Merton scores twice: Teacher expectations as a self-fulfilling prophecy and a Matthew effect in relation to school composition.

"For to the one who has it, it shall be given, and it will be increased to him. But whoever does not have it, that which he has will be taken from him." (Matthew 25:29)

Extended summary

Objectives

Previous studies demonstrate that schools' socioeconomic status composition (hereafter: school SES) is related to pupils' academic achievement. That is, pupils who attend high SES schools are found to perform better than similar pupils who attend low SES schools. There is less consensus with respect to the impact of schools' ethnic, national origin or linguistic composition: reviews and meta-analyses show that the ethnic aspect of school composition is not (or only marginally) related to academic performance of individual pupils (Van Ewijk & Sleegers, 2010). While most of these previous studies focused on the direct effect of school compositional features – that is the model of [school SES --> achievement] – some scholars also examine how the composition effects can be explained/mediated by process variables (see Agirdag, Van Houtte & Van Avermaet, 2012; Agirdag, Van Avermaet & Van Houtte, 2013; Rjosk et al, 2014; Rumberger & Palardy, 2005). These studies generally revealed that instructional quality and teacher expectations mediate (or explain) why school SES is related to academic performance. This study builds further on this research about teacher expectation effects in relation to school composition effects, while it contributes with three novel aspects.

First, an important topic with respect to teacher expectancy effects is the 'accuracy' issue. That is, if teacher expectations are just accurate teacher perceptions about the abilities of their pupils, then we cannot speak about self-fulfilling prophecies as Merton (1948) defines them as 'a *false* definition of the situation evoking a new behavior which makes the original false conception come true' (p.195). Therefore, an objective indication of the real abilities of pupils needs to be included in the models before examining teacher expectation effects. As such, this study aims to replicate the model of [school SES --> teacher expectations --> achievement] while controlling for abilities (non-verbal IQ) of pupils.

Second, the identified school SES effects could reflect selection effects, if schools with a higher school SES just attract better students. Yet some of the previous studies used cross-sectional data (e.g. Agirdag et al., 2012, 2013), which makes it hard to rule out selection effects. While controlling for ability partly correct for this, a longitudinal study can mostly exclude selection bias if the achievement growth is modelled. We will use longitudinal data in this research.

Third, teacher expectations can not only explain the school SES effect (mediation), but the might also intensify the effects of school SES (moderation). If that is the case, teacher expectations can also be theorized as a form of *Matthew effect*. Matthew effect is another mechanism that introduced by Merton (1968), which refers to the accumulated advantage for those who are already have. As such, this contribution will also examine the following moderation effect: [school SES X teacher expectations --> achievement].

Methods

We use survey data gathered as part of the Validiv project. The data were collected between 2011–2013 from 67 primary schools in three urban areas in Flanders, Belgium. In these schools the fourth-grade pupils (aged 8-9) were surveyed at the beginning of the academic year (T1; N=1761) and at the end of the next academic year in the fifth grade (aged 9-10) (T2; *N*=1643). Additionally, all teachers in these schools were asked to fill in a questionnaire in which their teachability expectations of their pupils are survetyed (T1; *N*=1255). The focus of the study was science achievement, which s measured with a standardized test derived from the International Mathematics and Science Study (TIMSS). Teachers expectations regarding their pupils were measured by 31 items of the Teachable Pupil Survey (Kornblau, 1982) and aggregated at school-level. IQ is measured with Raven's Progressive Matrices. The models are estimated with multilevel regression analysis, using SPSS version 22.

Results

First, the results show that school SES have an effect on science achievement at T2, even after controlling for science achievement at T1, pupil-level SES and IQ.

Second, after including mean teacher expectations, school SES is not anymore significantly related to science achievement at T2, which shows that mean teacher expectations mediate the effects of school SES.

Third, the interaction term between School SES and expectations is statistical significant, which shows that teacher expectations moderate/amplify the impact of school SES. That is, an intersection of high expectations and high SES schools results to higher science achievement.

In sum, it seems that teacher expectations not only function as self-fulfilling prophecies that explain why pupils in high SES schools perform better, but they also cause a *Matthew effect* as pupils enrolled in high SES schools accumulate advantages when they are exposed to higher teacher expectations. In other words, Robert Merton scores twice.

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