

## Teacher Expectations and Self-Fulfilling Prophecies

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Teacher expectations can create self-fulfilling prophecies. In general, self-fulfilling prophecies occur when false beliefs create their own reality (Merton, 1948). In the classroom, a self-fulfilling prophecy occurs when a teacher holds an initially erroneous expectation about a student, and who, through social interaction, causes the student to behave in such a manner as to confirm the originally false (but now true) expectation. The claim that teacher expectations create self-fulfilling prophecies in the classroom was once controversial; now, such a claim is supported by abundant evidence (see Jussim & Harber, 2005, for a review of the controversies and evidence).

This chapter has two main purposes: (a) to review the evidence that bears on some of the many controversies surrounding teacher expectations; (b) and to review the evidence regarding the educational, social, and psychological processes by which self-fulfilling prophecies in the classroom occur. Accordingly, this chapter is divided into two major sections.

In the first section, we take stock of the existing literature on the role of teacher expectations in producing self-fulfilling prophecies. This includes a review of the Pygmalion study (Rosenthal & Jacobson, 1968) that first demonstrated that teacher expectations may produce self-fulfilling prophecies; the research performed in the immediate aftermath of the controversies surrounding Pygmalion; research examining the conditions under which self-fulfilling prophecies in the classroom are stronger or weaker; and research on whether self-fulfilling prophecies accumulate or dissipate over time. We consider such a review important because, as shall be documented throughout this section, the self-fulfilling prophecy literature is frequently cited in support of conclusions that are not justified by the empirical scientific research.

In the second section, we review the process evidence. How do self-fulfilling prophecies happen? How, when, and why do teachers develop erroneous expectations? How do teachers behave in such a manner as to increase or reduce the likelihood of producing self-fulfilling prophecies? How do students react to such teacher treatment? As shall be seen, far more is known about how and when teachers develop inaccurate expectations and about how they act on their expectations, than about how students react to expectancy-related forms of differential treatment. Therefore, our review of evidence regarding the role of students in the self-fulfilling prophecy draws heavily on

work outside of that focusing on teacher expectation effects. Fortunately, a great deal of research over the last 20 years has addressed the teacher behaviors and practices that affect student motivation and learning. Our review suggests that this research may provide valuable insights, or, at minimum, testable hypotheses, regarding the ways in which student behavioral and psychological reactions to teacher treatment may mediate self-fulfilling prophecies.

### Self-Fulfilling Prophecies in the Classroom: The State of the Literature

In this section of the chapter, we review the classic and controversial Pygmalion study (Rosenthal & Jacobson, 1968). One might wonder why it is necessary to review research that is 40 years old and that has been reviewed amply elsewhere. It is necessary for two reasons. First, Rosenthal and Jacobson's landmark Pygmalion in the Classroom study is still regularly cited in support of conclusions that their data did not actually support. Second, modern discussions of teacher expectations draw upon this literature to reach conclusions that are virtually all over the map, ranging from emphasizing their power to influence students (Gilbert, 1995; Schultz & Oskamp, 2000), to suggesting that such effects, while real, are minimal (Snow, 1995; Spitz, 1999), to denying their existence altogether (Roth, 1995; Rowe, 1995). Thus, in understanding their study, it is particularly important to stick close to the data in order to be quite clear regarding what it found, what it did not find, and what it did not even examine. After revisiting that study, we then review what has been found over the next several decades regarding the power and extent of self-fulfilling prophecies, the conditions under which they are stronger and weaker, and whether they accumulate or dissipate over time.

### The Pygmalion Study

The innovative, influential, and highly controversial Pygmalion study (Rosenthal & Jacobson, 1968) raised the possibility that teacher expectations might create self-fulfilling prophecies. Rosenthal and Jacobson administered a nonverbal intelligence test to all of the children in Jacobson's elementary school (kindergarten through fifth grade). They did not, however, tell the teachers that this was an intelligence test. Instead, special test booklet covers labeled it as a "Test of Inflicted Acquisition," which, an information sheet explained, was a new test being developed at Harvard for identifying children likely to "bloom"—to show a sudden and dramatic intellectual spurt over the upcoming school year. After each test was supposedly graded, Rosenthal and Jacobson then informed each teacher which of his/her students had been identified as potential "late bloomers." These late bloomers (about 20% of the total in the school), however, were actually selected at random. As Rosenthal and Jacobson (1968, p. 70) stated, "The difference between the children earmarked for intellectual growth and the undesigned control children was in the mind of the teacher." They then administered the intelligence test again 1 year later and 2 years later.

### Results: The Oversimplified Version

Teacher expectations created a self-fulfilling prophecy. One year later, the "late bloomers" gained more IQ points than did the control students (henceforth referred to as "bloomers" and "controls"). Even 2 years later, the bloomers' gains still exceeded those of the controls. Although the only initial systematic difference between bloomers and controls was in the teachers' minds, the late bloomers actually showed greater IQ gains relative to controls. The teachers' false beliefs had become true.

Rosenthal and Jacobson found that in IQ, the less we expected, the less we seemed active. Children described in this study had an undue advantage from their teachers' expectations. This was especially true for professional teachers, and for those with high expectations, and for those of high social class. (Weinstein, 1991)

### Results: The Messy Version

There is nothing more to be said about this study. It is a true synopsis of the study (Weinstein, 1991; Gilbert, 1995; Rosenthal & Jacobson, 1968) pattern of results.

One complication in the study was that the experimental group showed dramatic gains in IQ, while the controls showed no gains. In the study, there was a significant difference in IQ. Most students gained an average of 8 IQ points on the test. Although the gains were significant, they were not statistically significant. In fact, the gains were actually smaller than those of the controls.

Second, although the differences between the experimental and control groups were significant, they were not statistically significant. In fact, the differences were particularly dramatic in the first grade.

Other ways to measure the difference between the experimental and control groups were also significant. The difference between the experimental and control groups was of  $d = .30$  (difference in IQ). Typically, effect sizes of  $d = .30$  correlate the mean IQ of the experimental and control groups. The size of the difference was significant.

Although the differences were significant, they were not statistically significant. In the first grade, the difference between the experimental and control groups was significant, but such gains were not statistically significant.

But the story about the late bloomers and controls is not statistically significant. In fact, the late bloomers did not show statistically significant gains relative to controls, but the controls did across all six years.

Rosenthal and Jacobson's (1968) results also showed that the more the control children gained in IQ, the less well adjusted, interesting, and affectionate they were seen by their teachers. Teachers seemed actively hostile toward the students showing unexpected intellectual growth. When described in this manner, these results seem dramatic. Inaccurate teacher expectations provided an undue advantage to some students. Additionally, when children unexpectedly exceeded teachers' expectations, rather than leading to support and reinforcement, this seemed to trigger oppressive teacher responses toward those students. These results seemed to explain how teachers' expectations, and by extension, expectations of managers, college admissions personnel, health professionals, etc., could be a major contributor to the social inequalities associated with race, sex, and social class (see Wineburg, 1987, for a review of perspectives reaching such conclusions; see Weinstein, Gregory, & Strambler, 2004, for a modern example).

### *Results: The Messier and Truer Version*

There is nothing false in the above, oversimplified summary of Rosenthal and Jacobson (1968). It is a true synopsis, and to this day, the study is often described in this manner (Fiske & S. Taylor, 1991; Gilbert, 1995; Myers, 1999; Schultz & Oskamp, 2000). Nonetheless, Rosenthal and Jacobson's (1968) pattern of results was not quite as straightforward as the summary suggests.

One complication was that, on average, both groups of children—late bloomers and controls—showed dramatic IQ gains over the next year. On average, the late bloomers gained about 12 points and the controls gained about 8 points. This is important for at least two reasons. First, in this study, there was no IQ evidence of teachers' expectations decreasing students' level of achievement. Most students gained in IQ, regardless of experimental condition. The control group's average gain of 8 points is quite dramatic—it is about half of a standard deviation on a typical IQ test. Although the study's results did not preclude the possibility of teacher expectations actively harming students' achievement, there was no IQ evidence in this study indicating that such harm actually occurred.

Second, although the across-the-board IQ increases could be described as "dramatic," the differences between the gains of the late bloomers and the controls were not so dramatic. Averaging across all grade levels, that difference was about 4 points. This difference was statistically significant, but in most spheres of daily life, a 4 IQ point difference is not usually considered particularly dramatic.

Other ways to consider the size of the effect also yield a picture of a less than dramatic result. The difference between the experimental and control conditions corresponded to an effect size of  $d = .30$  (difference between the experimental and control group in standard deviation units). Typically, effect sizes of  $d = .30$  or less are considered small (Cohen, 1988). Or, we could simply correlate the manipulation with IQ scores. That correlation is  $r = .15$  (Harris & Rosenthal, 1985). The size of the difference between bloomers and controls was something less than dramatic.

Although the average effect size was not dramatic, there was evidence of some dramatic effects. In the first grade, the bloomer's out-gained the control students by about 15 IQ points; in second grade the difference was about 10 points. In both grades, the control students gained IQ points, but such gains were not even close to those gained by the bloomers.

But the story again becomes more complicated. There was no difference between third-grade bloomers and controls. In fourth grade, bloomers gained more than controls, but the difference was not statistically significant. In fifth and sixth grade, bloomers actually gained fewer IQ points than did controls, but this difference was not statistically significant either. Thus, the overall effect averaged across all six grades was derived almost entirely from the effects in first and second grade.

A theoretically coherent and compelling account might be maintained by arguing that young children were more susceptible to teacher expectation effects. The ability of this explanation to account for Rosenthal and Jacobson's data, however, is more apparent than real.

After 2 years, the *oldest* children (then in sixth grade) showed the largest differences between bloomers and controls. If there was greater susceptibility among younger children, it did not last very long. What mechanism could explain why, among the older children, there was a complete absence of a teacher expectation effect in year 1 but the largest effects obtained in year 2? We cannot answer that question for two reasons—there remains no empirical evidence supporting any such explanation, and no follow-up research has replicated this pattern; as such, we will not discuss it further. Nonetheless, such patterns considerably muddied the interpretive waters surrounding the study.

Other oddities surrounding the original Pygmalion study led some researchers to doubt the credibility of the main self-fulfilling prophecy result. For example, Snow (1995) provided an intriguing re-analysis of the original Pygmalion data. This analysis showed that many of the first and second graders' scores (those among whom the expectancy effect was strongest), were quite bizarre: Some students had pre-test IQ scores near zero, and others had post-test IQ scores over 200. Obviously, however, the children were neither deceased nor geniuses.

Snow (1995) also pointed out that the intelligence test used in Pygmalion was only normed for scores between 60 and 160. If one excluded all scores outside this range, the expectancy effect disappeared. Moreover, there were five "bloomers" with wild IQ score gains: 17–110, 18–122, 133–202, 111–208, and 113–211. If one simply excluded these five bizarre gains, the difference between the bloomers and the controls evaporated.

#### *What Can Be Concluded From The Pygmalion Study?*

What can or cannot be concluded from Pygmalion is clearly a matter of scientific opinion and judgment. The harshest critics might say "nothing." The strongest advocates might say that it provides profound insight into social problems and inequality. Both reactions—uncritical acceptance and overgeneralization on one hand; vilifying criticism on the other—are probably too extreme. Therefore, in this section, we provide answers to questions regarding the Pygmalion study using the hard data from the original study.

Were self-fulfilling prophecies powerful and pervasive? They were not. The overall effect size equaled a correlation of .15. The mean difference in IQ gain scores between late bloomers and controls was four points. These are not powerful effects. Nor were they pervasive. Significant teacher expectation effects only occurred in two of six grades in year 1 and in one of five grades in year 2. Self-fulfilling prophecies did not occur in eight of eleven grades examined.

Were powerful expectancy effects ever found? Yes. The results in first and second grade in year 1 (15 and 10 point bloomer-control differences) were quite large. Were teacher expectations typically inaccurate? Rosenthal and Jacobson (1968) provided no information about the typical accuracy or inaccuracy of teacher expectations. Did demographic-based stereotypes unduly bias expectations and perceptions? Rosenthal and Jacobson did not assess the extent to which student demographics or social stereotypes influenced teacher expectations. Therefore, the study provided no data directly bearing on the issue of whether stereotypes bias teacher expectations.

Were self-fulfilling prophecies harmful? Rosenthal and Jacobson (1968) only manipulated positive expectations. They showed that false positive expectations could be self-fulfilling. It would have been unethical to instill false negative expectations. Therefore, they did not assess whether

false negative expectations could be self-fulfilling. There was some evidence that the self-fulfilling prophecies were not harmful.

Did the study show that teacher expectations influenced student IQ? There was no consistent effect. Consistent with the hypothesis, there were significant effects in first and second grade in year 1 and in first and second grade in year 2. In first and second grade in year 1, the only significant effects in the study, the only

#### *The Scientific Conclusion*

For all the drama (and the criticisms) to quite modest effects, the contribution involved new areas of research (Rosenthal & Rubin, 1968). Nonetheless, the study has been of business for many years as a self-fulfilling prophecy.

#### *The Aftermath of the Study*

Given the controversy (see reviews by Block & Rubin, 1978), the criticisms of the study, and whether teacher expectations experimentally influenced student IQ are still debated.

Even these studies consistently demonstrated that the effects were consistently denied (Rosenthal & Rubin, 1978). The study demonstrated that the effects were interpreted as chance differences.

This controversy over the first 345 experiments in eight categories of self-fulfilling prophecies.

#### *Experimental Design*

Although the study was experimentally induced, it did not open the question of whether this question

false negative expectations undermine student IQ or achievement. It is important to note that there was some evidence that the teachers acted negatively towards controls who gained; however, the self-fulfilling prophecies they found were beneficial—they *increased* student IQ scores.

Did the study show that more powerful self-fulfilling prophecies occur among younger children? There was no simple linear relationship between age and self-fulfilling prophecy effect size. Consistent with the age hypothesis, the largest effects in the first year of the study were for students in first and second grade. However, inconsistent with this hypothesis were results showing no significant effects in grades 3 through 6 in the first year of the study; and, in the second year of the study, the only significant effects occurred in sixth grade (among the oldest children).

### *The Scientific Contribution of Rosenthal and Jacobson*

For all the drama and controversy, the study's actual findings ranged from nil (if one believes the critics) to quite modest, if taken at face value. This is clearly a case, however, where a study's contribution involved more than its specific results. Rosenthal and Jacobson's (1968) study opened up new areas of research in education and psychology (Brophy, 1983; Brophy & Good, 1974; Snyder, 1984). Nonetheless, given the controversy surrounding the study's actual results, the first order of business for many researchers was to evaluate the validity of the basic teacher expectation/self-fulfilling prophecy phenomenon. That research is summarized next.

### *The Aftermath of Pygmalion*

Given the controversies surrounding the Pygmalion study, numerous replications were attempted (see reviews by Brophy & Good, 1974; Rosenthal, 1974; Spitz, 1999). Because of the methodological criticisms of the study, many of the early replications focused not on the general question of whether teacher expectations can be self-fulfilling, but on narrow attempts to discover whether experimentally-induced erroneous teacher expectations actually had reliable self-fulfilling effects on student IQ and achievement.

Even these studies initially evoked considerable controversy. Only slightly over one third consistently demonstrated a statistically significant expectancy effect (Brophy, 1983; Rosenthal & Rubin, 1978). This pattern seemed to resolve nothing. It was often interpreted by the critics as demonstrating that the phenomenon did not exist because support was unreliable. Proponents interpreted this result as demonstrating the existence of self-fulfilling prophecies because, if only chance differences were occurring, replications would only succeed about 5% of the time.

This controversy was eventually resolved by Rosenthal and Rubin's (1978) meta-analysis of the first 345 experiments on interpersonal expectancy effects. The 345 studies were divided into eight categories. Z-scores representing the combined expectancy effect in all studies in each category were computed. The median of the eight combined Z-scores was 6.62, indicating that the self-fulfilling prophecy was real.

### **Experimentally-Induced versus Naturally-Occurring Self-Fulfilling Prophecies**

Although the Rosenthal & Rubin (1978) meta-analysis settled the question of whether experimentally-induced inaccurate teacher expectations produced self-fulfilling prophecies, it left open the question of the extent to which self-fulfilling prophecies occur naturally. An answer to this question cannot be based on experimental research that intentionally misleads teachers to

develop erroneous expectations, because teachers being intentionally misled by researchers is not a naturally-occurring process. Instead, conclusions regarding what happens under naturalistic conditions must be based on research that examines relations between naturally-occurring teacher expectations and student achievement.

Of course, the causal inferences reached on the basis of naturalistic research can rarely be as strong as those based on experimental research. Much naturalistic research on teacher expectations (see, e.g., reviews by Jussim & Eccles, 1995; Jussim & Harber, 2005), however, has gone to considerable methodological and statistical lengths to rule out alternative explanations for why teacher expectations predict student achievement. For example, most studies have used longitudinal designs in which teacher expectations are assessed early in the year and student achievement is assessed later in the year, or, sometimes, even in following years. Because the future cannot possibly cause the past, such designs eliminate the possibility that student achievement late in the year caused teacher expectations early in the year.

Longitudinal designs, however, still leave open third variable explanations. Perhaps some third variable or set of variables cause both teacher expectations and student achievement. If so, failing to include such variables in a naturalistic study of teacher expectations might lead to an overestimate of the power of self-fulfilling prophecies (which, by definition, involve teacher expectations *causing* student achievement). Nearly all naturalistic studies, however, have included many of the most likely potential third variables as controls (e.g., students' prior achievement, motivation, and demographic characteristics). This means that many of the most likely contenders for third variables have been ruled out in most naturalistic studies because they have been statistically controlled.

To what extent, then, do naturally-occurring teacher expectations create self-fulfilling prophecies? Table 17.1 presents the effect sizes obtained in every published naturalistic study that examined the effect of teacher expectations on student achievement within a school. Self-fulfilling prophecy effect sizes range from 0 to .4, with most falling between .10 and .20. Depending on how it is calculated, the overall mean effect size is between .07 and .17 (see Table 17.1 for more details).

Table 17.1 also highlights an extremely important aspect of the existing data. The larger the sample size, the smaller the self-fulfilling prophecy effect size (on average). Indeed, the correlation between sample size and effect size is  $-.72$ . This pattern strongly suggests that the larger effect sizes obtained in smaller scale studies may reflect the inherently greater variability of statistics based on small samples rather than any substantively generalizable evidence of larger self-fulfilling prophecies.

Effects of .07 to .17 are not very powerful by any standard. They would fall in the bottom third of effect sizes obtained in 380 meta-analyses covering a wide range of psychological phenomena (Hemphill, 2003). In fact, .17 is below the median of effect sizes found in social psychology, and .07 would be among the smallest effect sizes found in social psychology (Richard, Bond Jr., & Stokes-Zoota, 2003). In absolute terms, even an effect of .20 in a naturalistic study means that only 10% of students, on average, are substantially changed by self-fulfilling prophecy effects. This is, of course, the same thing as saying 90% are not substantially changed.

Nonetheless, self-fulfilling prophecies are not restricted to situations in which experimenters intentionally mislead teachers into developing false expectations. Nearly all naturalistic studies have found evidence of self-fulfilling prophecies. Indeed, the unweighted average effect size of  $r = .17$  is very close to the overall effect size of  $r = .15$  obtained in the original Rosenthal & Jacobson (1968) study and the  $r = .23$  effect size obtained in experimental studies in which teacher

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Table 17.1 Effect and Sample Sizes in Naturalistic Studies of the Self-Fulfilling Effects of Teacher Expectations

Study	Self-Fulfilling Prophecy Effect Size	Sample Size
Williams, 1976 <sup>a</sup> Boys	.07	5,458
Williams, 1976 <sup>a</sup> Girls	.00	5,072
Chapman & McCauley, 1993 <sup>b</sup>	.03	4,308
West & Anderson, 1976 <sup>a</sup>	.12	3,000
Jussim & Eccles, 1992 <sup>a</sup>	.13	1,288
Jussim, 1989 <sup>a</sup>	.13	443
Doyle et al (1972) <sup>b</sup>	.30	245
Brattesani et al (1984) <sup>c</sup>	.26	234
Trouilloud et al (2002)	.28	173
Kuklinski & Weinstein (2001), 5th Grade <sup>a</sup>	.19	140
Kuklinski & Weinstein (2001), 3rd Grade <sup>a</sup>	.20	124
Kuklinski & Weinstein (2001), 1 <sup>st</sup> Grade <sup>a</sup>	.40	112
Palardy (1969) <sup>b</sup>	.14	107
Seaver (1973) <sup>b</sup>	.15	79

Note. The simple average of effect sizes, unweighted by sample size is .17. The sample weighted average is .07. For this table, the correlation between sample size and self-fulfilling prophecy effect size is -.72. Williams (1976) and Chapman & McCauley (1993) reported more than one self-fulfilling prophecy effect size. This table simply averaged them together. Williams (1976) performed analyses separately by student sex, and because these are two separate samples, are treated as two studies. Kuklinski & Weinstein (2001) is treated as three separate studies because they performed analyses separately for first, third, and fifth graders. They actually reported two separate effect sizes for each grade, which, for simplicity, we have averaged together for this table.

<sup>a</sup> Effect size reported as standardized regression coefficient.

<sup>b</sup> These were quasi-experiments. Effect sizes are therefore reported as correlations between quasi-experimental conditions (reflecting teacher expectations) and student achievement.

<sup>c</sup> Although this was a correlational study, path coefficients were not reported. Instead, they reported the r-squared increment obtained when adding teacher expectations to a model that included control variables. This table reports the square root of this value to more closely approximate a standardized regression coefficient.

expectations were induced within the first two weeks of the school year (Raudenbush, 1984). Even accounting for the possibility of publication bias (significant effects are more likely to be published), self-fulfilling prophecies have been found sufficiently often in naturalistic research that it currently seems reasonable to conclude that they are indeed very widespread. Naturally-occurring teacher expectations can be, and often are, self-fulfilling. On average, however, such effects are relatively modest.

#### *Under What Conditions Do More Powerful Self-Fulfilling Prophecies Occur?*

Although the evidence does not justify broad generalizations emphasizing the power of expectations, there still may be some conditions where self-fulfilling prophecies are larger than usual. This section, therefore, reviews some of the evidence on moderators of self-fulfilling prophecies.

#### *Timing of False Expectations*

Experimental inductions of false teacher expectations early in the year produce stronger self-fulfilling prophecies than experimental inductions later in the year (Raudenbush, 1984). This



self-fulfilling prophecy refers to high expectations improving student outcomes and “negative” self-fulfilling prophecy refers to low expectations harming student outcomes. A conclusion that “negative self-fulfilling prophecies were more powerful,” therefore, means that negative teacher expectations harmed students’ achievement more than positive ones helped students’ achievement; a conclusion that “positive self-fulfilling prophecies were more powerful” means that positive teacher expectations helped students’ achievement more than negative ones harmed students’ achievement.

*Do “High Bias” Teachers Produce More Negative Self-Fulfilling Prophecies in Gym?* Babad, Inbar, and Rosenthal (1982) examined the power of negative and positive self-fulfilling prophecies among 26 teachers and 202 students in gym classes. They found no evidence of self-fulfilling prophecies at all among “low bias” teachers (those low in dogmatism and cognitive rigidity).

Among high bias teachers, there were: (a) more powerful negative self-fulfilling prophecies for one of three student outcomes (distance jumping); (b) more powerful positive self-fulfilling prophecies for sit-ups and pushups; (c) no evidence of self-fulfilling prophecy for running speed outcomes. Their results, therefore, did not provide clear evidence that either positive or negative self-fulfilling prophecies were more powerful.

*Under- Versus Overestimating IQ* Sutherland and Goldschmid (1974) assessed six first- and second-grade teachers’ expectations 2 months into the school year. Ninety-three students were administered two intelligence tests at each of two time points: 2 months and 7 months into the school year. The relative power of positive versus negative self-fulfilling prophecies was tested among the subset of students for whom teacher expectations were discrepant from their actual IQ test scores. Discrepancies were identified in two ways: teacher “overestimates,” which meant that the teacher’s expectations were higher than the student’s IQ score (e.g., a teacher describing a student with a below average IQ score as “average”), and teacher “underestimates,” which meant that the teacher’s expectation were lower than the student’s IQ score (e.g., a teacher describing a student with above average scores as “average”).

Sutherland and Goldschmid (1974) found stronger evidence of negative than of positive self-fulfilling prophecies. Teacher underestimates had an effect of about  $r = .5$  on intelligence test scores, whereas teacher overestimates had effects of under  $r = .2$ . The interpretation of this difference is muddled, however, because the negative expectations probably more extremely underestimated students than the positive expectations overestimated them. Negative expectations consisted of rating students with IQ scores of 120–135 as “average.” Positive expectations consisted of rating students with IQ scores of 80–95 as “average.” An average IQ score is 100. Thus, an “average” rating probably underestimates a student with a score of 120–135 more (i.e., 20 to 35 points) than it overestimates a student with a score of 80–95 (i.e., 5 to 20 points). The greater power of negative versus positive self-fulfilling prophecies that emerged, therefore, may have reflected the greater inaccuracy of negative expectations as operationalized among their particular sample, rather than any generally greater power of negative expectations.

*Under- vs. Overestimating Achievement in Math Classes* The third study to address the relative power of positive vs. negative teacher expectations (Madon et al., 1997): (a) explicitly compared inaccurately low expectations to equally inaccurate high expectations, and (b) performed this comparison both overall and separately for students with histories of high and low achievement.

Polynomial regression (Judd & McClelland, 1989) was used to test whether teacher over-

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underestimates more strongly predicted changes in students' math achievement. The slope of the relationship of teacher expectations to student achievement was about .3 among the most highly overestimated students and about .1 among the underestimated students. This pattern indicated greater power of positive than of negative self-fulfilling prophecies.

In addition, Madon et al. (1997) examined this pattern separately for students with prior records of high or low achievement. For high achievers, teacher underestimates had almost no self-fulfilling prophecy effect and teacher overestimates produced self-fulfilling prophecy effects of about .2. For low achievers, teacher underestimates produced self-fulfilling prophecy effects of about .1-.2 and teacher overestimates produced self-fulfilling prophecy effects of about .4. In sum, Madon et al. (1997) showed that positive expectancies tend to be more powerful than negative expectancies, especially for low-achieving students.

*The Predictive Validity of Pre-school Teacher Expectations* Alvidrez and Weinstein (1999) examined the extent to which pre-school teacher beliefs about student intelligence predicted the overall high school GPAs of 63 students (all of whom were 4 years old), in the context of a model that controlled for IQ and parental SES, both measured at age 4 (previous analyses showed that neither student gender nor ethnicity predicted GPA beyond the effects of IQ and SES). The results were quite striking: not only did the pre-school teacher expectations predict high school grades achievement (overall effect of nearly .4), polynomial regression showed that the largest effects occurred for negative expectations (underestimates) and that the effects of positive expectations were near zero.

Why did such a pattern occur? Several limitations to their study render its interpretation ambiguous. First, IQ tests among 4 year olds lack the reliability and validity of those administered to older people (e.g., Neisser et al, 1996). Furthermore, IQ tests have come a long way since the 1960s, which is when Alvidrez & Weinstein's (1999) data was collected (Neisser et al., 1996).

This raises the possibility that teacher perceptions at age 4 were sufficiently accurate to recognize student characteristics predictive of achievement that were not fully captured by the IQ test. Especially because student grades are often influenced by nonacademic aspects of behavior, such as cooperativeness, disruptiveness, and obedience (Jussim, Smith, Madon, & Palumbo, 1998), and because the personality characteristics underlying these behaviors are often strikingly consistent across the lifespan (e.g., Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), it is possible that ratings provided by teachers of pre-schoolers had predictive validity not accounted for by the IQ tests.

Furthermore, Alvidrez and Weinstein (1999) acknowledged many of these issues and clearly stated that their study was not capable of distinguishing between accuracy and self-fulfilling prophecy as explanations for the patterns they observed. We agree, but would go further. They provided no data and little in the way of speculation regarding how the expectations held by pre-school teachers for 4-year-old children could actually cause achievement in high school (beyond a general reference to the potential for self-fulfilling prophecies). Far more long term, longitudinal research is needed before any conclusion that they identified a causal process could be justified (a point they themselves emphasized in their discussion section).

*Conclusion: Are Positive or Negative Teacher Expectations More Powerful?* It appears that Babad et al. (1982) found no clear and consistent pattern; Sutherland and Goldschmid's (1974) study was biased in the direction of finding stronger negative expectancy effects; and Alvidrez and Weinstein's (1999) study could not disentangle self-fulfilling prophecy from accuracy. Madon, et al. (1997) provided an unbiased test of the power of positive versus negative self-fulfilling prophecies, and

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examined this issue among a much larger sample than was included in any of these other prior studies (indeed, larger than in all of them combined). Whether the evidence from these four studies tilts in favor of the power of positive expectations or of negative expectations, therefore, is currently a matter of individual scientific judgment. Clearly, however, despite the frequency with which conclusions emphasizing the inordinate power of negative expectations appear in the literature (e.g., Darley & Fazio, 1980; Weinstein et al., 2004), it is premature to conclude that the main effect of self-fulfilling prophecies is to harm the achievement of low expectancy students.

#### *Do Self-Fulfilling Prophecies Accumulate?*

*The Logic of Accumulating Self-Fulfilling Prophecies* Many reviews and perspectives have suggested that empirical studies underestimate self-fulfilling prophecies, because expectancy effects may accumulate over time and/or over multiple perceivers (Claire & Fiske, 1998; Snyder, 1984; Weinstein & McKown, 1998). The logic of accumulation is straightforward:

1. Small effects are typically obtained in both short-term (1 hour) laboratory studies of self-fulfilling prophecies and teacher expectation studies conducted over a school year.
2. Although small in such contexts, many targets may be subjected to the same or similar erroneous expectations over and over again.
3. Effects that are only small in any one context will likely accumulate across multiple contexts to become quite large.

*The Logic of Dissipation* Despite the apparent compelling nature of this sort of analysis, there are equally good reasons to expect self-fulfilling prophecies to dissipate, rather than accumulate. Although an extended discussion of those reasons is beyond the scope of this chapter (but see, e.g., Jussim & Harber, 2005; Smith et al., 1999), two will be briefly discussed here. First, there is regression to the mean. A student whose achievement is enhanced or suppressed by a self-fulfilling prophecy effect is likely to return to their prior level of achievement, unless some process operates to maintain or increase the original self-fulfilling prophecy effect.

Second, there is self-verification (Swann, 1987), which refers to the idea that people are highly motivated to see themselves in a manner consistent with their own long-standing and deep-seated self-views, and to convince others to view them much as they view themselves. The self-verification motive may render many people resistant to confirming others' inaccurate expectations.

Thus, the bottom line is data, not argument. To what extent do the self-fulfilling effects of teacher expectations accumulate or dissipate?

*The Data Supports Dissipation* Four studies to date have addressed whether the self-fulfilling prophecy effects of teacher expectations accumulate or dissipate over time. All have provided more evidence of dissipation than accumulation. The first, Rosenthal and Jacobson's (1968) Pygmalion study, which has already been discussed, found about a 4 point IQ difference between bloomers and controls in the first year of the study, but less than a 3 point difference in the second year.

An observational study (Rist, 1970), which was interpreted at the time as demonstrating a "caste" system which creates and then exacerbates social class differences in achievement, actually failed to provide such evidence. The main "evidence" of self-fulfilling prophecy provided in this research was teacher seating patterns of children in kindergarten through second grade ("evidence" is in quotes here, because this constitutes teacher treatment, not student achievement;

a truly hardnosed critic might therefore conclude that the study provided no evidence whatsoever that directly bears on self-fulfilling prophecies). Regardless, there were fewer, not more, seating differences between social class groups over time, thereby providing no evidence of accumulation, and, instead, evidence suggesting dissipation.

Two quantitative studies (Smith et al., 1999; West & Anderson, 1976) also found dissipation. Smith et al. followed students for up to 6 years (from sixth through 12th grade) and found that, contrary to the accumulation hypothesis, the effects of sixth-grade teacher expectations on 12th grade achievement were smaller, not larger, than their effects on sixth- and seventh-grade achievement. West and Anderson followed students from ninth through 12th grades, and found essentially the same pattern (smaller, not larger, effects of ninth-grade teacher expectations on 12th-grade achievement than on ninth-grade achievement).

*Conclusions About Accumulation and Dissipation* The story one can tell on the basis of the idea that self-fulfilling prophecies accumulate is very appealing because it seems to provide a scientific basis for understanding many sorts of injustices and inequalities (e.g., Snyder, 1984; Weinstein et al., 2004). Unfortunately, regardless of how apparently compelling such stories may sound, they are not supported by the existing data. The evidence is quite clear that self-fulfilling prophecies in the classroom generally dissipate, not accumulate, over time.

#### *Pattern and Extent of Self-Fulfilling Prophecies in the Classroom: Knowns and Unknowns*

The first part of our review has, we hope, made clear what conclusions are and are not justified on the basis of existing teacher expectation research. Self-fulfilling prophecies do occur, but such effects are, in general, quite modest, corresponding, on average, to effect sizes of about .1 to .2. Even the original "dramatic" Rosenthal and Jacobson (1968) study only produced an average effect size of .15. In fact, given publication bias in favor of significant results, and the pattern clearly demonstrated in Table 17.1 showing that naturalistic studies with larger sample sizes produce smaller self-fulfilling prophecy effects, overall average effects in real classrooms are more likely to be near the lower end of our estimate.

Nonetheless, self-fulfilling prophecies sometimes exceed these average small effects. Effect sizes have been consistently larger among students in first and second grade. Whether such effects reflect a generally greater susceptibility to self-fulfilling prophecies among younger students, or a generally greater susceptibility to self-fulfilling prophecies among anyone in new situations, however, is unclear (and these possibilities are not necessarily mutually exclusive). Self-fulfilling prophecies are also considerably stronger among underachieving students and students from stigmatized social backgrounds.

Although considerable scholarship seems to take for granted the idea that self-fulfilling prophecies produce primarily negative effects (Darley & Fazio, 1980; Gilbert, 1995; Weinstein et al., 2004; Weinstein & McKown, 1998), the empirical evidence on this issue is decidedly mixed. Clearly, additional research on whether self-fulfilling prophecies tend to be mostly beneficial or mostly harmful is needed.

Another area in which the scholarship is mixed is on the topic of accumulation, with many articles emphasizing the power of accumulation (e.g., Claire & Fiske, 1998; Snyder, 1984; Weinstein et al., 2004; Weinstein & McKown, 1998), and a smaller number emphasizing dissipation (Smith et al., 1999; Jussim & Harber, 2005). Here, however, the data are quite clear. Narrative reviews

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notwithstanding, every study that has empirically examined the accumulation of self-fulfilling prophecies in the classroom has found that, rather than accumulating, they dissipate over time.

### Self-Fulfilling Prophecy Processes

Based on the extant literature, it is clear that self-fulfilling prophecies do exist, and that they can occur in naturalistic settings. Therefore, in this section, we discuss how naturally-occurring self-fulfilling prophecies occur in the classroom. Many researchers have proposed models of the self-fulfilling prophecy process (Brophy & Good, 1974; Cooper, 1979; Cooper & Good, 1983; Darley & Fazio, 1980; Harris & Rosenthal, 1985; Jussim 1986; Rosenthal, 1974). Despite their differences, all agree on three main steps:

1. Teachers develop erroneous expectations.
2. Those expectations lead teachers to treat high expectancy students differently than they treat low expectancy students.
3. Students react to this differential treatment in such a manner as to confirm the originally erroneous expectation.

#### *Step 1: Teachers Develop Erroneous Expectations*

Because accurate expectations cannot be self-fulfilling (Jussim, 1991; Merton, 1948), self-fulfilling prophecies start with inaccurate expectations. Why do teachers' expectations go wrong?

Although this is a reasonable and necessary question to address, the bigger phenomenon is that teacher expectations are usually accurate. In this chapter, accuracy refers to teacher expectations predicting but not causing student achievement. Because teachers' expectations typically predict student achievement more often because they are accurate than because they are self-fulfilling (Brophy, 1983; Jussim & Harber, 2005), it is important to discuss some of the factors that contribute to teacher accuracy before understanding sources of inaccuracy.

#### *Empirical Evidence of Accuracy*

There are two ways that the existing research can provide information about the accuracy of teacher expectations. First, the results of naturalistic studies that simply correlated teacher expectations with student achievement can be compared with the effects of teacher expectations obtained in experimental studies. Such comparisons provide indirect evidence for high accuracy because the correlations were typically much higher (generally in the .4 to .8 range) than were the expectancy effect sizes (typically in the .1 to .2 range; see, e.g., Brophy, 1983; Jussim, 1991; Jussim & Harber, 2005, for reviews). The difference between the correlation and the effect size constitutes an indirect way to estimate the accuracy of teacher expectations, because this difference represents predictive accuracy without self-fulfilling influence (Jussim et al., 1996). By this metric, about 75% of the overall predictive validity of teacher expectations for standardized test scores reflects accuracy and the remaining 25% reflects self-fulfilling prophecy.

The second way of evaluating the accuracy of teacher expectations is to empirically assess it within a study (rather than compare results across studies). The basic methodology involves: (a) assessing teacher expectations (typically early in the school year); (b) assessing student achievement in the year prior to the assessment of teacher expectations; (c) assessing student outcomes at the

end of the school year in which teacher expectations were assessed (most typically standardized test scores, but sometimes, grades, course selections, etc.); and (d) examining the extent to which teacher expectations predicted but did not cause student outcomes.

The logic here is straightforward. The correlation between teacher expectations early in the year and student achievement at the end of the school year represents the overall predictive validity of teacher expectations. That predictive validity can come from only two sources, which are both mutually exclusive and exhaustive: (a) teacher expectations cause student achievement (e.g., through self-fulfilling prophecies), and (b) teacher expectations predict, but do not cause, student achievement. To the extent that both teacher expectations and student achievement are caused by third variables, they will correlate without causing one another.

The standardized path coefficient (whether obtained in regression, latent variable models, hierarchical linear models, or any structural equation technique) linking teacher expectations to student achievement in the context of a model that controls for plausible sources of accuracy (student prior grades and achievement, demographics, motivation, etc.) represents the best estimate of a naturally occurring self-fulfilling prophecy. It represents the best estimate of the extent to which teacher expectations early in the year predict *changes* in student achievement by the end of the school year (we know this because prior achievement is controlled). The difference between the overall predictive validity of teacher expectations (the correlation with achievement), and the standardized path coefficient estimating self-fulfilling prophecy, equals the extent to which teacher expectations predicted but did not cause student achievement. Prediction without causation is *exactly* how we define accuracy (see, e.g., Jussim, 1991, for a detailed example demonstrating how accuracy mathematically and statistically equals the correlation minus the path coefficient linking teacher expectations to students' future achievement).

The bottom line, however, has been that studies using this approach yielded essentially the same results as the cross-study comparisons (see reviews by Brophy, 1983; Jussim & Eccles, 1995). About 75% of the correlation between teacher expectations and student future achievement reflects accuracy, and about 25% reflects self-fulfilling prophecy.

#### *Why Are Teachers' Expectations Typically Accurate?*

Students' performance is so frequently evaluated, in such a variety of ways, that it should not be particularly surprising that teacher accuracy is quite high. Whether it is state-mandated standardized achievement tests, the SATs, or simply in-class assignments, tests, and quizzes, children's performance is so repeatedly evaluated and tested in school that teachers typically have abundant opportunities to obtain reasonably clear and objective information about students' achievement. Given this wealth of available information, it would be extraordinary if most teachers did not have at least a reasonably good idea of where most students stand with respect to their level of learning and achievement.

The Realistic Accuracy Model (RAM; Funder, 1995) provides one theoretical basis for understanding why teachers are so accurate in predicting student achievement. RAM specifies four steps as necessary to achieve accuracy. For one person's judgments about another's underlying attributes (in this case, academic competence) to become accurate, the underlying attribute must generate observable behavior. In most classrooms, where teachers give tests, quizzes, homework assignments, projects, and observe in-class participation, it does generate observable behavior. Second, that evidence has to be available to the (generic) perceiver (in this case, the teacher). Such performances are abundantly available to the teacher. Third, the perceiver/teacher must detect the

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#### *Inaccuracy*

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evidence. In general, teachers detect student performance. Fourth, the perceiver/teacher has to actually use the detected evidence/cues (and weight them appropriately) for arriving at an accurate judgment. Although there may be some slippage here, teachers often have a highly organized system of weighting performances (e.g., homework is 10%, participation is 10%, quizzes are 30%, and tests are 50%), which helps them to assign a more accurate grade. Whether any particular weighting system is "appropriate" may be subject to debate, but, fortunately, the precise manner in which such different criteria are weighted rarely matters much anyway (Dawes, 1979).

### *Inaccuracy*

So, why are teachers ever inaccurate? First, students change. They mature, their goals change, their home life changes, etc., in ways that can affect their performance. Therefore, even expectations based on clear, objective, and valid past information will not likely perfectly correspond to every student's future performance. Second, teachers' memories for students' past achievements may be imperfect. Their expectations may color and distort their interpretations of student achievement (Jussim, 1989; Jussim & Eccles, 1992; Williams, 1976). Like other people lacking specific training in statistics, logic, or decision-making, the ways in which they evaluate information, and especially make predictions, are subject to the same systematic errors and biases that characterize many laypeople (e.g., Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980).

Third, social stereotypes may undermine the accuracy of teacher expectations. We do not want to overstate this, because the existing research strongly suggests that, for the most part, teachers' perceptions of differences between students from different demographic groups are quite accurate (Jussim et al., 1996; Madon et al., 1998; Williams, 1976). For example, two studies examined the accuracy of teacher expectations for African American students and for students from lower social class backgrounds (Jussim et al., 1996; Madon et al., 1998). They found that teachers perceived differences between different groups that closely corresponded to those groups' actual differences in prior grades and achievement tests, a pattern replicated in subsequent research. Although such findings appear to conflict with narrative reviews emphasizing the inaccuracy and biasing effects of stereotypes (APA, 1991; Aronson, 1999; Jones, 1986, 1990), they are consistent with a number of meta-analyses all showing that biasing effects of stereotypes on person perception judgments tend to be quite small, typically averaging an  $r$  of about .1 (Davison & Burke, 2000; Kunda & Thagard, 1996; Mazella & Feingold, 1994; Sweeney & Haney, 1992; Swim, Borgida, Maruyama, & Myers, 1989).

Nonetheless, there is also evidence that, at least sometimes, social stereotypes and even diagnostic labels (e.g., "learning disabled") lead to inaccurate expectations for some students (Jussim et al., 1998; Jussim et al., 1996; Madon et al., 1998). For example, teachers often assume girls exert more effort than do boys, even though boys and girls exert similar effort (Jussim et al., 1998; Jussim et al., 1996; Madon et al., 1998). This turns out to be important because teachers often reward higher (perceived) effort with higher grades, which may seem reasonable until one keeps in mind that teacher perceptions of effort are themselves subject to bias and distortion. The common pattern of girls receiving higher grades than boys (on average) throughout their school years (e.g., Kimball, 1989; Pomerantz, Altermatt, & Saxon, 2002) may, therefore, be partially explained by the common pattern of sex stereotypes leading teachers to misperceive girls as trying harder than boys, and then rewarding them with higher grades. Whether erroneous perceptions of effort are also self-fulfilling (do erroneously high perceptions of effort actually cause greater effort?) is unknown because no research has addressed this question.

In summary, inaccurate expectations are the necessary starting point for self-fulfilling prophecies to occur. Although abundant research demonstrates moderate to high accuracy of teacher expectations, none demonstrates perfect accuracy. The relatively limited degree to which teacher expectations are usually inaccurate helps explain relatively modest overall self-fulfilling prophecy effects. At the same time, the pervasiveness of some degree of inaccuracy helps explain the pervasive occurrence of (modest) self-fulfilling prophecies.

### *Step 2: Teacher Expectations Lead to Differential Treatment*

*Four Major Types of Differential Treatment* Teachers' expectations lead them to treat their students differently. Rosenthal (1974) identified four broad ways in which teachers treat high expectancy students differently than they treat low expectancy students (see Harris & Rosenthal, 1985 for a meta-analysis; Brophy, 1983; Brophy & Good, 1974; Jussim, 1986, for reviews). These different types of treatment, which are discussed next, are generally referred to as climate, feedback, input, and output.

First, teachers provide a more supportive emotional climate for high expectancy students. They are warmer, smile more, and offer them more encouragement. Second, teachers provide clearer and more favorable feedback to high expectancy students. Feedback (positive or negative) received by high expectancy students also tends to focus on performance. In contrast, low expectancy students receive considerably more feedback that is unrelated to achievement. Instead, feedback to low expectancy students is more likely to focus on behavior, cooperativeness, aggression, and so on. In addition, high expectancy students are praised more and criticized less than are low expectancy students.

Third, teachers often provide greater input into high expectancy students' education. They spend more time with and provide more attention to high expectancy students. They also may teach more material to high expectancy students. Fourth, teachers often provide high expectancy students with more opportunities for output. They call on high expectancy students more often; give high expectancy students more hints and prompts when they seem hesitant and unsure; provide high expectancy students with more time to respond to verbal questions; teach more difficult material to high expectancy students; and give high expectancy students more challenging class work and homework assignments.

### *Students' Perceptions of Differential Teacher Treatment*

Are students aware of expectancy-triggered differential treatment? And if so, do such perceptions play a role in the self-fulfilling prophecy process? Questions such as these have been addressed by a very unique program of research.

Given that differential treatment is the behavioral means (on the part of teachers) by which self-fulfilling prophecies occur, Brattesani, Weinstein, and Marshall (1984) hypothesized that self-fulfilling prophecies would be larger in classrooms where students perceived their teachers as providing more preferential treatment to high expectancy students. Accordingly, Brattesani et al. asked students to indicate how much their teachers treated different students differently. They then split the teachers into two groups: Those whose students identified them as engaging in much differential treatment, and those whose students identified them as engaging in little differential treatment. Analyses then assessed the extent to which teacher expectations predicted student self-expectations and their future achievement, after controlling for achievement the prior year.

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As predicted, teacher expectations most strongly predicted student expectations and achievement among classes in which the students perceived the greatest differential treatment. The effect sizes for teacher expectations predicting student expectations and achievement ranged from about 0 to .1 among the low differential treatment classes, and from about .3 to .4 among the high differential treatment classrooms.

Exactly what this means, however, is not completely clear, for two separate empirical reasons. First, a more recent study (Kuklinski & Weinstein, 2001) found that this pattern replicated in third grade, but not in first or fifth grade. Furthermore, both studies (Brattesani et al., 1984; Kuklinski & Weinstein, 2001) used relatively small sample sizes (see Table 17.1). Additional research is therefore needed before concluding that student perceptions of differential treatment are clear and consistent moderators of self-fulfilling prophecies.

In addition to the issue of replicability, the empirical status of student perceptions of differential treatment as a moderator versus epiphenomenon is unclear. One possibility is that the existing research can be taken at face value. In that case, student perception of differential treatment per se is indeed a moderator of self-fulfilling prophecy effects. This has an important implication: Student perceptions, *independent of actual teacher differential treatment*, moderate self-fulfilling prophecies. How such a process might actually work has never been articulated in the research on student perceptions of differential treatment.

Another possibility, however, is that student perceptions of differential treatment do not, by themselves, moderate self-fulfilling prophecies. Given that actual teacher differential treatment must occur in order to create a self-fulfilling prophecy, self-fulfilling prophecies, by definition, must be larger in classrooms with more actual differential treatment than in classrooms with no differential treatment (in which self-fulfilling prophecy effects would be zero). This should occur regardless of student perceptions. However, if students are not completely out of touch with the reality of teacher differential treatment, then their perceptions of differential treatment will correlate with actual differential treatment. Thus, student perceptions of differential treatment may appear to moderate self-fulfilling prophecies, even though they have no causal power to do so. Their apparent status as moderators could occur entirely because they are correlated with a necessary mediator of self-fulfilling prophecies—actual differential treatment.

Further complicating these issues is that much of the theorizing suggests that students' perceptions of differential treatment mediates rather than moderates self-fulfilling prophecies. The mediational model declares that differential treatment leads to perceptions of differential treatment which then influences students' self-expectancies, and these self-expectancies cause future achievement (e.g., Brattesani et al., 1984; Kuklinski & Weinstein, 2001; Weinstein, 1985). This implies a *mediating* (not moderating) role for student perceptions (the implicit model being something like: teacher expectations → differential treatment → perceptions of differential treatment → students' expectations → student achievement). The empirical research, however, has to date investigated student perceptions of differential treatment as moderators, not mediators, of self-fulfilling prophecies (Brattesani et al., 1984; Kuklinski & Weinstein, 2001). Greater clarity regarding the theoretical status of student perceptions of differential treatment as moderators versus mediators is clearly necessary to shed greater light on their causal role in achievement.

Regardless, research has found little or no evidence that student self-perceptions (of ability, self-expectations of performance, etc.) actually mediate self-fulfilling prophecies (e.g., Jussim, 1989; Kuklinski & Weinstein, 2001). This is because, in the context of models that include controls for prior achievement, standardized path coefficients relating self-perceptions to future achievement

are typically between 0 and .10 (Jussim, 1989; Kuklinski & Weinstein, 2001). Even at .10, this means that mediational effects of student self-perceptions and expectations account for, at most, 1/10 of the self-fulfilling effects of teacher expectations on student achievement (this is because the mediated effect equals the product of the path coefficient relating teacher expectations to self-perceptions and the path coefficient relating student self-perceptions to achievement). Current evidence, therefore, has yet to identify a context in which student perceptions of differential treatment substantially account for self-fulfilling prophecies through the hypothesized mediator of student self-perceptions.

### *Step 3: Differential Treatment Affects Students*

Given that teacher expectations create self-fulfilling prophecies and that teachers treat high expectancy students differently than they treat low expectancy students, expectancy-related differential treatment must somehow, therefore, be affecting students. Figuring out just how, however, has proven more difficult than it might have seemed. For example, the most obvious answer to how teacher expectations affect students (at least for many psychologists) was that it would affect students' motivation (e.g., Cooper, 1979; Cooper & Good, 1983; Eccles & Wigfield, 1985; Jussim, 1986; Weinstein, 1985). The motivational mediation idea is, at its core, quite simple: differential treatment affects student motivation which, in turn, affects student performance. To mediate self-fulfilling prophecies, this could mean that the treatment teachers accord high expectancy students generally increases motivation which improves their performance; and the treatment teachers accord low expectancy students generally undermines their motivation which harms their performance.

As simple as this core idea may be, and as common as it may be to theorizing about self-fulfilling prophecies (Cooper, 1979; Eccles & Wigfield, 1985; Jussim, 1986; Weinstein, 1985), it has proven difficult to demonstrate empirically. Although quite a few studies have examined effects of teacher expectations on a variety of student motivational variables (student self-expectancies, value placed on achievement, self-efficacy, etc.), none have ever shown that student motivation explains very much of the causal relationship between teacher expectations and student achievement (e.g., Brattesani et al., 1984; Cooper & Good, 1983; Jussim, 1989; Kuklinski & Weinstein, 2001). Effects on achievement of motivational variables assessed in such studies were often near zero, and rarely, if ever, exceeded .1 (in terms of standardized regression coefficients relating motivation to achievement, in the context of models that controlled for prior achievement and teacher expectations). Such effects, even when statistically significant, are just too small to account for very much of the relation between teacher expectations and student achievement.

Another, not mutually exclusive, route by which teacher treatment affects student achievement is by teacher expectations directly affecting student learning, independent of whatever effects they might have on motivation. Unfortunately, however, nor is there much evidence that teacher expectations create self-fulfilling prophecies because they directly cause students to learn more material, without mediation by student motivation. There is much evidence that teacher expectations influence student achievement, and that teachers treat high expectancy students differently than they treat low expectancy students. Exactly how that treatment translates into higher achievement, however, remains largely unknown.

There are only two broad categories of possible ways by which teacher treatment can affect students in such a manner as to result in self-fulfilling prophecies. It can affect their motivation, or it can affect something other than motivation. These two possibilities are mutually exclusive

and exhaustive. Thus, the existing research on psychological responses to teacher expectations ultimately manifests students' reactions to differential treatment rarely go beyond the question of how teacher expectations affect student achievement. It is not clear that many of the existing studies on teacher expectations and student achievement are necessarily spec-

### *Direct Effects of Differential Treatment*

Several of the types of differential treatment (e.g., Weinstein, 1985) four factor theory of self-efficacy theory) are thought to be directly influencing student achievement. For example, the material to high expectancy students is of differential treatment for example, to try to provide a more pre-calculus. Given the differential treatment may reflect individual student

We know, however, that the evidence is not accurate. Therefore, the material prepared for advanced students is a self-fulfilling prophecy. Johnny is given fewer opportunities to learn more material.

Rosenthal's (1972) study on teacher expectations and student achievement. The study found that the mastery of material by students is directly influenced by the treatment they receive. For example, high expectancy students are given more complex projects, while low expectancy students are given simpler projects. This differential treatment may have also directly increased student achievement on complex projects, when they are not given the opportunity to learn such material. For low expectancy students, the differential treatment may have also directly increased student achievement on complex projects, when they are not given the opportunity to learn such material.

Clear and frequent feedback is essential for learning. Feedback allows students to see their progress. In the context of differential treatment, it is difficult for students to receive clear and frequent feedback.

and exhaustive. This section addresses these possibilities in a largely speculative manner, because the existing research has yet to empirically identify the processes by which students' social and psychological responses to the types of differential treatment caused by teacher expectations ultimately manifest as self-fulfilling prophecies. In an attempt to identify some possible ways students' reactions to teacher treatment might mediate self-fulfilling prophecies, we must necessarily go beyond the traditional teacher expectation literature. We specifically review research on how teacher behavior and practices influence students' learning and motivation and we argue that many of those behaviors and practices map nicely on to what is known about teacher expectations and differential treatment. Absent direct empirical evidence, however, our review is necessarily speculative.

#### *Direct Effects of Differential Treatment on Learning*

Several of the types of differential treatment identified in Rosenthal's (1974; Harris & Rosenthal, 1985) four factor theory likely have direct effects on how much students learn, without necessarily influencing student motivation. For example, teachers often convey more and more difficult material to high expectancy students (the input factor from Rosenthal's theory). Often, this type of differential treatment will be appropriate and well-justified. It would be quite foolish indeed, for example, to try to teach calculus to a student who has not mastered algebra, whereas it is quite reasonable to teach calculus to a student who has mastered every math topic up through pre-calculus. Given the typically high accuracy of teacher expectations, many forms of differential treatment may reflect a well-justified attempt on the part of teachers to tailor their practices to individual students' needs.

We know, however, that self-fulfilling prophecies do occur, and that teachers are not always accurate. Therefore, when inaccurate, e.g., when a teacher erroneously believes Janie is more prepared for advanced work than is Johnny, this type of differential treatment may create a self-fulfilling prophecy. If Janie is given multiple opportunities to learn advanced material, whereas Johnny is given few or no such opportunities, by the end of the year, it is likely that Janie will have learned more material than did Johnny.

Rosenthal's (1974) output factor also may directly increase learning without influencing student motivation. The output factor refers to giving students opportunity to perform and demonstrate mastery of material. It includes everything from calling on students more frequently in class to allowing them to take on more difficult and challenging assignments. Although such differential treatment may have motivational effects (discussed later), independent of any such effects, it may also directly increase learning. When provided with an opportunity to work independently on complex projects, for example, students may learn more and more sophisticated material than when they are not given such opportunities. By giving students a chance to demonstrate mastery of a complex and partially independent project, teachers are creating opportunities for students to learn such material on their own. If teachers provide high expectancy students with more such opportunities, all other things being equal, again, they may simply learn more material than do low expectancy students who are not given such opportunities.

Clear and frequent feedback (Harris & Rosenthal, 1985; Rosenthal, 1974) also likely facilitates learning. Feedback provides useful information regarding how well one is learning a particular set of material or skills. Frequent and clear feedback, therefore, can be used by students to gauge their progress. In contrast, when such feedback is less frequently made available, it may be more difficult for students to determine how they stand with respect to the material. If students are not

aware that they do not understand material, it may often be difficult to realize that they still need to learn that material. Thus, clear feedback may make it much easier for students to learn.

### *Direct Effects on Learning May be Synergistic with Motivational Effects*

Direct effects of differential treatment on learning and achievement do not preclude the possibility that those effects also sustain or boost motivation. For example, after having succeeded at mastering difficult and complex material, students may more confidently take on difficult and challenging material in the future. Several lines of research are consistent with this. First, self-perceptions, self-efficacy, and expectations for one's own performance in an area are strongly affected by actual levels of accomplishment (Eccles & Wigfield, 1985). Second, students who were the beneficiaries of positive self-fulfilling prophecies in sixth grade math classes went on to take more advanced math classes in high school (Smith, Jussim & Eccles, 1999). Although this study did not examine motivational mediation, it raises the possibility that learning more early on leads to confidence that enhances students' willingness to tackle more difficult work at a later time. Thus, the direct effect of differential treatment (output) on learning may have further effects on motivation, which, in turn, influence future levels of achievement.

The effects of feedback on achievement may also be sustained, in part, through effects on motivation. Feedback can be used to regulate attention and effort. If one is succeeding at mastering the material, current levels of attention and effort are probably adequate. If not, increased attention and effort may be required. If such efforts prove successful, one has learned not only the material, but something about one's self—that one can achieve more highly by exerting greater effort. Consistent with this perspective, lack of clear performance feedback has been implicated in the underachievement of African American students (Crosby & Monin, 2007; Harber, 1998). Students (African American or not) who are not given clear information about where they stand with respect to mastering material are not given the chance to recognize and compensate for failures or difficulties in learning that material.

It seems likely, therefore, that some direct effects of differential treatment on learning also produce motivational effects, which, in turn, may further affect learning. In addition, differential treatment may not always directly affect learning. Instead, it may often affect motivation first, and it is only because of such motivational effects that differential treatment affects achievement. Such effects, therefore, are discussed next.

### *Motivational Mediation*

*Differential Treatment Revisited* Understanding how students react to differential treatment starts with understanding differential treatment. Unfortunately, however, ever since Harris and Rosenthal's (1985) meta-analysis on differential treatment effects, relatively little research has been conducted on the ways in which teachers act on their expectations. One possible reason for this is that the meta-analysis was so clear and conclusive that researchers assumed that most or all of the interesting questions about differential treatment had been answered. Another possible reason is that the field simply lost interest.

Teacher behavior and instructional practices certainly include climate, feedback, input, and output, as indicated by Harris and Rosenthal's (1985) meta-analysis. Their meta-analysis was focused specifically on assessing the extent to which the literature, up to that point, supported the four factor theory of differential treatment (Rosenthal, 1974). Because they were focused on testing

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the four factor theory, however, they did not consider other forms of differential treatment. That, of course, does not necessarily mean that other forms of differential treatment do not occur.

Teacher behavior and instructional practices vary in many ways beyond climate, feedback, input, and output. For example, teachers may provide students with tasks that vary in how repetitive, complex or engaging they are. Such variability in tasks does not readily map on to Harris and Rosenthal's four factor meta-analysis. In addition, teachers may provide high expectancy students more autonomy to choose their own tasks and projects. This, too, does not readily map onto Harris and Rosenthal's (1985) four factor meta-analysis.

What, then, might be some types of differential treatment that are consistent with but also go beyond the four factor theory? And, particularly, what types of differential treatment might both reflect teacher expectations and also influence student motivation? Although there is no hard, direct empirical evidence that bears on these questions, there have been many advances in research on teacher practices that affect student motivation since the heyday of teacher expectation research in the 1970s and 1980s. Although a thorough review of that research is beyond the scope of the present chapter, one particular set of advances—the TARGET framework—appears to us to point to some strong contenders for teacher practices that both reflect expectations and influence motivation. Those practices are discussed next.

*TARGET TARGET* (advanced by Blumenfeld, 1992; Epstein, 1988) was introduced as a way of organizing the kinds of teacher practices and behaviors that increase or undermine students' motivation in the classroom. As such, the research on TARGET might help fill in some of the gaps with respect to how student motivation might mediate the relationship between expectancy-related teacher treatment and student achievement in such a manner as to help understand and explain self-fulfilling prophecies.

TARGET organizes these teacher practices along six dimensions: task, autonomy, recognition, goal structure/grouping, evaluation, and time. According to research on TARGET, a teacher who utilizes such practices enhances students' motivation by fostering the establishment of adaptive motivational patterns (e.g., Ames & Archer, 1988). Next, therefore, is a brief description of what constitutes adaptive motivational patterns, followed by a description of the six TARGET dimensions that produce such patterns.

*Adaptive Motivational Patterns* Adaptive motivational patterns refer to thoughts, feelings, and behaviors that contribute to students' learning in the classroom. Although a complete review of research on adaptive motivational patterns is beyond the scope of this chapter, abundant evidence testifies to the relationship between adaptive motivational patterns and positive outcomes in school (e.g., Church, Elliot, & Gable, 2001; Elliot & McGregor, 2001; Elliott & Dweck, 1988; Harackiewicz & Elliot, 1993; Pintrich, Conley, & Kempler, 2003; Smiley & Dweck, 1994). Next, therefore, we briefly describe adaptive motivational patterns and provide some examples.

Adaptive motivational patterns manifest in positive cognitions, affect, and behavior. Positive cognitions typically refer to higher-level thought processes. Deep level study strategies, for example, are higher-level thought processes that help information get from the working memory into the long-term memory. One example of a deep level study strategy is elaborative rehearsal. This involves connecting new information to existing, well-learned information. The opposite of elaborative rehearsal is rote memorization, which is a surface level study strategy. Self-regulatory strategies are also positive cognitions (setting goals for learning, monitoring and evaluating progress, and self-reinforcing for achieving goals). In contrast, students who do not set their

own goals or monitor their own progress are not engaging in the type of positive cognitions that characterize adaptive motivational patterns.

Positive affect is also an important manifestation of adaptive motivational patterns. Examples of positive affect may include: (a) students who are excited by the prospect of learning and therefore seek out challenging academic situations to maximize learning and (b) students who feel confident about their ability to learn. These affects are viewed as part of an adaptive motivational pattern because they keep students engaged in school. The alternatives—students who are bored or disengaged and/or who lack confidence—are not likely to lead students to exert the type of effort necessary to maximize their achievement.

One reason positive cognitions and affects are so important is that they may lead to positive behaviors. Positive behaviors may include: (a) allowing more study time before an exam to learn the material on a deeper level, (b) taking in-depth notes during lectures, and (c) persisting at a task in the face of difficulty. Taken together, these three aspects of adaptive motivational patterns work in concert and can have reciprocal effects on each other and on motivation in general. For example, a student who focuses on improving test scores (adaptive thought) rather than earning the highest grade in the class (maladaptive thought) is more likely to spend more time to study for an exam (adaptive behavior) rather than cram the night before (maladaptive behavior), and will most likely feel more confident and excited by the prospect of learning (positive affect) rather than feeling stressed and overwhelmed (negative affect).

Teacher practices identified by TARGET may provide insights into how differential treatment alters student behavior in such a way as to produce self-fulfilling prophecies. The TARGET framework was created in order to characterize teacher practices that do, in fact, alter students' behavior in such a way as to sustain motivation to learn and increase achievement. Next, therefore, is a brief description of how each dimension of TARGET can produce adaptive motivational patterns.

*Task* The task dimension refers to the types of tasks that teachers assign their students. Tasks vary in a variety of ways that can affect student motivation (Ames, 1992; Blumenfeld, 1992). Tasks can differ in degree of difficulty and how they are structured or organized (essays, short answers, problem-solving, projects, etc.). They can also vary in how much students value them (see Eccles & Wigfield, 2002; Wigfield, Tonks, & Clauda, this volume, for more detailed discussions of the roles of values in motivation). According to TARGET, teachers should do their best to engage students in tasks that maximize how much those students value education and achievement.

Tasks can influence motivation in a variety of ways because students use information that is "...embedded in tasks...to make judgments about their ability, their willingness to apply effortful strategies, and their feelings of satisfaction" (Ames, 1992, p. 263). When tasks are varied, challenging, and applicable to real-world situations, they tend to foster sustained interest in and commitment to learning (Deemer, 2004). When tasks are repetitive and easy, students readily lose interest and commitment. Tasks that are too difficult, however, will likely evoke frustration and, if too frequently encountered, may be demotivating (Peterson, Maier, & Seligman, 1993).

*Authority/Autonomy* Autonomy refers to the degree of control students have in their classroom. Teachers who support autonomy in the classroom, as opposed to being controlling, tend to (a) offer choices to students with regard to tasks and other classroom activities, and (b) ... "allow students to have a say in establishing priorities in task completion, method of learning, or pace of learning..." (Ames, 1992, p. 266). Because of these teacher practices, students are more likely to feel like valued members of the classroom community whose opinions matter, and to remain

psychologically engaged (Ames, 1992; Deemer, 2004). Tasks that are too difficult, however, will likely evoke frustration and, if too frequently encountered, may be demotivating for them to become engaged.

*Recognition* Recognition refers to the type of feedback and behavior in the classroom that leads to high performance. Although students may be motivated by praise, it is important for those part of the class who are struggling to feel badly not to be singled out. Furthermore, failing to provide feedback to students to engage them in learning is crucial for maximizing their achievement. The importance of teacher recognition for maximizing student success as the

*Grouping* The way in which students are grouped can have a significant impact on their motivation to learn. The use of grouping, for example, can be used to achieve a goal, while individual work (Ames, 1991). Success, in addition to motivation, as well as a share of responsibility, and teachers utilize a variety of social skills and more complex tasks to lead to boredom.

*Evaluation* The way in which students are evaluated can have a significant impact on their motivation to learn. Evaluation that focus more on the process of learning rather than the product of learning can lead to a sense of accomplishment and a sense of achievement. Such evaluation can be demotivating. Such evaluation can provide little information (Deemer, 2004).

*Time* The amount of time spent on a task can have a significant impact on student motivation. Although more time spent on a task can lead to a sense of accomplishment, it can also lead to boredom.

psychologically engaged in and committed to classroom activities (Ames, 1992; Blumenfeld, 1992; Deemer, 2004). When teachers fail to provide students with autonomy, it can be seriously demotivating for students. Under such circumstances, students may do what they are told, but when they engage in school activities entirely because they are under duress, there is less reason for them to become psychologically engaged in or committed to classroom activities.

*Recognition* Recognition refers to acknowledging and praising students for their effort, progress, and behavior in the classroom. The recognition factor in TARGET does not emphasize high performance. Although praising or publicly acknowledging high achieving students may be rewarding for those particular students, it may actually lead many other students in the same classroom to feel badly not just about their performance, but about education in general (Deemer, 2004). Furthermore, failing to recognize effort, progress, and constructive behaviors fails to encourage students to engage in those behaviors most likely to enhance their learning and achievement. In contrast, by praising students for effort, teachers encourage students to engage in a behavior that is crucial for maximizing their learning and achievement. In general, TARGET emphasizes the importance of teachers recognizing students for the behaviors that lead them to be as academically successful as they can be, rather than for meeting an external standard of success.

*Grouping* The ways in which teachers group their students for in-class activities (and whether they use grouping at all) can influence students' interest and engagement in an activity. In cooperative grouping, for example, students work together in face to face interactions to accomplish a shared goal, while individuals are still held accountable for their performance (e.g., Johnson & Johnson, 1991). Success, in particular, is determined by a focus on improvement rather than competition, as well as a shared responsibility and excitement for learning (Maehr & Anderman, 1993). When teachers utilize cooperative grouping, it provides opportunities for students to (a) enhance their social skills and social negotiation, (b) foster interdependence among one another, and (c) use more complex thinking strategies (Deemer, 2004). When teachers use no grouping at all, it may lead to boredom, lack of creativity, and isolation.

*Evaluation* The ways in which teachers evaluate their students' work is critical for the establishment of adaptive motivational patterns. Such patterns are most strongly sustained by evaluations that focus more on students' self-improvement and achievement of objective standards. Regardless of their rate of learning, or standing compared to other students, knowing that one has mastered a skill, technique, or a content domain that one previously had not mastered provides both a sense of accomplishment and feedback regarding one's progress. In contrast, evaluations that focus on social comparisons, which, unfortunately, is common practice in many classrooms, can be demotivating. For example, grading on a curve focuses quite explicitly on social comparisons. Such evaluations only inform students how their performance compares to other students. They provide little information about the extent to which students have mastered the required material (Deemer, 2004).

*Time* The amount of time teachers give their students to learn is critical to their success and motivation. Although unlimited time is not available (due to curriculum demands, for example), the more time they give students to learn, the better the chance students have to master the material. Furthermore, the more often topics are revisited in the classroom and the more flexible

teachers are with time for learning, the more likely students are to master the material (Maehr & Anderman, 1993).

*How TARGET Complements Existing Research on Differential Treatment* The TARGET framework strongly suggests that certain specific teacher behaviors increase or decrease students' motivation. The behaviors previously identified as characterizing teacher treatment of high expectancy students (e.g., Harris & Rosenthal, 1985)—warmer climate, more feedback and more positive feedback, more teacher input, and more student opportunities for output—are all consistent with the TARGET framework. Nonetheless, the TARGET framework provides more specificity than most prior work on teacher treatment models of self-fulfilling prophecies.

For example, the positive interactions and teacher recognition factors of TARGET directly map onto the warmer climate and feedback factors in teacher expectation/differential treatment models. On the other hand, providing more meaningful and interesting tasks and greater autonomy (all identified by TARGET) also probably contribute to the warmer climate that teachers provide high expectancy students, but have not been specifically identified in prior work on self-fulfilling prophecies. Nonetheless, such practices are plausibly involved in differential treatment. Rote and repetitive tasks are often seen as necessary requirements for students performing below certain standards and teachers may be more likely to provide more freedom and autonomy to their high expectancy students. Undoubtedly, some aspects of such types of differential treatment may be appropriate for certain students under certain circumstances. Nonetheless, both TARGET and research on teacher expectations strongly suggests that, sometimes, teachers may provide too large a difference in autonomy and meaningful tasks to their high and low expectancy students (later in this chapter, we discuss the likely motivational effects of such differences).

A greater frequency of evaluations, especially positive ones involving recognition with a focus on improvement (as identified by TARGET), also fit the feedback dimension of the 4-factor theory of teacher treatment. The type of tasks and in-class groupings identified by TARGET correspond well with the input and output factors that are well-established in the research on expectancy-related differential treatment. Overall, therefore, the insights provided by TARGET with respect to improving student motivation are highly compatible with what is already known about the types of teacher behaviors that most heavily mediate self-fulfilling prophecies.

*How TARGET Extends Beyond Existing Research on Differential Treatment* The TARGET framework, however, does more than merely match up well with what is already known. It also provides additional, and more specific, guidance regarding ways in which teachers are likely to treat high expectancy students differently than low expectancy students—ways not well-recognized by existing theory or empirical research—and how such treatment might alter student motivation in such a way as to alter student achievement (and thus produce a self-fulfilling prophecy).

TARGET raises the possibility that self-fulfilling prophecies may occur, in part, because teachers evoke greater effort from their high expectancy students than from their low expectancy students. The hypothesis that teachers evoke greater effort from their high expectancy students, and may discourage effort among low expectancy students, has, as far as we know, never been directly tested. In business contexts, however, inspirational leaders often evoke extraordinary efforts from their followers, and such efforts are often a major part of what has made certain corporations extremely successful over the long term (Collins & Porras, 1997). Thus, the hypothesis that teachers evoke greater effort from their high expectancy students clearly warrants testing.

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Another way in which TARGET extends beyond the four-factor theory is by suggesting that ability grouping practices might moderate self-fulfilling prophecies. Specifically, TARGET suggests that within class, same-ability grouping (e.g., having the high performing students work together and the low performing students work together) may undermine students' motivation. This may have little effect on the high expectancy students who typically will already be high achievers with high motivation. It is too easy, however, for such situations to undermine the motivation of the students in the low groups. If students realize they are in "low" groups, their own efficacy and performance expectations may decline, thereby undermining their achievement (Eccles & Wigfield, 1985; Steele, 1992). Among such students, therefore, teachers' expectations are likely to make the biggest difference.

For example, school tracking refers to the policy of segregating students into different classes according to their ability; that is, smart students may be assigned to one class, average students to another, and slow students to a third. Because tracking represents institutional justification for believing that some students are more able than others, some researchers have suggested that tracking may lead to the type of rigid teacher expectations that are most likely to evoke self-fulfilling prophecies (Oakes, 1986).

The one study to empirically investigate this hypothesis, however, failed to support it (Smith et al., 1998). Self-fulfilling prophecies among students grouped by ability between classes were no more powerful than those among students in heterogeneous classes—and both fell within the typically small range of 0–.2 (the results varied slightly by predictor and outcome, but not by between class groups).

There was, however, some evidence that *within class* grouping moderated self-fulfilling effects of teacher expectations (within class grouping refers to the practice of dividing students into two or more ability groups within a class). Although effects were near zero among students who were either not grouped at all, or who were in high groups, such effects were about .2 among those in low ability within class groups. Ability differences and group labels may be more salient to teachers who use within-class grouping. Students in low groups (within classes) are more vulnerable to confirming teachers' expectations. This is not necessarily bad. By adopting TARGET-like practices that involve encouraging and challenging low achieving students, teachers may disproportionately produce beneficial self-fulfilling prophecies. "I know that if you work at this, you can master this material" is likely to be particularly powerful among such students. When teachers communicate very low expectations for students in this group, it is likely to strengthen and reinforce the message of "you can't really do this."

Another way that TARGET contributes new insights into how teacher treatment alters student behavior includes the time they spend in the classroom, and the way in which they use that time. Teachers may sometimes just spend more time teaching, working with, assisting, and challenging high expectancy students. A simple tally of time spent with individual students might not capture this, to the extent that teachers also spend a fair amount of low quality time (disciplining, reprimanding, etc.) with low expectancy students. Indeed, such time is likely to be demotivating. Instead, time spent on engaging and challenging topics (especially individual or small group time) is likely to encourage students to engage in adaptive motivational patterns. Little research has addressed the role of teachers spending different amounts of high quality intellectually challenging time, per se, with different students in creating self-fulfilling prophecies, although one observational study did find that teachers spent almost all of their time and attention teaching high expectancy students (Rist, 1970). This, too, was only a single study, and whether a similar pattern holds more generally is largely unknown.

Overall, TARGET contributes valuable information regarding additional ways in which teacher treatment likely alters student motivation and behavior. To what extent are such processes likely to mediate self-fulfilling prophecies? Unfortunately, there currently is no data that bears directly on this question. Thus, our analysis of the role of TARGET-like practices and student motivation in mediating self-fulfilling prophecies should be viewed more as hypothesis-generating ideas than as established empirical facts. The next section, therefore, considers the conditions under which such processes are more versus less likely to mediate self-fulfilling prophecies.

### **When Student Motivational Mediation Is Merely A Partial Explanation For A Modest Effect**

Self-fulfilling prophecy effects, especially in real classes, are often not very large, averaging about .1–.2. And, undoubtedly, self-fulfilling prophecies do not occur exclusively because teachers raise or lower student motivation. So, this raises a “why bother” specter. Why bother trying to understand the role of student motivation in mediating the self-fulfilling effects of teacher expectations, if they merely constitute a partial explanation for a modest effect?

This is not an unreasonable or even cynical question. In fact, considering it seriously provides some important insights into what future research is and is not likely to find. Student motivation is a multi-faceted, multi-dimensional construct. There are many different aspects and types of motivation. Each one will likely provide only a partial contribution to the (itself) partial contribution that “student motivation” makes to the average modest self-fulfilling effect.

To get concrete, let us say that, in some context, self-fulfilling prophecies have an effect size of .20. Let us further say half of that is motivationally mediated. That means .10 of the effect of teacher expectations on student achievement comes via student motivation. If self-efficacy mediates part of that, and adaptive motivational patterns another part, and self-perceptions of ability another part, etc., each may only mediate a tiny fraction of a self-fulfilling prophecy—.02 here, .04 there. Such effects may be so small, that they may be difficult to detect with traditional analytic methods such as regression, ANOVA, or HLM. And failure to find “significant” evidence of motivational mediation may lead researchers to the pessimistic conclusion that motivation does not matter.

### **When Student Motivational Mediation May Be a Powerful Explanation for a Large Effect**

A pessimistic conclusion that student motivational mediation of self-fulfilling prophecies does not matter would be at minimum premature, and most likely very wrong, at least in some very important circumstances. This section, therefore, discusses the contexts in which student motivation is likely to be a powerful mediator of a powerful expectancy effect.

The term “underachiever” is often used to refer to low performing students in much the same manner as “differently abled” is used to refer to people with handicaps. That is, it may often be a politically correct or diplomatic way to refer to students about whom one has very low expectations because their prior histories have demonstrated very low achievement. Nonetheless, there are theoretical, scientific, and real world reasons to think the term “underachiever” may have more than a grain of truth in it. That is, many low achieving students may be capable of achieving at much higher levels under the right conditions, and one of those conditions involves teacher expectations.

Abundant evidence suggests that school is often an unfriendly place for many African American and lower SES students (e.g., Condrón & Roscigno, 2003; Lareau, 1987; Steele, 1992). When school

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is consistently a difficult place, students may often “disidentify” with achievement by devaluing the importance they place on school or by devaluing the particular subjects in which they feel devalued (e.g., Eccles & Wigfield, 1985; Jussim, 1986; Steele, 1992; Verkuyten & Thijs, 2004). Is this itself a self-fulfilling prophecy? Perhaps sometimes, but certainly not always. School can be difficult for students from stigmatized backgrounds for all sorts of reasons, many of which have nothing to do with teacher expectations. Poverty, one-parent or no-parent homes, cultural differences and many other factors probably contribute to the difficulties such children have in school. On the other hand, to the extent that teachers and administrators come to believe such students *cannot* do better, such beliefs probably do constitute self-fulfilling prophecies to the extent that they function to *prevent* students from doing better.

Regardless of the reasons for low achievement, however, disidentification and psychologically distancing one’s self from school, in addition to undermining achievement, probably renders many such students more readily influenced by teacher expectations in several ways. When students with a history of negative school experiences find themselves faced with a supportive, encouraging teacher who also insists on high performance, it may feel like a breath of fresh air. Such a teacher may inspire some previously low achievers to engage in the efforts necessary to raise their achievement levels.

This perspective may not be as Pollyannaish as it sounds. In his influential article on Black disidentification with school, Steele (1992) describes academic programs in which previously low performing students (e.g., some with SATs in the 300s) take on difficult honors-level work and come to outperform their White and Asian classmates. Steele’s (1992) description of these programs implies that the teachers often engage in behaviors much like those specified by TARGET and that lead to beneficial self-fulfilling prophecies in the classroom and workplace: They are challenging and supportive (e.g., Brophy & Good, 1974; Cooper, 1979; Eccles & Wigfield, 1985; Eden, 1984, 1986; Harris & Rosenthal, 1985; Jussim, 1986; Rosenthal, 1989; Wentzel, 1997). In addition, anecdotal evidence shows that charter schools serving impoverished ethnic minority communities in Boston and New York can dramatically improve student achievement, in large part, by holding students to high standards (high expectations) and by requiring and inspiring students to exert extraordinary levels of effort (*Boston Globe*, 2004; Sangree, 2000; Uncommon Schools, 2008).

In short, students suffering from some sort of stigma, whether demographic (race, class) or personal (handicap, disability, low achievement), may be particularly susceptible to self-fulfilling prophecies. However, because disproportionate numbers of such students often perform poorly, the main direction of their vulnerability to expectancy effects is up, not down. For students on a trajectory to drop out of high school, or even barely get by, there is far more potential to move up the academic achievement ladder than to move down. For a high achieving student, because there is less room to move up, an equally high teacher expectation has less potential to create a beneficial self-fulfilling prophecy.

Thus, positive teacher expectations are likely to have a disproportionately high effect on low achieving and stigmatized students. This perspective is entirely consistent with the research reviewed in the first major section of this chapter on the conditions under which powerful self-fulfilling prophecies occur. That section reviewed research showing that some of the largest self-fulfilling prophecies in the classroom ever obtained have been found among students from lower SES and low achieving backgrounds, and among students who are African American (Jussim et al., 1996; Madon et al., 1997).

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Furthermore, there is also ample reason to believe that those self-fulfilling prophecies disproportionately increased students' achievement. Research based on the same data also found that teacher expectations that were erroneously high produced larger self-fulfilling prophecies (effect sizes of about .4) than did teacher expectations that were erroneously low (effect sizes of .1-.2), and that this difference between the power of positive and negative self-fulfilling prophecies was greater among low achieving than among high achieving students (Madon et al., 1997). Under the wrong conditions, negative teacher expectations can undoubtedly harm students; however, Madon et al's (1997) results are broadly consistent with the conclusion that underachieving students may be (fortunately) particularly susceptible to positive self-fulfilling prophecies.

### Conclusion

This chapter had two major goals. First, we took stock of the existing research on teacher expectations and self-fulfilling prophecies in order to provide a clearer picture regarding the power and prevalence of such effects, and the conditions that affect them. That review concluded that the actual findings of the original Rosenthal and Jacobson (1968) were quite modest and corresponded well with the similarly modest results of subsequent research. Nonetheless, self-fulfilling prophecies are not always so modest. Self-fulfilling prophecies are consistently larger than usual when people enter new situations (e.g., first and seventh grade; the military), among underachieving students, and among students who are African American or from lower socioeconomic backgrounds.

That review also highlighted two areas of divergence between narrative reviews and the empirical literature. Although many narrative reviews seem to emphasize the role of self-fulfilling prophecies in harming students, the evidence on whether self-fulfilling prophecies are primarily harmful or beneficial is mixed. Furthermore, although many narrative reviews emphasize the power of self-fulfilling prophecies to accumulate over time, the evidence shows that self-fulfilling prophecies in the classroom dissipate.

The second part of this chapter focused on self-fulfilling prophecy processes. It reviewed the well-established literature on how teachers act on their expectations, and then highlighted a major limitation to existing knowledge about how self-fulfilling prophecies occur. That is, little or no research has clearly demonstrated how differential teacher treatment of high and low expectancy students actually affects those students in such a manner as to ultimately produce changes in achievement consistent with a self-fulfilling prophecy.

Absent data, our review of the processes by which teacher treatment translates into expectancy-confirming achievement was necessarily indirect and speculative. On purely analytical grounds, we suggested that there are two potential routes by which this could occur. Teacher treatment could directly affect how much students learn, thereby altering their achievement; or, teacher treatment could alter student motivation, which, in turn, could affect their performance. Our review further pointed out that student motivation is often *not* likely to be a powerful mediator of self-fulfilling prophecies, in large part, because self-fulfilling prophecies themselves are often not a very powerful phenomenon. Nonetheless, the scientific research demonstrating that students from stigmatized backgrounds are more vulnerable to self-fulfilling prophecies suggests that, sometimes, student motivation may be a very powerful mediator of positive self-fulfilling prophecies.

Perhaps even more important, one of the primary potential benefits produced by the research on teacher expectations is that the potential power of self-fulfilling prophecies can be harnessed by knowledgeable administrators and teachers to help enhance the achievement of the students who need it the most (see also Eden, 1984, 1986). High expectations are not, by themselves, a solution

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for underachievement. However, when coupled with an understanding of the teaching practices well-established at enhancing student motivation, commitment, and involvement in school, high expectations can be one powerful tool for redressing some educational inequalities.

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