School Effects in Growth Curve Models

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Extended abstract
1. Objective
The objective of this study is to give an overview of the literature on the size of school effects in growth curve models. These studies have led to contradictory results. Some studies found that school effects on student growth are larger than school effects on student status, while others have found exactly the opposite. The current study will employ a structured literature review to investigate whether certain study characteristics can explain these different results.

2. Theoretical background
This study examines the widely held belief that schools have a larger impact on their students' growth than on their students' outcomes at a certain point in time. This conviction stems mainly from the research of Raudenbush (1989, 1995) in which the school effect on student initial status for math was 14% whereas the school effect for math learning rates was over 80%.
Several studies confirm that the school effect is larger when student growth is the criterion (May, Supo¬vitz, & Perda, 2004; Raudenbush & Bryk, 2002; Van de gaer et al., 2009; Zvoch & Stevens, 2003), although the results are less spectacular than those of Raudenbush. Other studies found precisely the opposite (Reardon, 2003; Van der Werf et al., 2008). And some studies investigated several student out¬comes, leading to mixed results (De Fraine et al., 2007; Wilkins & Ma, 2002; 2003).

3. Research Questions
This paper will summarize the research on school effects for student status and growth. We are mainly interested in explaining the conflicting results in the literature.
The main research question is: What factors (study characteristics) might influence the size of school effects for student status and student growth? Four study characteristics will be studied:
1. the type of outcome (cognitive outcomes versus non-cognitive outcomes)
2 the level of education (primary versus secondary education)
3. the time coding (the meaning of the intercept)
4. the correction for student characteristics (such as gender and socio-economic status)

4. Method
Despite the popularity of growth curve models, the number of studies adding a school level to these models remains rather limited. Therefore, a meta-analysis was not possible. We thus employed a structured literature review. Fifteen studies met the inclusion criterion (employing a growth curve

model and including a school level).
In this study, "student growth" refers to the growth parameter(s) and "student status" refers to the intercept in the growth curve model (Singer & Willett, 2003). The school effect is measured as the percentage of the total variance in the criterion (status or growth) that is situated at the school level. The study characteristics were systematically derived from every paper (type of outcome, level of education, time coding and covariates).

5. Results
School effects are generally larger for cognitive outcomes than for non-cognitive outcomes, but the type of outcome does not systematically affects the size of school effects for status versus growth. The level of education also does not provide an explanation for the conflicting findings in the literature. It was found that the time coding affects the estimation of school effects. But in most studies, the intercept refers to the first measurement occassion. Thus, also the time coding could not provide an explanation.
Correcting for student intake variables strongly reduces the size of the school effects (from raw to net effects), and this correction has a stronger impact on the school effect for student status than on the school effect for student growth. However, the inclusion of these covariates could only partially explain the varying results.

6. Educational or scientific importance of the study
The analysis of longitudinal data through growth curve models has become more and more important in educational effectiveness research, because it addresses the effects of schools and teachers on the growth of students over time.
This study will present an overview of the literature and it will inspire researchers to collect and analyse data in order to gain more insight in how schools can affect their students growth in several outcomes.

7. Reference List
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