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Successive teacher expectation effects across the early school years

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ABSTRACT

The capacity for teacher expectation effects to interact and compound across a child's schooling offers a largely untested mechanism for magnifying or minimizing effects. This study examined four types of long-term teacher expectation effects: within-year effects of single teachers, cross-year effects of single teachers, mediated effects of single and multiple teachers, and compounded effects of multiple teachers. Participants were 110 students tracked from preschool through Grade 4 on measures of achievement and teacher expectations. Evidence was found for within-year but not direct cross-year effects. However, path models demonstrated enduring indirect effects of teacher expectations on cross-year achievement. Multiple years of teacher expectation effects were additive in predicting student achievement at fourth grade, with similar effects for teachers' over- and underestimates of student ability. The study extends understanding of longer-term teacher expectation effects.

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For over four decades, since the classic Rosenthal and Jacobson (1968) study, the voluminous research on teacher expectations has shown, in both experimental and correlational studies, that the self-fulfilling prophecy effect does exist in classrooms (see meta-analyses and reviews by Babad, 2009; Brophy, 1983, 1985; Good & Weinstein, 1986; Harris & Rosenthal, 1985; Hattie, 2009; Jussim & Harber, 2005; McKown, Gregory, & Weinstein, 2010; Raudenbush, 1984; Spitz, 1999; Weinstein, 2002). That is, teacher expectations, the beliefs that teachers hold about the potential academic performance of their students, *can* become confirmed in reality. However, in order for the expectations of teachers to have impact on students, they must be expressed in some way. Changes in student performance are hypothesized to result from differential interactions with teachers, which provide disparate learning opportunities for students for whom teachers hold high or low expectations and/or which communicate messages to students about differential ability. Both opportunities to learn and messages about ability can have an impact on student motivation and learning (Brophy & Good, 1974; Weinstein, 2002). There is growing evidence about such mediating processes between teacher expectation and student outcome, in the form of specific teacher behaviors that bring about such effects and in the form of student awareness of differential teacher treatment that signals ability differences. There is also evidence about moderating factors that magnify or lessen effects, such as differential susceptibility to producing such effects (in teachers) and to responding to such effects (in students).

Controversy continues, however, about the size of teacher expectation effects. Some researchers have argued that the effects of teacher expectations on student achievement outcomes within a single school year are, on average, small, resulting in a 5–10% difference in student achievement (Brophy, 1983), whereas other researchers, who have measured moderators such as the time of year of the expectation manipulation or teacher differences such as the level of differential treatment in the classroom or the positivity of class-level expectations, have reported much larger effects (see Bohlmann & Weinstein, 2013; Brattesani, Weinstein, & Marshall, 1984; McKown & Weinstein, 2008; Raudenbush, 1984; Rubie-Davies, 2007). Continued contextual analysis of expectation processes and their effects is crucial to advance understanding of the conditions under which this social influence phenomenon is operative (Weinstein, 2002).

Despite the large body of research on teacher expectation effects, most studies have been conducted within a relatively short time frame, one year or less. Relatively less is known about the longer-term effects either of a single teacher or of multiple teachers. In the sparse research literature available on longer-term relations between teacher expectations and student achievement, no studies have explored how expectation effects, occurring with different teachers over multiple school years, can interact and compound over time. Expectation effects could potentially become more powerful when viewed through a longitudinal lens over the course of a student's achievement history. The capacity for such effects to interact and compound across a child's school career offers one viable and largely untested mechanism for magnifying

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or minimizing such effects, critical to the debate about the strength of teacher expectation effects.

We review this literature in relation to various conceptualizations of the longer-term effects of teacher expectations on student outcomes. We examine the evidence for teacher expectation effects that carry over across school years, both at the elementary and secondary levels. We then address the evidence for the accumulation or dissipation of such teacher expectations effects, most commonly tested as the lingering effects of a single teacher across time. Finally, we suggest a reframing of the "accumulation" question to include the study of multiple teachers. Given the gaps in this literature, the current study investigated the longer-term effects of both single and importantly, multiple teacher expectations on student achievement across five years, from kindergarten to the end of fourth-grade.

Cross-year teacher expectation effects

Although most expectation studies examine within-year expectation effects, there has been growing interest in the *cross-year* effect (i.e., carryover, durability, and sustainability) of a given teacher on future outcomes in subsequent school years. Evidence for cross-year effects exists both at the elementary and secondary level. Rosenthal and Jacobson (1968) found an expectation advantage for the induced intellectual bloomers for the fifth graders that persisted into the second year. Further, although achievement was not measured, Rist (1970) documented a potential mediating factor of cross-year effects in the relatively fixed nature of reading group assignments in terms of curricular exposure and labeling that persisted from kindergarten to second grade.

A study by Alvidrez and Weinstein (1999) demonstrated that preschool teachers' over- and underestimates of children's intelligence at age 4, relative to measured IQ, predicted grade point average (overall beta weight of almost .4) and taking of the Scholastic Aptitude Test 14 years later. Overestimates are defined as teacher expectations which are higher than prior student-measured intelligence or achievement would predict while underestimates are expectations that are lower relative to student IQ or achievement. Thus, beyond the effects of early IQ, teacher expectations of preschoolers' intelligence could predict academic outcomes as students were entering college. Of import, these effects were moderated by type of expectation and quality of the home environment. Specifically, teacher predictions were strongest for underestimated children and weakest for children whose homes were more educationally-oriented. That is, teacher expectations had greater effects on children for whom expectations were low relative to achievement and lesser effects when students came from a home background of rich educational experiences. In a similar study by Sorhagen (2013) across 10 national sites, teachers' over- and underestimates of student achievement in first grade predicted student achievement at age 15. Students from low income backgrounds were most vulnerable to teacher expectations, particularly when their mathematics and language abilities were underestimated (with effects less in reading).

Hinnant, O'Brien, and Ghazarian (2009) found that early teacher expectations at first and third grade predicted child mathematics but not reading performance at fifth grade. In a European study, Gut, Reimann, and Grob (2013) showed that both parent and teacher expectations of children's competence at ages 5–7 predicted academic performance three years later. Of interest, the higher the family adversity and children's behavior problems, the lower the expectations of child competence by parents and teachers and expectations mediated the relation between risk factors and future child performance.

Similarly, at the secondary level, in a study of students from sixth to twelfth grades, Smith, Jussim, and Eccles (1999) documented that seventh grade, but not sixth grade, teacher expectations (in this study defined as perceptions of performance, talent, and effort) predicted the number of nonremedial mathematics courses that students took in high school. For every standard deviation increase in teacher perceptions, students enrolled in an average of 0.25 more mathematics courses in high school. In a sample of ethnically diverse youth aged 6 through 16, Mistry, White, Benner, and Huynh (2007) demonstrated a cross-year effect three years later of teachers' expectations on GPA. In the Dutch context, de Boer, Bosker, and Van der Werf (2010) showed a strong relation between early bias in teacher expectations (the difference between expectations and actual performance) at entry and later student achievement in the fifth year of secondary school. Student academic outcomes after five years were lowest for students whose teacher had a severe negative expectation bias, with a difference in achievement of approximately one full school year, a substantial effect.

These studies underscore that after controlling for the prior achievement or ability of students, *earlier* teacher expectations can have lasting cross-year effects (shorter-term and longer-term) on *later* outcomes, such as achievement, course-taking, and test-taking for college admission. Importantly, context (e.g., moderating effect of home environment in Alvidrez & Weinstein, 1999) and domain (e.g., mathematics but not reading in Hinnant et al., 2009) have been shown to be critical. This predictive ability of teacher perceptions beyond one school year and up to 14 years, at both elementary and secondary levels, is an important phenomenon in its own right.

Do teacher expectation effects accumulate or dissipate?

Given findings for enduring cross-year effects of a single teacher's expectations, researchers have pressed to quantify these lasting links as evidence for or against the strength of expectation effects. Smith et al. (1999) argued that such cross-year effects of single teachers could become stronger, remain stable, or dissipate across time. These authors introduced the term "accumulation" to the expectation literature and defined it as follows: "that a self-fulfilling prophecy triggered at one time exerts an increasingly larger influence over targets as time passes (p. 548)." In contrast, dissipation represents a decreasing effect of the original teacher's expectations on student outcomes over time. Examinations of patterns of beta weights (reflecting the relation between biased earlier teacher expectations and later student achievement) across time and within multiple contexts (single teacher within one school year, a single teacher across subsequent years, and multiple single teachers across multiple years) have yielded conflicting findings, with evidence for dissipation or weakening of effects as well as for stability of effects over time (de Boer et al., 2010; Hinnant et al., 2009; Jussim & Harber, 2005; Jussim, Robustelli, & Cain, 2009; Smith et al., 1999).

Accumulation reframed: multiple teachers, mediating processes, and compounded effects

A deeper understanding of accumulation of expectation effects must look at the dynamics beneath the cross-year influence of a single teacher. This includes a consideration of the interrelations between the expectation effects of multiple teachers (and the compounding of effects) for the same students across school years — both direct and indirect pathways that lie between the first teacher expectation and future student achievement. Brophy (1983) was the first to suggest that even if teacher expectation effects were small in one year, their effects could increase markedly as they compounded across years.

This compounding of effects across multiple teachers and across school years has largely been untested. One exception was a study by Blatchford, Burke, Farquhar, Plewis, and Tizard (1989) that examined the effect of two years of teacher expectations on progress across the three years of infant school in the UK. Progress was defined as "relative change over the year for children with equal scores at the start of the year" (p. 26). By the end of three years, the size of the effect for expectations (an overall rating across three years), even controlling for curriculum coverage, was 0.9 standard deviation units for both mathematics and language, a sizeable effect. Thus, in contrast to Smith et al. (1999), our conceptualization of accumulation revisits this

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