



# Intervening in teachers' expectations: A random effects meta-analytic approach to examining the effectiveness of an intervention



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## ABSTRACT

Experimental studies within the education field are rare. The current study used a random effects meta-analytic approach to examine the effectiveness of a teacher expectation intervention across different schools, grade levels, socioeconomic levels, ethnicities, and gender in terms of student mathematics achievement. Teachers were randomly assigned to intervention and control groups, and through professional development workshops were trained in the practices of teachers who have high expectations for all students. The intervention related to three key areas: grouping and learning experiences, class climate, and goal setting. No matter which grouping variables were employed in the random effects meta-analyses, effect sizes in mathematics achievement for the students whose teachers were part of the intervention group compared with students with control group teachers were large, ranging from  $r = 0.61$ – $0.87$ . The usefulness of the instructional strategies that formed the basis of the intervention is discussed in light of the relevant literature and the educational implications are presented.

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## 1. Introduction

Intervention studies are not common in education, particularly large scale studies that randomly assign teachers and students to a particular condition and that track teachers and students over a number of years in order to examine long-term effects. It is very difficult to control all the variables within a naturally occurring classroom setting but, on the other hand, within a laboratory setting it is not possible to determine whether teachers or students would react within a classroom as they do within a laboratory. For example, in one experimental laboratory study (Peterson, 2000), teachers were assigned examples of students' written language and decided whether the writing was by a boy or a girl, and evaluated the work. Teachers judged the writing more harshly if they believed the written language had been completed by a boy than if they thought the same example had been written by a girl. However, it is not possible to determine whether the outcome would have been similar if teachers were judging the writing of students they knew within their own classrooms.

Further, studies may also randomly assign students without taking account of the teacher and how their instructional practices might influence the results (e.g., Richburg-Hayes, Visser, & Bloom, 2008).

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Researchers (Zhu, Jacob, Bloom, & Xu, 2012) have also criticized studies that have randomly assigned schools to an experimental condition without taking account of class differences within the school. Nevertheless, experimental studies within educational psychology generally are regarded as the “gold standard” because they do provide evidence for the effectiveness of an intervention with far more confidence than studies in which no randomization has occurred. Experimental studies enable claims of causality which cannot otherwise be declared. It is the purpose of the current study to determine the effectiveness of a teacher expectation intervention in relation to achievement outcomes for particular groups of students.

## 2. Intervention studies in the field of teacher expectations

Within the field of teacher expectations, although there have been literally hundreds of studies, few of these have been experimental. The very first study in the field (Rosenthal & Jacobson, 1968), however, was experimental. Teachers were led to believe that randomly assigned students would suddenly increase in their intellectual performance, and, at the end of one year, effects were found for the experimental group when compared with the control group albeit mostly among the younger students. This was an important study because it showed that first, teacher expectations could be manipulated and second, that teacher expectations could affect student academic performance. Nevertheless, the study drew enormous praise and criticism. Having been conducted during the civil rights movement in the US, although the Rosenthal and Jacobson study had only manipulated positive

expectations, several proponents saw low teacher expectations as possibly being responsible for the poor achievement of African American students (Sptiz, 1999). There were several researchers, however, who were severely critical of the study, mostly on methodological grounds (e.g., Elashoff & Snow, 1971; Thorndike, 1968). Nevertheless, both supporters and critics acknowledged that teacher expectations likely existed and would affect student outcomes.

The Rosenthal and Jacobson study led to replication attempts (e.g., Jose & Cody, 1971) with mixed success. However, the initial study also resulted in other researchers examining expectations in the naturalistic classroom setting (e.g., Brophy & Good, 1970, 1974; Weinstein, 1976). Those studies all provided evidence that some teachers behaved differentially towards those for whom they had high or low expectations in ways that led to the perpetuation of student achievement at either high or low levels. Hence, studies in classroom settings blossomed but there were few further experimental studies in the field.

It was not until over a decade after the Rosenthal and Jacobson study that Raudenbush (1984) established through a meta-analysis that when teachers were provided with false information about their students mattered. Manipulation of teachers' expectations was not successful if teachers had known their students for more than two weeks. If teachers were not familiar with their students (as in the original study) then manipulation was possible and experimental effects were found.

Rappaport and Rappaport (1975) attempted to change both students' self-expectations and teachers' expectations for their students. The experimenters randomly assigned 45 low-achieving students into conditions whereby the students, the teachers or both students and teachers received feedback about how successfully the students had completed a task and about their potential. The control group received no such feedback after completing the task. Scores on a reading task following the intervention suggested that although all groups improved compared to the control group, conditions where students were praised showed the largest increase in reading scores. Hence, the study suggested that targeting students' self-expectations may be more effective in improving student attainment than endeavoring to raise teachers' expectations.

Both Babad (1990) and Good and Brophy (1974) attempted to change teachers' expectations by confronting them with data from their own classrooms. From observations in classrooms, Good and Brophy showed teachers that they interacted differentially with students. Some students were consistently ignored by the teachers whereas others were rarely provided the opportunity to make a second attempt at responding to a teacher question if they made an error. In contrast, the teachers often regularly involved other students in class discussions and they prompted and encouraged them when the students gave an incorrect response to a question. The feedback to teachers did result in them providing more equitable feedback to some of their students but the teachers' expectations of their students did not change. There was a strong focus in Good and Brophy's study on changing teacher behavior rather than on changing teacher expectations, and this may have led to the gains for students in terms of more frequent and supportive interactions with their teachers, but not altered teachers' expectations.

Babad (1990, 1998) collected data which showed that students in all of 87 classrooms believed that teachers emotionally favored those for whom they had high expectations compared with those for whom they had low expectations. That is, the student perception was that teachers were warmer and more positive in their interactions with those they expected to do well academically. However, teachers believed that they treated all students equitably and that, if anything, they were warmer and more encouraging towards those for whom they had low expectations. Perhaps, predictably, then, the feedback to teachers of less positive emotional support towards those for whom they had low expectations did not result in them altering their emotional behavior towards low and high expectation students given that the

teachers believed they were already more emotionally supportive towards low expectation students.

Several researchers in the field (Brophy, 1985; Brophy & Good, 1970; Cooper & Good, 1983; Harris & Rosenthal, 1985), however, had established that teachers did interact more positively in terms of both instructional support and affect with those for whom they had high expectations when compared with those for whom they had low expectations. Kerman (1979) isolated 15 of the instructional behaviors which other researchers had identified and in a study which lasted three years, provided teachers with professional development designed to change their interactions with students in five areas each year. By the end of the study, Kerman reported that low achieving students showed statistically significant academic gains and reduced behavioral problems. This study showed that when teachers became more positive and equitable in both their emotional and instructional interactions, student academic achievement benefited.

A further study was conducted by Weinstein and her colleagues (Weinstein, Soule, Collins, Cone, et al., 1991) in which the teachers of ninth-grade at-risk students in one school agreed to participate. All students were in the lowest track. Teachers were trained in practices that Weinstein and her colleagues had identified in earlier studies and which reflected high expectations of students (e.g., Good & Weinstein, 1986; Weinstein, 1986, 1989; Weinstein, Marshall, Brattesani, & Middlestadt, 1982). Six teachers worked with the at-risk students and their academic outcomes were compared with achievement results for previous similar cohorts. The intervention involved expecting students to achieve at high levels, providing them with the option to complete honors courses, and then having the teachers support the students to achieve their goals. By the end of the first year, the experimental group had academically outperformed previous cohorts of similar students and fewer behavioral problems were reported for the target students compared with those in previous cohorts. Unfortunately, the gains were not maintained to the end of the following school year when students were placed with non-project teachers. Nevertheless, as a result of the positive findings, the school agreed to eliminate tracking in their school and to enable the at-risk students to take more advanced courses. The findings also suggested that teachers needed the specific guidance given to project teachers in the first year of the project if student academic improvements were to be maintained.

In a further quasi-experimental study that related closely to the opportunity for lower achievers to be exposed to higher level learning, Mason, Schroeter, Combs, and Washington (1992) showed that when eighth grade students previously labelled as average were placed in pre-algebra mathematics classes alongside high achievers, by the end of the year, they had outperformed their average-level cohorts from previous years. Several (19%) scored as high, or higher, than the high achievers. Further, the average students who had been placed in pre-algebra classes went on to take more advanced mathematics classes in high school and achieved higher grades than had previous cohorts of average achievers in general mathematics classes.

Overall, within the expectation field there has not been a randomized control trial since the early research in the field (e.g., Rosenthal & Jacobson, 1968) and none within naturally occurring classroom situations. In the early studies, teacher expectations were manipulated by researchers; the experiments did not involve teachers working in their regular classrooms. Studies such as those by Good and Brophy (1974) and Kerman (1979) showed that teacher behaviors could be changed to reflect those expressed towards high expectation students but the studies were not experimental. The Weinstein et al. (1991) study showed that when teachers were trained to use specific practices, student achievement increased but, again, although this study did compare students with previous similar cohorts at the same school, it was not experimental. Similarly, although the Mason et al. (1992) study showed strong positive effects when students were moved from average to advanced pre-algebra mathematics classes, again this was a quasi-experimental study with the average students being compared with previous

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