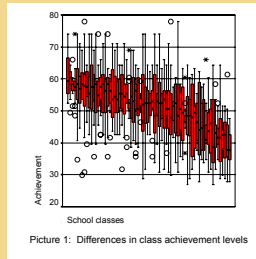


## Introduction

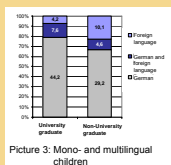
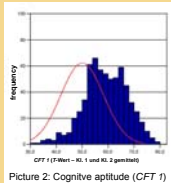
School classes differ significantly in their achievement level (see picture 1). These differences between school classes are already evident in first grade and are not due to class size nor percentage of children with poor German language proficiency (Treutlein, Roos & Schöler, in prep.). The catchment area of a school can also not be seen as the reason for these differences, because even classes of the same year and school differ in their achievement level (Scheib, Schöler, Fehrenbach, Roos & Zöller, 2005). We can thus assume, that the different class achievement levels are mainly due to method of instruction. It is unclear, how these early class achievement differences influence the development of a student's scholastic achievement.



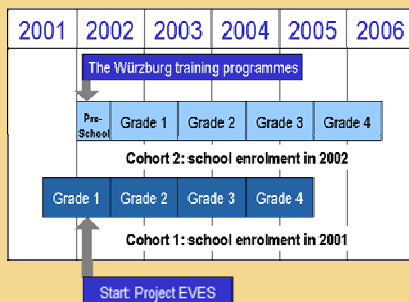
## Method

### Sample

The sample consists of 1,520 children (739 girls: 48.6%; 781 boys: 51.4%) of 16 elementary schools in Heidelberg, who entered school in the years 2001 and 2002, respectively. Mean age on school enrolment was 6;6 years (range: 5;0 to 9;1 years). The mental abilities were augmented with a mean *T*-score of 57.3 (*SD* = 8.6, see picture 2). This high result is in part due to the characteristics of the sample: Heidelberg is a university town and for that reason 55.9% of the children have academic parents. Most children (72.2%) grow up monolingual with German as native language. 12.3% grow up with more than one language, but with one parent speaking German as native language. In 15.5% of the families, parents describe their German language skills as poor. (see picture 3).



### Design



All children were observed for four years during primary school. At the end of each school year they completed several tests in reading and spelling.

### Dependent Variable and Predictors

<b>Used instrument</b>	WLLP – Würzburger LeiseLeseProbe (Würzburg Silent Reading Task; Küspert & Schneider, 1998), to measure reading rate in grade one to four. Raw data were used for analysing the increase of achievement. In fourth grade, ceiling effects were found. Therefore, only data obtained in grades one to three were analyzed.
<b>Dependent Variable</b>	Increase of achievement from second to third grade: calculated as difference between the raw score in grade two and three
<b>Predictors</b>	individual achievement and class achievement level } in first grade

## Analysis

Missing data was estimated via multiple imputations using NORM (Schafer, 2000). Multilevel analyses (HLM 6.04, Raudenbush, Bryk & Congdon, 2008) were performed to account for the hierarchical structure of the data.

To estimate the increase in proficiency, three models were conducted. In the first model, the increase in achievement was predicted by individual achievement level in first grade. In the second model, class achievement level in first grade was taken as a predictor, and in the third model both predictors were used.

$$\text{Model 1: } y = Y_{00} + Y_{01} * \text{indiv. achievement} + u_0 + r$$

$$\text{Model 2: } y = Y_{00} + Y_{10} * \text{class achievement} + u_0 + r$$

$$\text{Model 3: } y = Y_{00} + Y_{01} * \text{indiv. achievement} + Y_{10} * \text{class achievement} + u_0 + r$$

## Results

The results of model 1 and model 2 showed that using them as single predictors neither first grade individual achievement level nor class achievement level can explain a significant variance of the increase in achievement between second and third grade. When using both predictors (see model 3), however, the predictors show significant impact on the increase in achievement. The influence of individual achievement level on the increase in achievement between second and third grade is insignificant and negative: children, who perform poorly in first grade, show more progress between second and third grade than children, who already show profound reading skills in first grade. This means that on the individual level no Matthew-effect can be found. In contrast, a stronger and positive influence can be observed for class achievement level: children in classes with a high achievement level improve their reading rate more than children in classes with a low achievement level. Here we can observe a Matthew-effect.

	Model 1		Model 2		Model 3	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
Individual achievement	-.08	.05			-.09	.03
Class achievement			.19	.08	.28	.02

## Conclusion

The results show that class achievement level in first grade has a greater influence on the development of achievement than previous knowledge of the individual student. What is more, the previous knowledge of the group plays an important role for the development of a student's scholastic performance. In other words, we observe a Matthew-effect on class level, but not on individual level. Classes demonstrating good performance at the end of first grade show a greater increase in proficiency between second and third grade than classes performing poorly. Since the differences in class achievement level are not due to features of class composition (see introduction), the present results show the importance of a qualified instruction. Children in classes that receive a stimulating and conducive instruction from first grade on benefit in their further development from this superior starting position. It is important to note that in general, German children get a different teacher after second grade. Consequently, an increase in achievement is not due to continuous good or poor quality of instruction, which would increase advantages or deficits. Rather, we have to assume that the good quality of instruction in first grade fosters the further development of achievement and that well performing classmates have positive effects on individual achievement.

## References / More Information

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More information on the project and work reports for download can be found on <http://www.ph-heidelberg.de/wp/schoeler/seiten/EVES.htm>