

# Organizational behavior hawthorne studies



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This paper analyzes the Hawthorne studies that are established to identify the influence of the social, physical, and psychological environment on the workers productivity. The series of experiments conducted is discussed and a criticism examines the results and conclusions of these studies. Are the results of the Hawthorne Studies relevant at all times or were they limited to certain cases?

## **Introduction**

At the beginning of the 20th century, companies were using scientific approaches to improve worker productivity. But that all began to change in 1924 with the start of the Hawthorne Studies, a 9-year research program at Western Electric Companies. The program, of which Elton Mayo and Fritz Roethlisberger played a major role, concluded that an organization's undocumented social system was a powerful motivator of employee behaviour. The Hawthorne Studies led to the development of the Human Relations Movement in business management. The experiment was about measuring the impact of different working conditions by the company itself (such as levels of lighting, payment systems, and hours of work) on the output of the employees. The researchers concluded that variations in output were not caused by changing physical conditions or material rewards only but partly by the experiments themselves. The special treatment required by experimental participation convinced workers that management had a particular interest in them. This raised morale and led to increased productivity. The term 'Hawthorne effect' is now widely used to refer to the behaviour-modifying effects of being the subject of social investigation. The researchers concluded that the supervisory style greatly affected worker

productivity. These results were, of course, a major blow to the position of scientific management, which held that employees were motivated by individual economic interest. The Hawthorne studies drew attention to the social needs as an additional source of motivation. Economic incentives were now viewed as one factor, but not the sole factor to which employees responded.

## **Experiments**

### **2. 1 Illumination studies**

In the early 1920s Chicago's Western Electric Hawthorne Works employed 12, 000 workers. The plant was a primary manufacturer of telephones, and in 1924 the company provided a site to cooperate with the NRC on a series of test room studies to determine the relationship between illumination and worker efficiency. The basic idea was to vary and record levels of illumination in a test room with the expectation that as lighting was increased, productivity would too. In another test room, illumination was decreased, with the correlating expectation that efficiency would decrease. The electric power industry provided an additional impetus for these tests, hoping to encourage industries to use artificial lighting in place of natural light. The Illuminating Engineering Society's Committee on Research also supported the tests and cooperated with the NRC. Workers were notified of the tests in order to attempt to control interference from human factors. When production increased in each test period, researchers looked to other factors such as increased supervision and a sense of competition that developed between the test and control groups. But the one conclusion the impressive team of industrial specialists and academics discovered was the

lack of a consistent correlation between lighting levels and product output. No further tests were planned originally, but researchers were surprised at the unanticipated results.

The National Research Council researchers concluded that a variety of factors must affect industrial output other than just the lighting effect because they continued to produce 7 million relays annually.

### **Relay assembly test room experiment**

In order to observe the impact of these other factors, a second set of tests was begun before the completion of the illumination studies on April 25, 1928. The relay-assembly tests were designed to evaluate the effect rest periods and hours of work would have on efficiency. Researchers hoped to answer a series of questions concerning why output declined in the afternoon: Did the operators tire out? Did they need brief rest periods? What was the impact of changes in equipment? What were the effects of a shorter work day? What role did worker attitudes play? Hawthorne engineers led by George Pennock were the primary researchers for the relay-assembly tests, originally intended to take place for only a few months. Six women operators volunteered for the study and two more joined the test group in January 1928. They were administered physical examinations before the studies began and then every six weeks in order to evaluate the effects of changes in working conditions on their health. The women were isolated in a separate room to assure accuracy in measuring output and quality, as temperature, humidity, and other factors were adjusted. The test subjects constituted a piece-work payment group and efforts were made to maintain steady work patterns. The Hawthorne researchers attempted to gain the women's

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confidence and to build a sense of pride in their participation. A male observer was introduced into the test room to keep accurate records, maintain cordial working conditions, and provide some degree of supervision.

The women were employed in assembling relays or electromagnetic switches used in switching telephone calls automatically. The women assembled the more than 35 parts of the relay by hand. The relays were then carefully inspected. The entire process was highly labor intensive and the speed of assembly had an obvious effect on productivity.

Initially the women were monitored for productivity, and then they were isolated in a test room. Finally, the workers began to participate in a group payment rate, where extra pay for increased productivity was shared by the group. The other relay assemblers did not share in any bonus pay, but researchers concluded this added incentive was necessary for full cooperation. This single difference has been historically criticized as the one variable having the greatest significance on test results. These initial steps in the relay-assembly studies lasted only three months. In August, rest periods were introduced and other changes followed over the rest of the test period, including shortened work days and weeks. As the test periods turned from months into years, worker productivity continued to climb, once again providing unexpected results for the Hawthorne team to evaluate.

Productivity increased in excess of 30 percent over the first two and-a-half years of the studies and remained steady for the duration of the tests. The physicals indicated improved worker health and absenteeism decreased. By

their own testimony, the women expressed increased satisfaction with all aspects of their jobs. Researchers tentatively concluded that performance and efficiency improved because of the rest periods, relief from monotonous working conditions, the wage incentive, and the type of supervision provided in the test environment. After additional study and consideration, the first two factors were rejected and further tests were conducted in an attempt to verify the effects of incentives and working conditions. The results were still not totally conclusive. Finally, researchers realized worker attitudes within the group were influential as was the more personal atmosphere of the test room. They concluded factors such as lighting, hours of work, rest periods, bonus incentives, and supervision affected workers, but the attitudes of the employees experiencing the factors were of greater significance. As a result, the Hawthorne team decided not to pursue similar studies. Almost as significant during the relay assembly tests was the introduction of a team of academics from the Harvard Business School into the experiments. Led by professors Elton Mayo and F. J. Roethlisberger, this new group of researchers would have an enormous impact on the Hawthorne studies and the future of human relations in the workplace.

However the same experiment was done on a group of 6 women placed in the same room whereas the production increased because they felt like a group where they were all connected through a team work. This is common sense, just like in a class room; as students meet day by day and study together the same materials, they will feel a sense of freedom that they do not experience in a playground floor.

Mayo's contributions became increasingly significant in the experiments during the interviewing stages of the tests. Early results from the illumination tests and the relay-assembly tests led to surveys of worker attitudes, surveys not limited to test participants.

### **2. 2. 1 Work Conditions and Productivity Results**

Under normal conditions with a forty-eight hour week, including Saturdays, and no rest pauses. The girls produced 2, 400 relays a week each.

They were then put on piecework for eight weeks.

Output increased

They were given two five-minute breaks, one in the morning, and one in the afternoon, for a period of five weeks.

Output increased, yet again

The breaks were each lengthened to ten minutes.

Output rose sharply

Six five-minute breaks were introduced.

The girls complained that their work rhythm was broken by the frequent pauses

Output fell only slightly

The original two breaks were reinstated, this time, with a complimentary hot meal provided during the morning break.

Output increased further still

The workday was shortened to end at 4. 30 p. m. instead of 5. 00 p. m.

Output increased

The workday was shortened to end at 4. 00 p. m.

Output leveled off

Finally, all the improvements were taken away, and the original conditions before the experiment were reinstated. They were monitored in this state for 12 more weeks.

Output was the highest ever recorded – averaging 3000 relays a week

## **2. 2. 2 Study Conclusions**

The aptitudes of individuals are imperfect predictors of job performance.

Although they give some indication of the physical and mental potential of the individual, the amount produced is strongly influenced by social factors.

Informal organization affects productivity. The researchers discovered a group life among the workers. The studies also showed that the relations that supervisors develop with workers tend to influence the manner in which the workers carry out directives.

Work-group norms affect productivity. The Hawthorne researchers were not the first to recognize that work groups tend to arrive at norms of what is “ a fair day’s work.” However, they provided the best systematic description and interpretation of this phenomenon.



The workplace is a social system. The researchers came to view the workplace as a social system made up of interdependent parts. The worker is a person whose attitudes and effectiveness are conditioned by social demands from both inside and outside the work plant. Informal group within the work plant exercise strong social controls over the work habits and attitudes of the individual worker.

The need for recognition, security and sense of belonging is more important in determining workers' morale and productivity than the physical conditions under which he works.

The major finding of the study was that almost regardless of the experimental manipulation, worker production seemed to continually improve. One reasonable conclusion is that the workers were happy to receive attention from the researchers who expressed an interest in them. Originally, the study was expected to last one year, but since the findings were inexplicable when the researchers tried to relate the worker's efficiency to manipulated physical conditions, the project was incrementally extended to five years.

### **2.3 Bank-Wiring Tests**

The bank-wiring tests began in November 1931. The foreman of the bank-wiring department resisted the intrusion of observers into his work space and a bank-wiring test room was set up. The test room housed nine wirers, three solderers, and two inspectors. All were male between the ages of 20 and 25. Their job was to wire conductor banks, a repetitive and monotonous task. The banks were one of the major components of automatic telephone

exchange. Between 3, 000 and 6, 000 terminals had to be wired for a set of banks. The work was tiring and required the workers to stand for long periods of time. Pay incentives and productivity measures were removed, but a researcher was placed into the test room as an observer and the workers were interviewed. The purpose of the bank-wiring tests was to observe and study social relationships and social structures within a group, issues raised by two other significant members of the research team, W. Lloyd Warner and William J. Dickson. Warner was on Mayo's Harvard team, trained as an anthropologist and primarily interested in Hawthorne from an entirely different perspective, that of an observer of the social behavior of a group. Perhaps the most revealing aspect of the bank-wiring tests was that the workers combined to slow down production-a clear indication of the need for analysis of the social relationships of workers. Research showed the most admired worker among the group was the one who demonstrated the greatest resentment of authority by slowing down production the most.

The bank-wiring tests were shut down in the spring of 1932 in reaction to layoffs brought on by the deepening depression. Layoffs were gradual, but by May the bank-wiring tests were concluded. These tests were intended to study the group as a functioning unit and observe its behavior. The study findings confirmed the complexity of group relations and stressed the expectations of the group over an individual's preference. The conclusion was to tie the importance of what workers felt about one another to worker motivation. Industrial plants were a complex social system with significant informal organizations that played a vital role in motivating workers. The researchers found that although the workers were paid according to

individual productivity, productivity decreased because the men were afraid that the company would lower the base rate. There was no trust between employees and researches, so they simply held down production to the level they thought was in their best interest; the same thing happens when a classmates of yours steal the exam paper and the administration finds out. You would not say who did it because you wouldn't want your classmate to be kicked out of school. So, your interest is to say that you do not know hoping that they don't change the exam answers.

Employees had physical as well as social needs, and the company gradually developed a program of human relations including employee counseling and improved supervision with an emphasis on the individual workers. The results were a reinterpretation of industrial group behavior and the introduction of what has become human relations.

### **3. The Interview Process**

I think interviewing is a good idea. It helps some people get a lot of things off their chest. Assisting Mayo was his research assistant, Fritz Roethlisberger. Under Mayo and Roethlisberger's direction, the Hawthorne experiments began to incorporate extensive interviewing. The researchers hoped to glean details (such as home life or relationship with a spouse or parent) that might play a role in employees' attitudes towards work and interactions with supervisors. From 1928 to 1930 Mayo and Roethlisberger oversaw the process of conducting more than 21, 000 interviews and worked closely training researchers in interviewing practices.

Mayo and Roethlisberger's methodology shifted when they discovered that, rather than answering directed questions, employees expressed themselves more candidly if encouraged to speak openly in what was known as nondirected interviewing. "It became clear that if a channel for free expression were to be provided, the interview must be a listening rather than a questioning process," a research study report noted. "The interview is now defined as a conversation in which the employee is encouraged to express himself freely upon any topic of his own choosing."

Interviews, which averaged around 30 minutes, grew to 90 minutes or even two hours in length in a process meant to provide an emotional release. You always want to feel appreciated and taken into consideration from your boss or any other higher authority you are working with. This can create a trusting circle between both. Just like when you are supposed to learn from your teacher the materials she is giving you and at the same time you ask her for her advice on your personal life and start telling her what is going on with you in your daily life. You will feel a close relationship that connects you with the teacher and you will start to listen to her more and take into consideration what she is giving you as materials because there is a trust circle between both.

The resulting records, hundreds and hundreds of pages in which employees disclose personal details of their day to day lives, offer an astonishingly intimate portrait of the American industrial worker in the years leading to and following the Depression. In a pre-computer age, thousands of comments were sorted into employees' attitudes about general working conditions, specific jobs, or supervisors and among these categories into <https://assignbuster.com/organizational-behavior-hawthorne-studies/>

favorable and unfavorable comments used to support interpretations of the data. Both workers' and supervisors' comments would aid in the development of personnel policies and supervisory training, including the subsequent implementation of a routine counseling program for employees.

Roethlisberger discovered that what employees found most deeply rewarding were close associations with one another, "informal relationships of interconnectedness," as he called them. "Whenever and where it was possible," he wrote, generated them like crazy. In many cases they found them so satisfying that they often did all sorts of non logical things...in order to belong. In Mayo's broad view, the industrial revolution had shattered strong ties to the workplace and community experienced by workers in the skilled trades of the 19th century. The social cohesion holding democracy together, he wrote, was predicated on these collective relationships, and employees' belief in a sense of common purpose and value of their work.

#### **4. The Hawthorne Legacy**

The Hawthorne studies were conducted in three independent stages-the illumination tests, the relay-assembly tests, and the bank-wiring tests, although each was a separate experiment. The second and third each developed out of the preceding series of tests. Neither Hawthorne officials nor NRC researchers anticipated the duration of the studies, yet the conclusions of each set of tests and the Hawthorne experiments as a whole are the legacy of the studies and what sets them apart as a significant part of the history of industrial behavior and human relations.

The tests challenged prior assumptions about worker behavior. Workers were not motivated solely by pay. The importance of individual worker attitudes on behavior had to be understood. Further, the role of the supervisor in determining productivity and morale was more clearly defined. Group work and behavior were essential to organizational objectives and tied directly to efficiency and, thus, to corporate success. The most disturbing conclusion emphasized how little the researchers could determine about informal group behavior and its role in industrial settings. Finally, the Hawthorne studies proved beyond certainty that there was a great deal more to be learned about human interactions in the workplace, and academic and industrial study has continued in an effort to understand these complex relationships.

Beyond the legacy of the Hawthorne studies has been the use of the term “Hawthorne effect” to describe how the presence of researchers produces a bias and unduly influences the outcome of the experiment. In addition, several important published works grew out of the Hawthorne experience, foremost of which was Mayo’s *The Human Problems of an Industrial Civilization* and Roethlisberger and Dickson’s *Management and the Worker*.

The Hawthorne studies have been described as the most important social science experiment ever conducted in an industrial setting, yet the studies were not without their critics. Several criticisms, including those of sociologist Daniel Bell, focused on the exclusion of unionized workers in the studies. Sociologists and economists were the most commanding critics, defending their disciplinary turf more than offering serious criticisms. Despite these critical views, the flow of writings on the Hawthorne studies attests to their lasting influence and the fascination the tests have held for

researchers. The studies had the impact of defining clearly the human relations school. Another contribution was an emphasis on the practice of personnel counseling. Industrial sociology owes its life as a discipline to the studies done at the Hawthorne site. This, in part, led to the enormous growth of academic programs in organizational behavior at American colleges and universities, especially at the graduate level.

## **5. Criticism of Hawthorne Studies**

The influence of Hawthorne studies has declined in the last ten years as a result of widespread failure of later studies to reveal any reliable relation between the social satisfaction of industrial workers and their work performance but still, reputable textbooks still refers almost reverentially to the Hawthorne studies as a classic in the history of social science in industry. There have been a broad criticism and assumptions, many of them cogent. How is it that nearly all authors of textbooks who have drawn material from the Hawthorne studies have failed to recognize the vast discrepancy between evidence and conclusions of those studies, have frequently miss described the actual observations and occurrences in a way that brings the evidence into line with the conclusions reached by Hawthorne studies?

This part of the project will critically examine the evidence and arguments from which the investigators reached conclusions. The first hypothesis made states that the change in work task and physical context help in the 30 percent increase in the productivity of the workers. Considering the girls on the relay room the one who had several tasks to do has improved the less and then when they put her in the group with the other girls doing one task she improved but that was not a conclusive evidence in favour of the

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hypothesis so the investigator had to dismiss it. Second hypothesis states that the reduced fatigue due to rest pauses and shorter working hours played a role in the 30 percent increase but medical examination could not provide evidence of fatigue effect so this hypothesis was also dismissed. In stage II, the girls wage was based on the average output of the whole department and their productivity increased by 13 percent. But it promptly dropped by 16 percent when the experiment was discontinued. Here a hypothesis was made that the wage incentive was in effect but the investigators also were not impressed by this evidence and did not support it. A comparison is made between the first three stages. Stage III produced a claimed of 15 percent increase in rate of output over 14 months, thereafter the average rate of output declined due to depressions. The investigators attribute the decline and ignored the possibility that the increase also could have been influenced by changing general economic and employment conditions. Also, the peak output for each girl did not occur at the same dates. It turned out that there is no one period over which the group achieved the increased claimed. In stage I, two measures of the workers performance were used: Total output per week and hourly rate of output per week. In the report of this stage it is not clear in which output is the increase. This has lead to misunderstanding and misinterpretation of the Hawthorne studies results.

Here several points are of present importance. For stage I, it is not clear wither the 30 percent increase in the output claimed refers to rate of output or total output. For stage III, if total output per week is used to measure performance, the 15 percent increased claimed reduces to less than zero



because although output per hour increased by 15 percent, the weekly hours decreased by 17 percent. From evidence to conclusion, the investigator concluded that 15 percent remains as the maximum amount to be attributed but they decided that it is impossible to consider a wage incentive as a thing in itself having an independent effect on individual. Here we should appreciate how invalid are the influences made. In stage I, friendly supervision and a change to a preferred incentive system led to an increase in total output about 30 percent. In stage III, friendly supervision without a change in payment system led to no increase in total output. The investigator concluded that the effect of a wage incentive system is not greatly influenced by social considerations that it is impossible to consider it capable of independent effect. None of the results of the three first stages gave the slightest substantiation to the theory that the workers are primarily motivated by economic interest. The evidence indicates that the efficiency of a wage incentive is so independent on its relation to other factors and cannot be taken as an independent effect. This conclusion is a contrast to the objectives results obtained.

The critical examination attempted here shows the error and the incompetence in the understanding and use of scientific method in the Hawthorne studies from beginning to end. There are major deficiencies in stages I, II and III. First there was no attempt to establish sample groups representative any larger population than the groups themselves, therefore no generalization is legitimate. Second, there was no attempt to employ control data from the output records of the girls who were not put under special experimental conditions. Third, even if both previous points had been

met, the experiments would still have been of minor scientific value since a group of five subjects is too small to yield statistically reliable results. These points make it clear that the evidence obtained from stages I, II and III does not support any of the conclusions derived by Hawthorne investigators. The results of these studies are far from supporting the various components of the “ human relation approach” and are surprisingly consistent with a rather old-world view about the value of monetary incentives, driving leadership and discipline. It is only by massive and relentless reinterpretation that the evidence is made to yield contrary conclusions. The limitations of the Hawthorne studies clearly render them incapable of yielding serious support of any sort of generalization whatever.

## **6. Conclusion**

The Hawthorne studies have been described as the most important social science experiment ever conducted in an industrial setting, yet the studies were not without their critics. It started on a good basis by trying to define the influence of the social, physical and psychological environment on the industrial workers. This breakthrough would have been of a great importance if the investigators have been more careful about the weak points they did. They should have tried to work on a single measurement as the total output of the workers in order to be more specific in their claims and they should not have limited their studies to a small group on the contrary they would have enlarge the groups and diversify them in order to be able to generalize their conclusions and achieve a great scientific value. If these critics were taken into consideration in the first place, Hawthorne studies would have been applicable at all times and taken as a reference concerning the

relationships between the social, physical, psychological environment and workers' productivity.