

THE REAL “HAWTHORNE EFFECT”

Augustine Brannigan and William Zwerman

A defining characteristic of classic contributions to the social sciences is that they reward a close reading, even years after their initial publication. Frequently, they have lessons for later readers that were missed or overlooked when the work first emerged. The Hawthorne Studies have enjoyed a reputation—good and bad—over the decades since they were published, but in our view they contained some insights into the dynamics of worker perceptions that may illuminate some of the otherwise most perplexing expressions of workplace violence which have become more common in recent years. What happened at Hawthorne and what relevance might it have for us today?

The Hawthorne Studies were the single most important investigation of the human dimensions of industrial relations in the early 20th century. They were undertaken at the Bell Telephone Western Electric manufacturing plant in Chicago beginning in 1924 and continued through the early years of the Depression. The Hawthorne plant manufactured a variety of electrical equipment and its growth reflected the burgeoning home telephone market that developed in the 1920s. It employed 29,000 in 1927, but this number continued to grow until the early years of the Depression. As this kind of growth in highly specialized technological jobs was unprecedented in industrial societies, the effective management of worker skills required similarly unprecedented knowledge. The Hawthorne plant had created an Industrial Research Division in the early '20s. Personnel managers undertook a series of experiments to explore the effects of various conditions of work on morale and productivity.

In 1928, they consulted several external experts including Elton Mayo of the Harvard Business School, and Clair Turner, a professor of biology and public health at the Massachusetts Institute of Technology,

to help interpret the results of the studies. Their classic reports are Elton Mayo's *The Human Problems of an Industrial Civilization* (1933) and Fritz J. Roethlisberger and W. J. Dickson's *Management and the Worker* (1939). Roethlisberger was a student of Mayo's at Harvard, and the Roethlisberger-Dickson account is the authoritative one. It appeared a decade and a half after the start of the studies, and was almost suppressed by senior executives at Hawthorne who were alarmed by the claims that management in the bank wiring shop was virtually incapable of controlling worker output let alone assessing appropriate levels of productivity.

The Illusion of Familiarity

In his preface to *Management and the Worker*, Mayo alludes to the fact that there was some misunderstanding associated with the findings at Hawthorne. He states that prior reports had created “an illusion of familiarity when the Hawthorne experiment is mentioned.” He wrote: “but this is illusion: many of us have long been aware that there is no sufficiently general understanding of the course that the inquiry ran, of the many difficulties it encountered, and of the constant need to revise and renew the attack on the diverse problems presented” (Mayo, 1939: xi). *Management and the Worker* was written to clarify the record and reverse the illusion by providing a full account of the development of the experiments. There is little doubt that *Management and the Worker* struck a nerve among human relations specialists. Writing in *The Personnel Journal*, Charles Slocombe, director of the Personnel Research Foundation, called it “the most outstanding study of industrial relations that has been published anywhere, anytime.” Stuart Chase, writing to a general audience in *Reader's Digest*,

declared it: "the most exciting and important study of factory workers ever made ... There is an idea here so big it leaves one gasping."

Today, reference to "the Hawthorne effect" denotes a situation in which the introduction of experimental conditions designed to identify salient aspects of behavior has the consequence of changing the behavior it is designed to identify. When people realize that their behavior is being examined, they change how they act. Obviously, such changes are of methodological interest to psychologists who need to separate aspects of behavior that are natural from behavior that results from the experiment itself. The initial Hawthorne effect referred to the observation that the productivity of the workers increased over time with every variation in the work conditions introduced by the experiments. Those workers captured under the microscope put their best foot forward to show themselves in a more positive light, to work more effectively and to weather the tribulations of industrial work with personal grace and dignity. The evidence for this methodological artifact emerged from the illumination experiments and from the relay assembly tests.

The Illumination and Relay Assembly Tests

The illumination experiments were initially designed to determine whether increases in artificial lighting on the factory floor could reduce accidents and eyestrain and thus increase productivity. The electrical industry had a considerable investment in establishing the industrial advantages of enhanced lighting, and the National Research Council became involved with a blue ribbon panel of experts headed by Thomas Edison to explore the effects of changes in illumination. The experiments were conducted at the Hawthorne plant over a three-year period (1924-1927) and involved the manual winding of induction coils for telephone systems. It was clear to the engineers that it would be difficult to separate the net effect of illumination from the effects of other changes created by the experimental conditions. Researchers measured baselines in productivity and interviewed the workers about the changes in illumination. The foremen measured outputs during the day to identify changes in levels of productivity. Because the experiment was no secret, a control group of workers not subject to the same detailed supervision increased their output with the development of informal competition between the two groups.

Roethlisberger and Dickson provided the classic report of the study in the Introduction to *Manage-*

ment and the Worker. They noted that even when illumination values were decreased, output increased. In fact, in one variation, when the light was cut down to .06 of a foot-candle "an amount of light approximately equal to that of an ordinary moonlight night ... the girls maintained their efficiency (1939:17)." It appeared as though the physical changes in illumination were less consequential than the psychological effects. In the 11 periods of the experiment, both the control group and the experimental group showed an improvement from the baseline regardless of whether the illumination was increased, decreased or remained constant. In the end "the results of these experiments ... failed to answer the specific question of the relation between illumination and efficiency" (p. 18) but they did establish the value of empirical studies of industrial productivity.

The Relay Assembly Room tests started in April 1927 and continued until June 1932 when the demand for parts was so low due to the Depression that the study was terminated. The Roethlisberger-Dickson report covers the first 13 periods, ending in June 1929. This was the best-known phase of the Hawthorne study, and the one that has received the greatest empirical scrutiny. It reflects the theoretical ideas of Elton Mayo who suggested that in modern industrial conditions, worker motivation was not a simple function of exhaustion or fatigue, as behaviorist understandings of human nature would suggest. Nor was productivity determined primarily by material aspirations once a certain level of creature comforts was established. In terms of fatigue and exhaustion, although this was a concern in 19th century conditions of production such as mining and forestry, machines had increasingly replaced human labor. For Mayo, complaints of fatigue among modern workers were probably an indication of morale problems and workplace maladjustment. As for a focus on income, Mayo suggested that, while important, workers also put great stock in the social dimensions of work and their development of a humane set of relationships with co-workers and supervisors. The Hawthorne researchers increasingly recognized the importance of grasping the "total situation" of the workers both on and off the job and their "sentiments"—their emotional life, cultural values and personal aspirations. Mayo's insight was lost, however, when the post-war criticisms of Hawthorne stressed the role of self-interest in the level of productivity and in the restriction of productivity by piece workers; these criticisms were

based on an analysis of only one aspect of the research findings.

Changes in the relay assembly test room included the introduction of a group rate calculated on the productivity of the test room workers, introduction of break periods of various lengths at various times during the day, provision of lunch and beverages by the company, and alterations in the weekly work schedule (shortened days, shorter week). The monitor for the experiment, rather than being detached, took on a friendly, supervisory role. The output was calculated mechanically with a ticker tape machine, and by manual summaries. The monitor made notes about the small talk engaged in by the workers. As the experiment developed, the workers, all young women in their late teens and early 20s (with one exception) began to socialize outside of the work place.

The analysis of the changes in productivity is quite detailed but the conclusions were quite simple. The average hourly output per week during the study appears to drift upwards period after period even during the phase in which the pauses were cancelled and the longer workweek restored. "Examination of this chart reveals at once no simple correlations between the experimentally imposed changes in working conditions and rate of work" (1939: 75). From a baseline of around 50 relays an hour in the first weeks of the study, the women increased their output to 60 or 70 relays per hour by the end.

The Mica Splitting Tests

To determine whether changes in output reflected changes in wages, the researchers introduced two further variations in work conditions: a second relay assembly test group to test the effect of compensation, and a mica splitting test group to test the effect of isolation. The former worked as a team on the shop floor dispersed among other workers with the normal form of supervision. For a period of nine weeks they received the team piece rate, then reverted to the shop-wide rate. Productivity seemed to increase initially but two operators continued to report inflated productivity after a return to the old method of payment and two did not—from which Roethlisberger and Dickson (1939: 132-33) said "it was difficult to conclude whether the increase in output was an immediate response to the change in wage incentive." However, they also reported that because of friction on the shop floor between the second relay test group and the rest of the workers, the foreman demanded that

the former method of payment be re-instituted. The teamwork rate was apparently a preferable system of compensation to most workers.

The mica splitting test group was isolated in a separate room but earned the piece rate as the shop floor workers. This began in 1928 and terminated in mid-1930. The gains in productivity were modest and were inconsistent across the different workers. "In both test rooms, output tended to increase in the first year. Also, in both cases the increases followed experimentally induced changes in work conditions. With these two exceptions, however, no parallel developments in the two rooms could be detected" (p. 149). How could this be reconciled with the dramatic changes in output of the original relay assembly group?

Searching for the "Real" Hawthorne Effect

When they got the results from the second round of experiments, Roethlisberger and Dickson changed the research design dramatically. They began to look at the social and cultural context of industrial production. The qualitative data pointed to the dramatic difference in the social situation between the initial relay assembly test group and the subsequent two groups. It is difficult to understate the significance of the original changes initiated at Hawthorne since they marked a paradigmatic shift from a 19th century style of industrial supervision based on worker intimidation to a form of management based on enlightened partnership with labor. This was part of a major liberal thrust in American society that correlated with the arrival of the Roosevelt administration. Intimidation would remain common in management-labor relations in America, but it would increasingly be confined to smaller employers and marginal sectors. At the same time, American Social Psychology was shifting from behaviorism and external reinforcements to symbolic interactionism with its focus on actor perspectives and the nuances of meaning. Under the new paradigm, the relay assembly group was seen to have developed a rare interpersonal tone in which workers did not feel goaded by their bosses. The atmosphere was one of a new employee-supervisory relationship marked by a spirit of cooperation, in which "there was no longer any bosses." Absenteeism declined. Group morale improved. Individuals were more likely to come to one another's assistance. And production soared.

As Keith Davis (1974:35) noted, "what impressed management most were the stores of latent energy and productive cooperation which could be ob-

tained from people working under the right conditions." By contrast in the later Hawthorne experiments with their more modest improvements in productivity, there was an "apprehension of management" and fear of unemployment as the "dreaded depression" (p. 153) threatened an uncertain future. The magic, first glimpsed in the illumination studies and the relay assembly tests, vanished in the later studies. Having established to their satisfaction that productivity was not slavishly linked to wages, Roethlisberger and Dickson were alerted to what they might have called the real Hawthorne effect.

The real Hawthorne effect was the potential change in industrial relationships made possible by the insights of scientific management of the sort proposed by Elton Mayo. The largest part of *Management and the Worker* is not devoted to the relay assembly experiment but to achieving an understanding of the nature of industrial conflict based on a sophisticated understanding of human nature. This was explored through intensive interviewing and turned on the cultivation of an independent professional niche—the human relations experts—who mediated relationships between management and labor. They appeared to be capable of achieving industrial harmony by understanding the difficulty of the fit between the technical processes devised by production engineers and the social and cultural worlds of the labor force. The interview phase involved some 21,000 employees: an entirely unprecedented number in the annals of social science research. The interviews grew from cursory encounters lasting 20-25 minutes and yielding 2 or 3 pages of notes to sessions that ran for hours and resulted in scores of transcript pages. The interviewers were increasingly sensitized to the latent content of worker cognitions in an attempt to capture the "total situation" of the workers, including their "morbidities" and feelings of insecurity arising from both the workplace and the home front. They uncovered deep, interpersonal animosities which often arose from the "attitudes" and "style" of the foremen and fellow workers and which simmered precariously below the threshold of consciousness. Roethlisberger and Dickson realized that industrial production, in a technical sense, was superimposed on a workforce that had its own biographies and coping strategies, some of which included normative expectations about "reasonable" output, often at odds with those of production engineers. The researchers concluded that labor and management experienced work from within different symbolic

universes. "Communication" became a major issue in industrial relations.

The perennial controversy over the Hawthorne studies involves what might be called the small "h" Hawthorne effect. The small "h" is the methodological artifact that contributed to increases in worker productivity in the illumination studies and the initial relay assembly test—but which had no consequence in the case of the bank wiring room. In our view, this was the "illusion" warned of in Mayo's introduction. Much of the condemnation of the Hawthorne studies after World War II appears to be limited to the analysis of the relay assembly data, ignoring the work done after phase one. For example, Alex Carey's summarized his position in the *American Sociological Review* in 1967 as follows. "A detailed comparison between the Hawthorne conclusions and the Hawthorne evidence shows these conclusions to be almost wholly unsupported. The evidence reported by the Hawthorne investigators is found to be consistent with the view that the material, and especially financial, reward is the principal influence on work morale and behavior. Questions are raised about how it was possible for studies so nearly devoid of scientific merit, and conclusions so little supported by the evidence, to gain so influential and respected a place within scientific disciplines and to hold this place for so long." This analysis is based exclusively on the relay assembly test. What we tend to overlook is that even if the authors had concluded from the relay assembly room data that financial incentives were important, of what scientific or managerial relevance would this be given that the initial sample consisted of just five workers, given their non-random recruitment, and given the biased test/re-test nature of the design? Carey's reading reflects the radicalization of the '60s but ignores 75% of the study.

His worries are nonetheless well founded with respect to industrial discipline in the first relay assembly room test. Two operators in the test room who had become antagonistic to the other women seemed to be consciously limiting their output and were returned to the shop floor. Despite the fact that they had been led to believe that enhanced productivity was not an objective of the experiment, they were replaced. The productivity of one replacement, a 15-year-old Italian girl, was outstanding from the outset. As critics have pointed out, her mother had died, and her brother and father were facing unemployment. The record provides convincing qualitative evidence that she was instrumental in trying to elevate levels of collective output—a fact

from which everyone in the test room benefited materially. It is improper, however, to attribute the increase in productivity to the change in the form of remuneration without acknowledging the simultaneous change in the social relations that accompanied the design and the particular motivation of the volunteers. Yet that is what researchers like Carey did.

As though the matter had not been laid to rest by Carey (among others), Stephen Jones in the *American Journal of Sociology* (1992) reexamined the evidence in an article entitled: "Was there a Hawthorne Effect?" Once more returning to the relay assembly test data, he concluded, "contrary to the conventional wisdom in much research and teaching, I have found essentially no evidence of Hawthorne effects, either unconditionally or with allowances for direct effects of the experimental variables themselves. My results appear to be robust across a wide variety of specifications, alternative samples, and two definitions of experimental change ... a fruitful line of sociological inquiry ... would explore the social and historical context whereby the Hawthorne effect has become enshrined as received wisdom in the social sciences" (1992: 457).

This reiterated what Richard Gillespie tackled in his book, *Manufacturing Knowledge: A History of the Hawthorne Experiments* (1991). He suggests that the interests of Harvard management professors and industry managers conspired to downplay the economic determinants of worker motives and their grasp of the industrial environment. The human relations experts selectively interpreted their findings and had them certified in publications over which they had control. Citing Bruno Latour, he holds further that this type of machination is the general process by which knowledge is acquired in science (i.e. "manufactured")—a dubious conclusion given the repeated empirical vulnerability of the findings at every turn. Yet the attraction of Hawthorne lives on. The only way we can reconcile the inconsistency between the empirical challenge of the original results and the adulation of the Hawthorne effect is for the criticisms to be treated as though they are *in addition* to the main findings, that the main idea should not be undermined by these empirical shortcomings—as though the Hawthorne effect and the evidence of it were independent, and as though these were different kinds of knowledge. Sometimes an idea is more important than the evidence on which it is based.

If our approach is correct, the reason that Hawthorne persists in the imagination in spite of the empirical challenges is because it paints a picture of employees and industrial production that is of historical proportions. The employees—workers, foremen and managers alike—are cast as subjects prone to morbid fantasies that they are little capable of understanding. Workers' complaints to management have to be coded in terms of the total situation both on and off the job, both in terms of manifest and latent content. Complaints often reflect obsessive thinking—and the analyst risks ascribing the workers' feelings of personal insecurity and morbidity to elements of the workplace that Mayo thought incapable of explaining them. At the same time, industry is moving away from a system of management through intimidation, historically indifferent to employee sentiments, to a more humane system based on knowledge of human nature. The human relations expert has to coordinate the technical and the human facts of production to maintain both a personal and social equilibrium. So the production task is not simply about creating electrical widgets, but creating social integrity in an industrial system prone to ignoring it, or prone to squandering human potential by failing to understand it.

Understood in this way, the meaning of the Hawthorne effect is not trivialized by the methodological artifact with which it has been equated. The "effect" was a clue to social transformation through expert knowledge glimpsed by a healthy work force operating at optimum levels of achievement in the illumination and relay assembly studies. It was about changing civilization by harnessing the technical engineering of productivity (efficiency, productivity) while steering workers wide of their obsessions and morbid thinking and harnessing their human resources. That is what made the idea so big that it left people gasping, raising the question of whether industrial production based solely on principles of engineering and efficiency was even possible. And it captured the irrational elements in social life, which, on the positive side, turned the small "h" effects into something almost utopian: soaring productivity among cheerful workers who socialized in their off-hours. Yet the research also recognized the darker side. The Hawthorne workers fantasized about "getting even" with those who aggravated them and sometimes worried about being victimized by others. These fantasies, however, were not realized; *those* workers were relatively "well-behaved" when compared to what we have seen in the workforce today.

In more recent years, we have witnessed a series of lethal shootings in workplaces and schools that almost defy comprehension. Disgruntled employees and students wantonly slaughter their former colleagues and co-workers sometimes redressing slights with a degree of violence out of all proportion to the original conflicts. Such cases appear to be unprecedented episodes in the lives of the perpetrators. Evidence suggests that those involved in the reprisal shootings in the workplace were reacting to a lack of workplace respect and a sense of persecution often associated with interpersonal conflicts on the job—not conflicts over money or hours of work. Although we only hear about the extreme cases, verbal threats in the workplace today are legion (Lord, 1998). Criminologists are at a loss to explain why. But a key might be found in the classical Hawthorne research and specifically in a re-assessment of its lessons. The perennial debate over “the” Hawthorne effect—as though it were one thing—misses the original insights of that study, insights of some seventy years ago that could aid in our understanding of the dynamics of worker reactions to brutalized workplaces. The surprises of today were foretold in the Chicago workers’ fantasies of the ’20s and ’30s.

Industries today, having stripped people of job security and reduced workers to “skills sets,” have created a genre of reactions that are generally predictable except in the specifics of the individual occurrences. The human resources specialists seem to be caught off guard, but these reactions would not surprise the pioneering analysts of the early 20th century. Isn’t it time to have another look at Hawthorne?

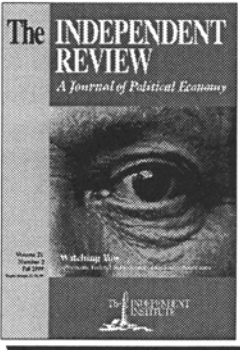
SUGGESTED FURTHER READINGS

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