

Covert Communication in Laboratories, Classrooms, and the Truly Real World

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Abstract

Hundreds of research studies have demonstrated that one person's expectations for the behavior of another person can actually affect that other person's behavior. These studies implicate the operation of processes of covert communication, communication that is subtle, largely nonverbal, and ordinarily unintended. The earliest studies of these processes showed that through their expectations, laboratory researchers unwittingly affected the responses of their research participants. Later studies showed that teachers' experimentally induced expectations about their pupils affected the pupils' intellectual performance. Most recently, studies of covert communication processes have extended to diverse contexts, such as the judicial and health care systems. For example, research indicates that judges' beliefs about the guilt of trial defendants can be unwittingly communicated to juries by the judges' nonverbal behavior during jury instruction. In addition, studies of covert communication in medical contexts show that physicians' effectiveness in persuading their patients to enter into treatment can be predicted from their tone of voice in talking to or about their patients. For example, one study showed that surgeons who used a bossy tone of voice when talking to their patients were more likely to be sued by their patients than were surgeons who used

a more respectful tone. In sum, then, we have learned a great deal about the importance of subtle processes of nonverbal communication, but a great deal more is yet to be learned about these processes as they occur in the relatively sheltered context of laboratories and classrooms and in the rough-and-tumble of the truly real world beyond.

Keywords

nonverbal communication; interpersonal expectations; mediating mechanisms; laboratory research; field research

For more than 40 years, I have been interested in processes of covert communication, that is, communication that is subtle, largely nonverbal, and ordinarily unintended. My interest began when I feared that I had nearly ruined the results of my 1956 doctoral dissertation because I probably had treated research participants differently depending on their experimental condition. I realized that my expectation or prediction for participants' performance might have become a self-fulfilling prophecy. To learn whether these suspected effects of experimenter expectancy might be produced experimentally, my students and I conducted a long series of studies in which we randomly assigned different expectations for research results to different experimenters. Employing graduate students and advanced undergraduate students as experimenters, we found that re-

search participants tended to respond as their experimenters had been led to expect. The fact that all experimenters had been given the same instructions to read to their research participants implicated covert processes of communication and influence as likely mechanisms by which experimenters' expectations led to changes in participants' performance (Rosenthal, 1994, 2002).

BEYOND THE LABORATORY

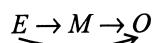
After a long series of studies had shown that experimenters' expectancies affected the performance of both human and animal subjects, we began to investigate how experimentally manipulating teachers' expectancies might affect the intellectual performance of their students. This research came to be known as Pygmalion studies, after the king of Cyprus who brought to life the statue he had sculpted (Rosenthal & Jacobson, 1992). Our own studies and those of other researchers showed clearly that teachers' experimentally created expectancies for the improved intellectual performance of their students actually brought about those improvements.

Meta-analyses (i.e., statistical analyses combining results of separate studies) in a number of research domains (e.g., studies of human and animal learning, of reaction time, and of the perception of inkblots, carried out in many different laboratories) showed that the phenomenon of interpersonal expectancy effects in laboratories and in classrooms was quite replicable; recent work indicates that the average effect size correlation (r) is about .30 (Rosenthal, 2002; Rosenthal & Rubin, 1978). An average effect size r of that magnitude would be sufficient to improve a 35% success rate in predict-

ing subjects' response to a 65% success rate (Rosenthal, 2002).

Mediating Variables

As we learned more about the occurrence and generality of interpersonal expectancy effects, we also began to learn more about the processes of communication that probably mediate, or "transmit," the effect. The following diagram illustrates the links among the three variables involved: the experimentally induced expectancy for the behavior of another person, *E*; the communication (mediating) variables, *M*; and the responses of the person for whom the expectations were held (outcome), *O*.



The *E-O* link describes the experimental effect of *E* on *O*. The *E-M* link describes the experimental effect of *E* on *M*. The *M-O* link describes the relationship between the mediating variable and the outcome variable. The *E-O* and *E-M* arrows are causal links because *E* is experimentally induced in research on interpersonal expectancy effects. One cannot conclude, however, that the *M-O* link is a causal link because *M* is not usually experimentally manipulated. I return to this important, but often overlooked, point later.

Four Factors

On the basis of the first 30 or so published studies relevant to mediation of teacher expectancy effects, we proposed a four-factor theory explaining how teachers' expectations affect students' performance (Rosenthal, 1994). We hypothesized that four major categories of teacher behaviors are involved. The first factor, *climate*, refers to the warmer socioemotional climate that teachers tend to create for students for whom they have ex-

pectations; this warmth can be communicated both verbally and nonverbally. The *input* factor refers to the tendency for teachers to teach more material to their "special" students. The *output* factor refers to the tendency for teachers to call on these students more often for answers. Finally, the *feedback* factor refers to the tendency for teachers to give more differentiated feedback to these students. By differentiated, we mean that the feedback is contingent on the correctness or incorrectness of the student's response and that the content of the feedback is directly related to what the student has said. Teachers have a tendency to accept subpar answers from students who they believe are less able.

Harris and I conducted meta-analyses that were designed to summarize the many studies that had examined the *E-M* or *M-O* link (or both) and to quantitatively estimate the importance of each of the four factors in the mediation of interpersonal expectancy effects (Harris & Rosenthal, 1986). These quantitative estimates were in the form of average effect size *r*s and were computed for both the *E-M* and the *M-O* links for each of the four factors. All eight estimates were statistically significant, indicating that teachers' expectancies are related to the four proposed mediating factors, and that the factors in turn are related to students' performance. Moreover, the strengths of the *E-M* links tended to correlate highly ($r = .88$) with the strengths of the *M-O* links. That is, the greater the *E-M* effect size was for a factor, the greater the *M-O* effect size was for that factor.

The average magnitudes of the correlations for the climate and input factors were especially impressive; they showed a typical effect size *r* of .28. An effect size *r* of that magnitude would be sufficient to increase the rate of correct predic-

tion of subjects' response from 36% to 64% (Rosenthal, 2002). These results indicate that, to a considerable degree, teachers teach more and teach it more warmly to students for whom they have more favorable expectations. The typical effect size correlation for the output and feedback factors was .14, which was smaller than that for climate and input, but also nontrivial. An effect size of this magnitude would be sufficient to increase the rate of correct prediction from 43% to 57% (Rosenthal, 2002). This finding shows that teachers do tend to give greater opportunities for responding and more differentiated feedback to students for whom they have more favorable expectations.

THE TRULY REAL WORLD BEYOND CLASSROOMS AND LABORATORIES

The covert communication that mediates one person's expectation for the behavior of another occurs well beyond the confines of the classroom or the laboratory. A recent meta-analysis of 13 Pygmalion studies conducted in work organizations found an average overall effect size *r* of .38 (Kierein & Gold, 2000); a mean effect size *r* of that magnitude would be sufficient to improve a success rate of prediction from 31% to 69% (Rosenthal, 2002). Kierein and Gold found larger effects of interpersonal expectations when the workers they were studying had low rather than high initial levels of performance. They also found larger effects when the experiments were conducted in military rather than in business settings. (For a more complete discussion of Pygmalion studies in management contexts, see Eden, 1990.)

In several studies, researchers have investigated how judges' be-

liefs about the guilt of the defendant affect their instructions to jurors (i.e., the *E-M* link described earlier) and how these instructions influence jurors' decisions about the defendant's guilt (i.e., the *M-O* link described earlier; see Blanck, Rosenthal, Hart, & Bernieri, 1990; Halverson, Hallahan, Hart, & Rosenthal, 1997). In a meta-analysis of the four studies reported to date, the median effect size r was .14, which was statistically very significant. This median effect size would be sufficient to increase the rate of findings of guilty from 43% to 57% for a jury instructed by a judge who believes a defendant to be guilty. Note that these studies controlled for the actual guilt and nonguilt of the defendant because the defendant the judge believed to be guilty (or not guilty) was not the same defendant whose case the jurors were trying to decide. That is, jurors saw a videotaped trial with defendant A but were given videotaped instructions from a judge who was actually instructing a different jury with a different defendant, B.

A few randomized experiments have investigated the influence of health care workers' expectations on the health outcomes of their patients. One such study, conducted in a nursing home, showed that raising caretakers' expectations for residents' health outcomes led to a reduction in the depression levels of the residents (Learman, Avorn, Everitt, & Rosenthal, 1990).

OTHER THIN SLICES

Not all of the research on covert communication that I have conducted with co-workers has focused on its role in the mediation of interpersonal expectancy effects. We have also investigated the link between covert communication and outcomes more generally.

For example, some of our most recent work on what we call thin slices of nonverbal behavior (i.e., audio or video clips lasting less than a minute) has dealt with the tone of voice that primary-care physicians and surgeons employ when talking with their patients (tone of voice is measured after sound filters remove the content from the speech samples). Comparing clinicians who had never been sued with those who had been sued at least twice, we found that surgeons who used a bossier tone of voice and primary-care physicians who seemed to care less about their patients (judging from their tone of voice) were more likely to be sued than were their less bossy and more caring counterparts (Ambady et al., 2002). In another study, we found that physicians' tone of voice in talking about patients was an accurate indication of their success rate in getting alcoholic patients to enter treatment (Milmoie, Rosenthal, Blane, Chafetz, & Wolf, 1967). Of special interest to teachers who are evaluated by their students at the end of the term is the research showing just how easy it is to predict an instructor's overall evaluation. All it takes is showing 30 s of a videotape of the instructor's teaching behavior, with the sound turned off, to students who are asked to rate the nonverbal behavior. Ratings of nonverbal qualities such as warmth, enthusiasm, and likeability have been shown to predict subsequent overall effectiveness ratings by both college students ($r = .76$) and high school students ($r = .68$; Ambady & Rosenthal, 1993). In further studies, when the 30 s of silent videotape was reduced to 6 s, predictive accuracy decreased but remained remarkably high ($r = .71$ for college teachers, $r = .31$ for high school teachers).

The results of these studies are not aberrant. In a meta-analysis of

38 independent studies of thin slices of behavior (5 min or less), we found considerable accuracy of predictions of various objective social and clinical outcomes (e.g., the effectiveness of teachers, physicians, and psychotherapists; the detection of dishonesty, anxiety, and depression), with an overall average effect size r of about .40 (Ambady & Rosenthal, 1992). Perhaps most surprising to us was that accuracy did not increase as exposure time was increased from 30 s to 5 min. Accuracy also did not increase in a series of studies based on thick slices of behavior that covered spans of hours and even days (Ambady & Rosenthal, 1992). These results suggest that although first impressions often turn out to be wrong, they are correct much more often than we might have predicted.

MEDIATING VARIABLES AND CAUSAL INFERENCE

In the previous sections, I have reviewed some processes of covert communication in laboratories and classrooms, and in the clinics, courtrooms, and corporations of the real world. My primary emphasis has been on processes in which the expectation of one person (e.g., an experimenter, a teacher, a health care provider, a judge, or an executive) for the behavior of another person (e.g., a research participant, a pupil, a patient, a juror, or an employee) comes to serve as a self-fulfilling prophecy. That is, the behavior expected actually comes to pass *because* the person expecting it expected it.

One can draw this causal conclusion about the *E-O* link on the basis of the results of hundreds of randomized experiments that have been conducted, reported, and summarized quantitatively. One can also draw a causal conclusion

about the *E-M* link because of the dozens of randomized experiments showing the effects of experimentally induced expectations on the mediating behavior of the person given the expectation. However, one *cannot* draw a causal conclusion about the *M-O* link. Although the relationships between mediating variables (e.g., the four factors involved in teaching) and outcome variables (e.g., student performance) are well established, it is not possible to say that these are causal links because the mediators have rarely been manipulated experimentally. For example, it may be that experimentally manipulated teacher expectations (*E*) cause both greater teacher warmth (*M*) and better student intellectual performance (*O*), and that these causal links are the reason why greater teacher warmth is associated with better student intellectual performance. Although it is tempting to conclude that the expectancy-caused warmth causes the improved outcome, this conclusion is not justified by existing data. To test for an *M-O* causal link, researchers must manipulate teacher warmth directly.

CONCLUSIONS

Over the past 40 years, researchers have learned a good deal about some processes of covert communication in classrooms, clinics, and courtrooms, and in the cubicles of corporations and of laboratories. However, for all that has been learned, there is much more that remains to be determined. For example, given that there is a correlation between students' performance and how warmly their

teachers treat them, it might seem straightforward that schools of education should apply this knowledge and train teachers to treat students more warmly, so that student performance will improve. This seemingly simple approach would be premature, however, until experimental studies have determined whether it is in fact possible to train teachers to treat their students more warmly, and whether teachers trained to be warmer would in fact elicit better performance from their students.

Similarly, it would not be wise to try to teach courtroom judges to be less biased in their nonverbal cues during their instructions to juries or to teach surgeons to be less bossy in talking to their patients before experimental research has shown (a) the degree to which it is, in fact, possible to teach these things and (b) the degree to which such behavioral changes actually bring about less biased jury verdicts and fewer lawsuits. In short, as is always the case in the sciences, new research shows how much more there is yet to learn.

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Note

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