment of all siblings in West Germany, a country where pupils are tracked into different educational careers early in life. Preliminary findings stress the importance of birth order on educational attainment also in the West German context.

Background

This study analyzes the effects of birth order on educational transitions over the schooling career in West Germany. The effects of birth order on various psychological and socioeconomic outcomes have been long contested (e.g., Zajonc and Markus 1975; Hauser and Sewell 1985; Rodgers et al. 2000; Retherford and Sewell 1991). During the past two decades, the commonly accepted conclusion among many researchers has been that birth order does not matter, and the apparent relationships between birth order and a host of outcomes can be explained by the confounding role of sibship size (Steelman *et al.* 2002). However, recent results which are based on comparisons of siblings from the same family have found renewed evidence of negative birth order effects on the IQ (Kristensen and Bjerkedal 2007) and educational attainment and labor market outcomes (e.g., Black, Deveraux and Salvanes 2005).

Objective and motivation of the study

The objective of this study is extend this renewed literature on birth order effects by focusing the effects of birth order on educational transitions across the schooling career. The overall objective is thus to better understand whether birth order effects vary in strength at different stages of the educational career, and if so, when. As shown below (Table 1), birth order effects on educational attainment can be found also in West Germany.

The motivation to study birth order effects on educational attainment as a result of educational transitions made at different points in educational career is twofold.

Firstly, social stratification researchers have for long analyzed the effects of family background on educational attainment as a function of the family background effects on different

transitions, with a specific interest in the question whether family background effects are weaker at later transitions (e.g., Mare 1993).

In these studies, family background effects refer generally to effects that arise from the fact that some children are born into and a brought up in different families. However, much of inequalities in socioeconomic attainment can be assigned to differences between siblings from the same family. Birth order is among the factors that can affect these differences. In general, it is not clear and thus an empirical question how family decisions of school continuation of different siblings might vary across different transition points, given possible family strategies that can either reduce or widen inequalities between siblings (cf. Conley 2008). If families behave in ways that tend to reduce attainment differences between siblings and if birth order is related to factors that independently affect school continuation decisions, one would expect birth order effects to increase at later transitions when the relative influence of the family of origin is weaker. The opposite could be the case if families generally “bet on the strongest horse” in deciding whose chances to promote.

Secondly, and more specifically (and also related to the latter point), according to the confluence theory (e.g. Zajonc 2001; Zajonc and Markus 1975), we might expect birth order effects to appear at later rather than earlier educational transitions. According to this theory, the cognitive advantage of earlier-born children starts appearing around the age of 11 (Zajonc 2001). To the extent that schooling continuation decisions reflect such cognitive differences between siblings, one would expect birth order effects to widen at later transitions.

Based on these speculations, one might expect to find either widening or decreasing effects of birth order across successive educational transitions. This is generally not the hypothesis made of the effects of family background on schooling continuation decisions, which generally expects weakening effects of family background.

The West German context

The German educational system is a prime example of a tracked educational system, where children can, in addition to discontinuing education, choose between different educational tracks. These decisions generally have far-reaching consequences as choices made at early stages of the schooling career determine the opportunities for later education. The first transition decision occurs already around the age of 10, when families decide (on the recommendation by schools) whether to send their children to an academically oriented or a more vocationally oriented educational track. Decisions made at different points of the schooling career are practically irreversible.

These features of the German system make it a particularly relevant setting in which to analyze whether birth order effects vary in strength at different educational transition points.

Data and methods

We use the West German sample of the German Life History Study, a retrospective study of different German cohorts born between 1919 and 1971. A main advantage of these data for our

purposes is in the fact that they contain information on the birth years and educational attainments of all siblings of the respondent. We use this information to construct the birth order variable and the educational attainment of the siblings. Since the data contain information only on the final educational attainment levels of the siblings, we constructed “ideal” educational trajectories needed to reach this attainment level.

We analyze these data using multilevel multiprocess simultaneous equations modeling, in which all the educational transitions are modeled simultaneously, allowing for the correlation between the error terms of the of separate equations. Given that pupils can chose between various tracks, multinomial transition models are appropriate (Breen and Jonsson 2000). The models are estimated using aML software.

These models also allow for correlated error terms between the siblings. We will examine the usefulness of including sibling fixed-effects, which control for unobserved heterogeneity at the family level, but reduce efficiency in estimation. The added value of these models compared to models with models with a purposefully selected set of control variables is assessed with Hausman tests.

Preliminary results

Thus far, we have estimated descriptive regressions of birth order effects on final educational attainment levels. Table 1 shows estimates of two specifications of birth order on years of education completed in West Germany from sibling fixed effects regression models. These figures show clear negative effects of birth order on educational attainment.¹

Table 1 Sibling fixed effects estimates of birth order on years of attained education

Birth order (linear)	-0.18***	
	(0.03)	
2 nd child (1 st reference)	-0.39***	
	(0.05)	
3 rd child	-0.65***	
	(0.07)	
4 th child	-0.86***	
	(0.10)	
5 th child	-0.92***	
	(0.13)	
6th child or later	-1.10***	
	(0.15)	
N siblings	21,129	21,129
N families	8,332	8,332

Controls: Female, year of birth/mother’s age at birth, number of siblings born within 2 years.

¹ It is also worthwhile noting that in (between-family) OLS specifications of the effects of birth order on years of attained education without family fixed effects, there is no birth order effect visible when controlling for sibship size but not for mother’s age at birth. The birth order effect becomes apparent when controlling for the mother’s age at birth. This shows that the positive effect of the mother’s age at birth can suppress the birth order effect.

Additional preliminary findings show that these differences are not stable. Birth order effects are stronger in families where parents have higher levels of education. These can be interpreted as evidence for family strategies that widen differences between siblings' human capital attainment. Furthermore, they appear stronger in later cohorts, and the interaction effect between parental education and birth order only appears in the later cohorts.

The objective of the future analyses is to examine whether the strength of birth order effects varies by educational transition. We will also attempt to further analyze the socioeconomic and cohort differences in birth order effects.

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