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MEASURING THE EFFECTS of SOCIOECONOMIC SEGREGATION on THE FIRST REQUIRED SCHOOL TRACK DECISION in GERMANY. A SMALL-SCALE, EGO-CENTERED AND MULTISCALAR APPROACH.

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Space and place are aspects of the production and reproduction of social inequality in population will constitute the central theme of this study. Space and place are two ubiquitous but mainly disregarded subjects in sociology (Läpple, 1992). Everything happens somewhere, and the specific socio-spatial context affects behavior, attitudes, provides opportunities and restrictions. Consequently, space must be thought of as something that is constructed by action and also affects action (Löw, 2012; Werlen, 2008). Research suggests the particular importance of the socio-spatial context for children (Glauser & Becker, 2016; Griffith & Rothstein, 2009) through various mechanism's (Galster, 2012). Due to their lack of autonomous mobility, children spend a vast amount of their time in the vicinity of their parental home, socializing with friends, participating in local activities, and often attending local schools and daycare centers. As a consequence, the majority of children's social interaction take place in the vicinity of their parental home. Therefore, their norms and standards, behavior, attitudes and aspirations and the habitus are decisively shaped by the socio-spatial context through social interactions (Bronfenbrenner, Lüscher, & Cranach, 1989; Brooks Gunn, Duncan, & Aber, 1997).

In the context of the highly stratified German school system (Neugebauer, Reimer, Schindler, & Stocké, 2013) with its early first transition point and the rare instances of track mobility (Berkemeyer & Kanders, 2013; Mühlenweg, 2008; Schneider, 2008), socially segregated contexts can be expected to be important for children's educational attainment. This study expands on 'classical' empirical studies on educational attainment and school track decisions based on social origin (i.a. Boudon, 1974; Mare, 1980), by also taking potential effects of the socio-spatial context into account. Thus the persistent results, that children from more advantaged social backgrounds tend on average to take up more ambitious educational options than do children from less advantaged backgrounds, even when level of previous academic performance is held constant (i.a.Goldthorpe, 2007vol. II: ch. 2) is analysed while specifically taking the ego-centered socio-spatial context into account.

Based on data of the German Socio-Economic Panel (SOEP) from 2010-2017 (SOEP v34, 2019), the effects of living in a segregated socio-spatial context on the required school track decision in Germany are analysed, making use of small-scale georeferenced consumer marketing data (Goebel, Spieß, Witte, & Gerstenberg, 2014; microm Consumer Marketing, 2015). Small-scale spatial data is generated by spatially overlaying different spatial layers within a 100x100 meter raster from the population census 2011 (Zensus 2011b), enabling us to use innovative ego-centered segregation measures.

The different spatial layers, which contain information on the number of households, as well as the share of households in the top and bottom decile of the micorm status distribution are spatially superimposed and downscaled to a 100x100 meter grid. This 100x100 meter grid data then provides detailed socioeconomic information throughout Germany on a small spatial scale. Due to the fact, that all data is geocoded, the SOEP households can be spatially positioned within the small-scale socioeconomic information. This sophisticated data preparation allows the construction of bespoke, ego-centered (e.g. Hipp & Boessen, 2013) socio-spatial contexts for each household and the use of multiscalar segregation measures (Hennerdal & Nielsen, 2017) as an approximation of some characteristics of the assumed socio-spatial environment.

The problems, which arise in similar studies considering the socio-spatial context, which are based on administrative districts as the operationalization of the socio-spatial context can be surmounted. Using a multiscalar segregation measure (Hennerdal & Nielsen, 2017), the „modifiable areal unit problem" (MAUP) (Demetry, 2017; Östh, Malmberg, & Andersson, 2014) becomes meaningful information (Openshaw, 1984). Also the problem of the inaccurate definition of the socio-spatial context (action-space) (Friedrichs, 1983) and thus the overestimation and underestimation of distances (Dubin, 1992; Logan, 2012), which are used as a proxy for

the probability of social interaction (Hipp & Perrin, 2009), can be overcome due to the use of small scale data and ego-centered methods.

A disproportional distribution of low or high-status households (based on the microm status classification) – which qualifies as segregation (Friedrichs, 2000; Häußermann, 2008)– is assumed to also lead to an uneven distribution of economic and cultural goods (Hauf, 2006). The disproportional distribution of material and cultural goods is assumed to have an effect, through various mechanisms (Galster, 2012), on the school performance on the general outlook on formal education and thus on the probability to choose a more prestigious school track.

First results from a logistic regression model on realized school track decision at the end of primary school (dependent variable high school (yes=1; no=0)) indicate small and significant effects depending on the magnitude of the socio-economic segregation.

Logistic regression on realised school track decision after completing primary school in Germany

	Modell 1	Average marginal effect	Modell 2	Average marginal effect
Highest Casmin-Classification of parents (Dominanzmodell)				
(1a) Inadequately Complete (reference)				
(1b) general elementary school	1.28	0.12	1.32	0.13
(1c) basic vocational qualification	0.30	0.03	0.48	0.04
(2b) intermediate general qualification	1.62	0.16	1.73	0.17
(2a) intermediate vocational	2.05 ***	0.21 ***	2.14 **	0.22 ***
(2c_gen) general maturity certificate	2.77 ***	0.29 ***	2.85 ***	0.30 ***
(2c_voc) vocational maturity certificate	2.35 **	0.24 ***	2.45 **	0.25 ***
(3a) lower tertiary education	2.82 ***	0.30 ***	2.94 ***	0.31 ***
(3b) higher tertiary education	3.63 ***	0.39 ***	3.73 ***	0.40 ***
School marks (1 (best) - 6 (poor))				
Math grades	-1.67 ***	-0.17 ***	-1.63 ***	-0.16 ***
First language grades	-1.39 ***	-0.14 ***	-1.39 ***	-0.14 ***
Immigrant background				
No direct or indirect immigrant background (reference)				
direct immigrant background	1.67 *	0.16 **	1.73 **	0.17 **
indirect immigrant background	0.17	0.02	0.17	0.02
Household-level Indicators				
Household equivalent income	0.77 ***	0.08 ***	0.72 ***	0.07 ***
Proportion of life spend in current habitat	0.61 **	0.06 **	0.57 **	0.06 **
Spatial indicator (as approximation of rural and urban areas)				
Population density (Radius to realise 3200 neighbouring households)	-0.0002 **	0.0000 **	-0.0002 **	0.000 **
Mono- and Multiscalar segregation measures				
Monoscalar segregation meseaure for k=12800 & K=50000 (high-status)	-0.60 ***	-0.06 ***		
Multiscalar segregation measure for high-status households			0.82 **	0.08 **
_cons	-2.19		-2.70	
N	**1359**	**1359**	**1359**	**1359**
Pseudo R2	**0.54**		**0.54**	

p<*0.10 /p<**0.05 / p<***0.01

Also controlled for but not displayed: gender / reported health (child) / householdtype / frequency of meeting with friends (child) / federal state / year of observation / Big V - Openesse (child) / age of schoolenrollment

Living in a highly segregated socio-spatial context, which consist of disproportionately many high-status households (unit of analysis k=12800 / unit of reference K=50000) increases the log odds significantly in favor of

a decision towards the high school track. Looking at the average marginal effects, the probability to choose the high school track increases by six percentage points. The variable contains the probability of the cumulative hypergeometric distribution of households within the unit of analysis with reference to the unit of reference - low values indicate high segregation, high values indicate low segregation.

The multiscalar measure (this time the orientation of the variable is more intuitive) yields a similar picture, increasing the probability to choose the high school track by eight percentage points. As shown by Karlson and Holm (2011) the KHB-decomposition method can be used as an analytical framework based on Boudons theory of primary and secondary effects (Boudon, 1974; Karlson & Holm, 2011). This framework will be used and expanded by the socio-spatial context.

By using the KHB-decomposition method (Kohler, Karlson, & Holm, 2011), it is possible to determine the unique effect (either regarding the socio-spatial context as mediator of the educational level of the family of origin or as further key variable (Karlson & Holm, 2011; Kohler, Karlson, & Holm, 2011)) of the socio-spatial context and its share of the total effect, while controlling for the socioeconomic indicators of the family of origin.

The data operationalization process, the multiscalar method and the application to the analysis of potential effects of the socio-spatial context on the required school track decision in Germany will be presented.

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