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How do students with special educational needs participate in classrooms with ethnic heterogeneity?

Theoretical Background

Research on effects of classroom composition

- focuses mostly on effects of the average ability-related and socioeconomic classroom composition on achievement differences (van Ewijk & Sleegers, 2010)
- less examined: social outcomes like social participation and effects of ethnic heterogeneity in classrooms

Social participation of students with special educational needs (SEN) in inclusive classroom settings

- Positive interaction with peers: important aspect of social participation (Koster et al., 2009)
- SEN students: particularly vulnerable group in inclusive classroom settings, overall lower social participation (Bossaert et al., 2019)

Theoretical approaches to effects of ethnical heterogeneity on social participation

- Considering homophily (McPherson et al., 2001), students have rather few opportunities to select interaction partners with the same ethnic background in very heterogeneous classrooms
  → lower social participation?
- Conversely, a high ethnic diversity could lead to overcoming ethnic homophile tendencies because of the absence of possible interaction partners with the same ethnical background (Dollase et al., 2002)
  → higher social participation?

- Age effects: ethnic background more important for older than for younger students (Dollase, 1994)

Research Questions

1. Does ethnic heterogeneity of classrooms predict social participation over and above student-level characteristics?
2. Are there differential effects of ethnic heterogeneity in primary and secondary school?
3. Do ethnically more heterogeneous classroom settings improve social participation of SEN students?

KOMPOSIT
Klassenkomposition und soziale Integration in inklusiven Schulklassen

STARKE KLASSE

Measures

Please mark how often you spend your time with your classmates during the breaks!

Name	always	often	sometimes	rarely	never
Anna	☐	☐	☐	☐	☐
Cem	☐	☐	☐	☐	☐
…	☐	☐	☐	☐	☐

- **Social interaction:** Sociometric rating list
  → mean percentage of received ratings

- **SEN**: diagnosed SEN (information provided by teacher)
- **Ethnic background**: language spoken at home (family language)
- **Cognitive ability**: non-verbal test with figural analogies: KFT 4–12+R (Heller & Perleth, 2000)

Ethnic heterogeneity
Categorization of language spoken at home in language families

Simpson Diversity Index (Simpson, 1949)
probability that two pupils taken at random from a class are from different language families

$$SI = 1 - \sum_{i=1}^{k} \frac{n_i(n_i - 1)}{n(n-1)}$$

- **Social Interaction**: nomination list (students marked peers they play most with)
  → standardized indegree

With whom do you play the most?
Please mark the names!

01	Mohamed
02	Julie
03	…

- **SEN**: diagnosed SEN and teachers' suspicion
- **Ethnic background**: language spoken at home (family language)
- **Achievement level**: standardized mathematic test: DEMAT 1+/2+ (Krajewski et al, 2004)

Samples

Secondary Comprehensive Schools

Schools	20		
Classes	52		
Students (participation rate)	821		(73.8%)
	Students	Classes	% of sample
Grade 5	262	16	31.9%
Grade 6	288	19	35.1%
Grade 7	271	17	33.0%
Students with SEN	111		13.5%
Sex: male / female / missing	439 / 372 / 10		53.5% / 45.3% / 1.2%
Language spoken at home: German	556		67.7%

Primary Schools

Schools	11	
Classes	44	
Students (participation rate)	950	(90.7%)
	Students	% of sample
Grade 2	450	47.4%
Grade 3	500	52.6%
Students with SEN	45	4.7%
Sex: male / female / missing	450 / 497 / 3	47.4% / 52.3% / 0.3%
Language spoken at home: German	630	66.3%

Analyses

Multilevel Regression Modelling: Prediction of social interaction during school breaks

	Model 1		Model 2		Model 3	
Intercept	37.59 ***	(1.43)	31.85 ***	(2.87)	31.61 ***	(2.89)
Individual Level						
Sex *(0=female)*	-0.24	(1.89)	-0.26	(1.89)	-0.25	(1.89)
SEN *(0=no)*	-4.89 ***	(1.23)	-4.91 ***	(1.22)	-2.78	(3.45)
Cognitive ability *(z-score)*	0.31	(0.42)	0.32	(0.42)	0.32	(0.42)
Migration background *(0=no)*	-0.48	(0.91)	-0.70	(0.91)	-0.71	(0.91)
Class Level						
Simpson Index			13.51 *	(5.95)	14.08 *	
SEN x Simpson Index					-4.91	
AIC	5795.06		5787.08[a*]		5782.80	
R^2 Level 1	.255		.255		.255	
R^2 Level 2	.020		.173		.176	

$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$, [a*]improvement of model fit compared to model 1 ($p<.05$)

Multilevel Regression Modelling: Prediction of social interaction for playing

	Model 1		Model 2		Model 3	
Intercept	23.40 ***	(1.02)	20.27 ***	(2.05)	20.24 ***	(2.06)
Individual Level						
Sex *(0=female)*	-0.42	(0.74)	-0.43	(0.74)	-0.43	(0.74)
SEN *(0=no)*	-7.39 ***	(1.77)	-7.33 ***	(1.77)	-6.28	(4.59)
Achievement level *(z-score)*	2.62 ***	(0.42)	2.65 ***	(0.42)	2.64 ***	(0.42)
Migration background *(0=no)*	-4.20 ***	(0.85)	-4.47 ***	(0.87)	-4.48 ***	(0.87)
Class Level						
Simpson Index			6.84 †	(3.92)	6.92 †	(3.93)
SEN x Simpson Index					-2.24	(9.02)
AIC	7071.34		7065.77		7061.47	
R^2 Level 1	.099		.099		.098	
R^2 Level 2	.000		.049		.051	

$^{***}p < .001$, $^{**}p < .01$, $^{*}p < .05$, $^{\dagger}p < .10$

Discussion

- Simpson index as a measure of ethnic heterogeneity shows significant effects on social participation in secondary school classes and, at least in trend, effects in primary school classes (p=.08).
- Using a more detailed variable for heterogeneity that considers variety and evenness of heterogeneity as a joint index could give a better explanation of social processes in classrooms.
- The higher effect for older compared to younger students confirms previous findings.
- In both studies, SEN students are at risk regarding a lower social participation.
- Controlling for student- and classroom-level characteristics, there are no interaction effects for SEN students regarding ethnic heterogeneity in class
  → no increased risk, but also no advantages for SEN students in inclusive classrooms

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DFG Deutsche Forschungsgemeinschaft