

SOCI 425

Industrial Sociology I

Session Three: The Hawthorne Studies and the
Appearance of Sociology in Industry I

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2014/2015 – 2016/2017

Session Overview

- **Overview**
- The Sociological Approach to the study of Industry could be traced to the Hawthorne Studies. This session focuses on the first two Experiments that constituted the Hawthorne Studies and their relevance to the understanding of the Sociological Approach to the study of Industry.
- **Objective:** At the end of the lecture, the student will be able to
- Describe the Illumination Experiment;
- Describe the Relay Assembly Test Room Experiment;
- Explain how these Experiments brought out human factors in industry;

Session Outline

The key topics to be covered in this session are as follows:

- Topic One: Background to the Hawthorne Experiment
- Topic Two: The Illumination Experiment
- Topic Three: The Relay Assembly Test Room Experiment
- Topic Four: Results/ Lesson from the Experiments

Topic One: Background to the Hawthorne Studies

- The Hawthorne studies can be described as the cradle or the birth of Industrial Sociology i.e. **the study served as a water-shed of the discipline – Industrial Sociology;**
- There is a complete agreement that Industrial Sociology dates from the extensive studies conducted by Elton Mayo;
- And his associates: **F.J. Roethlisberger and W.J. Dickson** at the Hawthorne Plant of the Western Electric Company in Chicago between 1924 and 1932.

Background to the Hawthorne Studies

Cont.

- In the early phases of the Hawthorne Studies, Mayo and his chief collaborators F.J. **Roethlisberger** and **W.J. Dickson** were not at all concerned with industrial social structure;
- But with the effects of physical and physiological factors, such as amount of light and fatigue and their relation to productivity;
- It was only in the latter phases of the study that the importance of social structural factors was discovered.
- The elements of social structure with which the Hawthorne studies became concerned with was the patterns of interpersonal relations that develops in specific social situation.

Background to the Hawthorne Studies

Cont.

- The Hawthorne Studies consist of three experiments namely:

1. The Illumination (Light) Experiment;

2. The Relay Assembly Test Room (RATR) Experiment;

3. Bank Wiring Observation Room (BWOR) Experiment.

Background to the Hawthorne Studies

Cont.

- The Hawthorne Studies was conducted at the Hawthorne Plant of the Western Electric Company in Chicago between 1924 and 1932;
- The Western Electric Company manufactures equipment for the Bell Telephone System;
- In all material conditions, the Company was a very progressive one with several welfare benefits such as;
- Good Pension Schemes, Sickness Benefits, Good Salaries as well as numerous recreational and other facilities;

Background to the Hawthorne Studies

Cont.

- In spite of all the above benefits, there was a great deal of grumbling and dissatisfaction among the over 30,000 employees of the company;
- The company management did not understand the dissatisfaction among the workers despite its several welfare benefits;
- As a result, in 1924, a group of researchers from the National Academy of Sciences were invited to the Hawthorne plant to investigate the sources of workers dissatisfaction.

Topic Two: The Illumination (Light) Experiment

- This was the first of experiment in the Hawthorne works of Western Electric Company conducted between 1924 and 1927;
- A group of scientists had set up the experiment to find out why the administrative organization could not determine human co-operation as exactly as engineers determined technical and operational matters;
- They therefore assumed that, there would be a relation between physical conditions such as light or illumination and productivity.

The Illumination(Light) Experiment Cont.

❑ Objective of the Experiment

- To establish the relationship between the efficiency or output of the worker and illumination in the work place;
- In other words the experiment was to find out the effect of different degrees of lighting on productivity;

❑ Hypothesis of the Experiment

- It was naively assumed that the better the light, the higher the output and the worse the light, the worse the output;
- Simply put, the better the lights, the better the output of work and the worse the light, the worse the output of work.

The Illumination(Light) Experiment: Cont.

□ Methodology

- Two groups of employees were selected namely; the Experimental group and the Control group;
- In the Experimental Group, light was increased in intensity from 100, 150 to 200 Watts etc.;
- In the Control Group, illumination remained unchanged throughout the experiment.

The Illumination (Light) Experiment Cont.

□ Results of the Experiment

- The experimenters felt satisfied when they observed that when light in the experimental room increased, production also increased according to their expectation;
- Light progressively was raised to 100, 150 and 200 watts and production correspondingly increased;
- But after a while, they were disappointed when for no apparent reason, output also went up in the control room where no changes had been made;
- In other words, both Experimental and Control groups experienced changes in production.

The Illumination(Light) Experiment Cont.

- With lighting diminished in the experimental room, production again rose, while in the control room, with lighting constant, production also rose;
- The researchers therefore concluded that there was no consistent relationship between output of workers and illumination in the factory;
- That is illumination was not the cause of increased or decreased in productivity;
- Based on the above outcome, obviously some other factors must be at work which increased output regardless of either greater or less intensity of light in the work place.

Topic Three: The Relay Assembly Test Room (RATR) Experiment

- As a result of the failure of the Illumination Experiment to establish a relationship between workers output and the intensity of light at the factory;
- Elton Mayo and his associates therefore set up the Relay Assembly Test Room (RATR) Experiment to identify the factors contributing to increase in productivity;
- Mayo & Co. decided to conduct further studies to find out what was the cause of increase or decrease in workers output;
- This experiment was known as the RATR and lasted from 1927 and 1932.

The Relay Assembly Test Room (RATR) Experiment Cont.

❑ Objectives of the Experiment

- The general aim of this experiment was to define more precisely the effect of the **physical environmental factors** on productivity;
- The researchers also concentrated on certain specific social factors such as the effect of fatigue, rest pauses;
- Shorter working days, employee attitude towards their own work and company, changes in the working environment etc.

The Relay Assembly Test Room (RATR) Experiment Cont.

□ Preparations for the Experiment

- Two girls working in the general department were invited at the beginning to start the experiment.
- The two girls were in turn asked to invite two other each making a total of six.
- Five of them served as ordinary operatives and the sixth girl lay out or fed them with the material for the relay.
- The group of five girls were placed in a separate where their conditions of work could be careful controlled;
- Their output could be measured, and where they could be closely observed;

The Relay Assembly Test Room (RATR) Experiment Cont.

- It was decided to introduce at specified intervals different changes in working conditions and to see what effect these innovations had on output;
- The observer who was to be with them undertook the task of keeping accurate records of all that took place;
- Including conversations as well as maintaining a friendly atmosphere with a minimum supervision;
- An innovation was introduced in the room which was concerned with **supervision**;
- He kept the girls informed about the experiments, asking for advice or information and listening to their complaint.

The Relay Assembly Test Room (RATR) Experiment Cont.

□ Schedule/Order of Event

- The experiment was divided into fourteen (14) periods and lasted between 1927 and 1932;
- These fourteen (14) periods could be classified into three (3) main phases namely:
 - Adaptation Period (I-III)
 - Experimental Period (IV-XI)
 - Progress and Decline (XII-XIV)

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD I**
- **Duration:** from 25-4-27 to 10-5-27 – approximately two weeks
- The researchers kept silent watch on the five girls selected for the experiment while they were still working in the general Department.
- The object of this was to ascertain the standard rate of production which was obtained in normal conditions, so that the rate to be attained at the various stages of the experiment could be compared with it.
- At this period the girls did not know that they were being observed.
- The basic output registered was 2400 relays per girl in a 48- hour week, or less than a minute per relay.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD II**
- **Duration:** From 10-5-27 – five weeks.
- The girls were transferred to the test room, which happened to be the same room previously used for the light experiments, where they continued working under ordinary or standard conditions except for the presence of an observer and the record of output;
- For this and every change to be subsequently made the girls were consulted.
- As in the Department, they worked 48 hours a week distributed into five $8\frac{3}{4}$ - hour days and one half day of $4\frac{1}{4}$ hours.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD III**
- **Duration:** from 13 -6 – 27 to 6- 8 -27 – Eight weeks
- This was still a period of adaptation and here the sixth girl was introduced as a “feeder” of the group;
- And the group itself, composed of five girls, was placed at a piece- rate payment;
- Thus the common earnings had to be divided by five, giving one part to each girl.

- **Result:** Output went on increasing to nearly 2,500 relays.
- **Working Time:** 48 hours per week.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD IV**
- **Duration:** From 8-8-27 to 10-9-27 – Five weeks
- **Experiment begins:** Two five minute rest- pauses were introduced; one morning at 10, and one in the afternoon at 2.
- **Result:** Output leveled (neither increase nor decrease).
- **Working Time:** 47.07 hours per week.
- **PERIOD V**
- **Duration:** From 12 – 9- 27 to 8 – 10 -27 – four weeks.
- Rest- pauses were increased to ten minutes each
- **Result:** sharp increase in production.
- **Working Time:** 46.10 hours per week.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD VI**
- **Duration:** From 10 – 10 -27 to 5- 11- 27 – four weeks
- Six five- minute pauses were introduced at 8.45, 10. 00, 11.20, 2.00, 3.15, 4.30. When the girls were consulted about these pauses they did not favor them and complained that their work rhythm had been interrupted.
- **Result:** production decreased slightly for the first time.
- **Working Time:** 46.15 hours per week.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD VII**
- **Duration:** from 7- 11 – 27 to 21 – 1 -28 – Eleven weeks.
- A 15 – minute rest-pause for lunch (paid by the company) was introduced at 9.30 in the morning; and another of 10 minutes for rest in the afternoon at 2.30. Girls felt fine.
- **Result:** production increased up to the level of Period V – 2,500 units – the highest hitherto recorded. The lunch and rest- pauses became standardized for the rest of the R.A.T.R. experiment.
- **Working Time:** 45.40 hours per week.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD VIII**
- **Duration:** From 21 – 1 – 28 to 10 – 3 – 28 – seven weeks
- At this period two non- cooperative girls were returned to the general Department and two new ones took their place;
- Everything remained as in Period VII, but they stopped work at 4:30 hours per week, or half an hour before the usual time;
- **Results:** production went up sharply;
- **Working time:** 43.10 hours per week, or 10 per cent less than the original 48 hours.

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD IX**
- **Duration:** From 12- 3- 28 to 7 – 4 – 28 – four weeks
- As in period VII. But work stopped at 4.00
- **Result:** Average hourly output rose; but daily and weekly outputs fell slightly.
- **Working time:** 40.40 hours per week
- **PERIOD X**
- **Duration:** From 9 – 4 – 28 to 30 – 4 – 28 – Twelve weeks.
- As in period VII. Work stopped at 5:00 p.m.
- **Result:** Daily and weekly averages reached the highest levels, 2,888 relays, though the hourly average decreased

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD XI**
- **Duration:** From 2 – 7 – 28 to 1 – 9 – 28 – Nine weeks.
- Conditions were the same as in the previous period (equal to Period VII) with the difference that work on Saturday mornings was suppressed.
- **Result:** Output the same as in period X, though there is a slight fall in weekly total;
- But it is still higher than in any other period excepting VIII and X .

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD XII**
- **Duration:** From 3 – 9 – 28 to 24 – 11 – 28 – twelve weeks.
- All improvements were suppressed including rest pauses, snacks, time off, etc. things returned to the same state as in Period III including the group piece- work scheme.
- **Result:** Daily and weekly output shot up to a new record of 2,900 relays per week – the highest ever reached!
- Hourly production went down slightly
- **Working Time:** 48 hours weekly (a maximum).

The Relay Assembly Test Room (RATR) Experiment Cont.

- **PERIOD XIII**
- **Duration:** from 26 – 11 – 28 to 29 – 2 – 29 – Thirty – one weeks.
- The longest period of all.
- Return to the same conditions as in period VII; but the company furnished only hot tea and the operatives their own lunch.
- **Result:** All previous records beaten including that of the previous Period – 3,000 relays.
- **Working Time:** 45-40 hours weekly.
- **PERIOD XIV**
- **Duration:** From July to December 1931 – this can hardly be called a Period.
- Conditions the same as in Period XIII but interest in the experiment began to wane owing to the great Depression which began asserting itself.
- **Result:** Out varied. It began to fall with the fear of recession.

Topic Four: Results Relay Assembly Test Room (RATR) Experiment.

□ Results or Findings of the RATR

- In these experiments, a small homogeneous work group of six girls was constituted;
- These girls were friendly to each other and were asked to work in a very informal atmosphere with little supervision;
- Elton May explained that what actually happened was that the six girls became a **team** who gave themselves wholeheartedly to cooperation;
- The consequence was that they felt to be participating freely without any force.

Results Relay Assembly Test Room (RATR) Experiment Cont.

- They were also happy that they were working without any coercion from above or limitation from below;
- They were working under less pressure than ever before; in reality, it was the presence of social factors;
- The group which had begun as a mere aggregate of six girls without any special ties except physical proximity had little by little transformed into a team;
- Whose members have a common goal and a common feeling of loyalty and the spontaneous recognition of one of them as its natural leader.

Results of Relay Assembly Test Room (RATR) Experiment Cont.

- An atmosphere of freedom and friendliness pervaded the RATR transforming not only the relationship between the girls themselves;
- But also the relationship between them and their supervisors or bosses;
- This was because the girls felt important since they were consulted in very decision their supervisors wanted to take;
- Productivity went up increasingly even when all the physical incentives were taken away;

Results Relay Assembly Test Room (RATR) Experiment Cont.

- It is something which anyone who has had some concrete experience in handling other people intuitively recognizes and practices;
- Whether or not a person is going to give his services wholeheartedly to a group depends, in good part, on the way he feels about his job;
- His fellow workers, and supervisors- the meaning for him of what is happening about him;

Results of Relay Assembly Test Room (RATR) Experiment Cont.

- The researchers concluded that it was social factors such as a feeling of being important, recognition, attention, participation, cohesive group or team work;
- And non-directive supervision were the key for higher productivity and employee morale;
- Conclusively, what the RATR had demonstrated was the importance of employee attitude and sentiments.

Reading List

- Refer to students to relevant text/chapter or reading materials you will make available on Sakai
- Miller and Form (1964). **Industrial Sociology: The Sociology of Work Organization**. New York: Harper and Row Publishers. (Pages 110-135)
- Parker, R. S et al (2005). **The Sociology of Industry**. Sixth Edition. London: Routledge Taylor and Francis Group. (Pages 155-238)
- Mayo, G.E. (1945). **The Social Problems of Industrial Civilization**. Harvard University Press.

Activity/Assignment

- Identify and Discuss the Social Factors that influence productivity in the Relay Assembly Test Room Experiment.

