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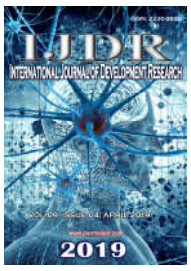

RESEARCH ARTICLE OPEN ACCESS

CAMOUFLAGE IN RESEARCH – THE HAWTHORNE EFFECT

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ABSTRACT

Participant observation can be an excellent way to gather qualitative data and observe real behaviours, provided the participant observer does not cause a behavioural change from the norm. Such a change in behaviour is known as the Hawthorne effect – where people modify their behaviour when they know they are being watched or studied. Though little research has been published on the influence of the Hawthorne effect in simulation studies, it is an inescapable phenomenon that can have a dramatic impact on research. Consequences of research participation for behaviors being investigated do exist, although little can be securely known about the conditions under which they operate, their mechanisms of effects, or their magnitudes. New concepts are needed to guide empiricalstudies.

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INTRODUCTION

A common phenomenon that occurs in open observation studies of workplace modification is that participants, consciousof being observed, will alter their normal behavior, often in a positive direction. The tendency of people to increase their work pace and perform better when they sense they are being observed is referred to as the "Hawthorne effect." (Harrell, 2019). The Hawthorne Effect refers to the manner in which 'variables can be unwittingly confounded in the experiment because of some aspect of the experiment itself. The term is derived from a series of experiments conducted between 1924 and 1932 at the Hawthorne plant of Western Electric Company that sought to determine the influence of changing working conditions on employee productivity. In short, findings showed that productivity increased despite changes in working conditions (Barnes, 2009). The Hawthorne effect derived its name from a study of the psychological aspects plus physical and environmental influences in the workplace at the Hawthorne Plant of the Western Electric Company in Cicero, Illinois, during the 1920s. Workers increased their productivity when they were studied, but it declined when the study finished.

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The results implied that research participants may change their behaviour simply because of the attention they receive, regardless of the experimental manipulation (Sedgwick, 2015).

History

The term "Hawthorne Effect" was coined by researcher Henry A. Landsberger in 1958 when he was conducting an analysis of the earlier experiments conducted between the 1920s and the 1930s. He named the effect after the Hawthorne Works Electric Company in Hawthorne, Illinois, where the first experiment took place. During the above-mentioned period, the electrical company sponsored a study on its workers to see if their productivity would increase when the lighting was changed. The study found out that employee productivity increased when the lighting was increased or decreased. However, productivity decreased when the study ended. Other complementary experiments such as the effect of changes in working hours and work breaks resulted in increased productivity, but worker productivity declined after the conclusion of the study. The results were surprising to the researchers, who concluded that employees were actually responding to the direct attention they were getting from the researchers as well as the supervisors, and not from the changes in the environmental variables. When coining the term "Hawthorne Effect," Landsberger defined the term as a temporary improvement in employee productivity resulting

from being observed while working (https://corporatefinanceinstitute.com).

Literature Support for Hawthorne Effect

- Illumination Experiment
- Relay Assembly Test Experiments
- Mica Splitting Test Group
- The Interview Program
- Bank Wiring Observation Group

Illumination Experiment: Illumination experiments were undertaken to find out how varying levels of illumination affected the productivity. The hypothesis was that with higher illumination, productivity will increase. In the first series of experiments, a group of workers was chosen and placed in two separate groups. One group was exposed to varying intensities of illumination. Since this group was subjected to experimental changes, it was termed as experimental group. Another group, called as control group, continued to work under constant intensities of illumination. The researchers found that as they increased the illumination in the experimental group, both groups increased production. When the intensity of illumination decreased, the production continued to increase in both the groups. The production in the experimental group decreased only when the illumination was decreased to the level of moonlight. The decrease was due to light falling much below the normal level. Thus, it was concluded that illumination did not have any effect on productivity but something else was interfering with the productivity. At that time, it was concluded that human factor was important in determining productivity but which aspect was affecting, it was not sure. Therefore, another phase of experiments was undertaken (https://corporatefinanceinstitute.com).

Relay Assembly test Experiments: Relay assembly test room experiments were designed to determine the effect of changes in various job conditions on group productivity as the illumination experiments could not establish relationship between intensity of illumination and production. For this purpose, the researchers set up a relay assembly test room two girls were chosen. These girls were asked to choose for more girls as co-workers. The work related to the assembly of telephone relays. Each relay consisted of a number of parts which girls assembled into finished products. Output depended on the speed and continuity with which girls worked. The experiments started with introducing numerous changes in sequence with duration of each change ranging from four to twelve weeks. An observer was associated with girls to supervise their work. Before each change was introduced, the girls were consulted. They were given opportunity to express their viewpoints and concerns to the supervisor. In some cases, they were allowed to take decisions on matters concerning them**.**

Following were the changes and resultant outcomes

- The incentive system was changed so that each girl's extra pay was based on the other five rather than output of larger group, say, 100 workers or so.
- Two five- minute rests one in the morning session and other in evening session were introduced which were increased to ten minutes.
- The rest period was reduced to five minutes but frequency was increased.
- The number of rest was reduced to two of ten minutes of each, but in the morning, coffee or soup was served along with the sandwich and in the evening, snack was provided.
- Changes in working hours and workday were introduced, such as cutting an hour off the end of the day and eliminating Saturday work. The girls were allowed to leave at 4.30 p.m. instead of usual 5.00 p.m. and later at 4.00 p.m.

As each change was introduced, absenteeism decreased, morale increased, and less supervision was required. It was assumed that these positive factors were there because of the various factors being adjusted and making them more positive. At this time, the researchers decided to revert back to original position, that is, no rest and other benefits. Surprisingly, productivity increased further instead of going down. This development caused a considerable amount of redirection in thinking and the result implied that productivity increased not because of positive changes in physical factors but because of the change in girls' attitudes towards work and their work group (https://ebrary.net/2915/management/ hawthorne_studies).

The Mica Splitting Test Room: The experiment was conducted in the mica splitting test room. Here, working conditions were manipulated while wages remained stable. This decision stemmed from the hypothesis that wage incentives has influenced worker attitudes, and from the desire to test for that influence. The experimental changes in this room involved introducing rest periods, eliminating overtime work, and modifying 40-hour week.

From the results of these studies, the investigators concluded that:

- The steady increase in the Relay Assembly Test Room was not due to the change in wage incentive only
- The effect of this change in wage incentive was so much tied up with the effects of so many other factors that it was impossible to tell how much influence it had.

Again, the researchers were surprised to find that factors previously assumed to be the most important were cast into doubt, and the less tangible factors appeared to have a greater influence. Although still providing no definite or readily applicable answers, the experiments evidently continued to convince researchers of previously unforeseen influences on human behavior, and that further inquiry would be fruitful.[6]

Theinterviewing Program: These unforeseen influences were more closely examined during the next phase of the experiments; from 1928 to 1930 the interviewing program explored the invisible social and psychological factors influencing worker productivity. During this phase of research, interviewers sought to compile information about workers' general attitudes about issues such as the nature of their jobs, their supervision, and their working conditions. The interviews started as informal discussions wherein the experimenter tried to gear conversations towards specific areas of interest, but were ultimately altered so that the experimenter stated the purpose of the interview and then recorded the employees monologue verbatim. These interviews were thenclassified by

a group of analysts and grouped with similar accounts, ultimately sent along in these groups to the relevant branch or department of the Hawthorne works. This program was extraordinarily wide in its scope – 21,000 employees had been interviewed by the end of 1930. Importantly, because so many workers were interviewed and because they were allowed to report or discuss any factors they wished, this experimental phase revealed, once again, that the invisible processes driving human behavior and experience were infinite. Revealing the scope these influences, the interviewing program began to convince the researchers that the underlying factors driving human behavior defied measurement or precise articulation. The official report of the experiments asserts:"the attitude of the workers was such an important variable that those changes in working conditions which were introduced did not produce by themselves any predictable effect capable of measurement in terms of output."Furthermore, as one industrial psychologist has contended, "while the interviews had initially been meant to provide an overall quantitative picture of worker attitudes, Mayo became more interested in qualitative information about the workers as individuals."In this sense, the interview program further complicated understandings of human behavior by drawing attention to the impact of attitudes and perceptions.

The Bankwiring Observation: The desire to understand these factors with more precision prevailed, and experimenters so conceived the next phase of the experiments; in the bank wiring observation room from 1931-1932, the investigators' sought to more accurately study the social aspects of the work environment whose importance had been revealed through the interviewing program. Here, investigators sought, first, "to develop a method of studying group behavior which would supplement interviewing with actual observations of behavior in the working group," and second, "to obtain more exact information about social groups within the company by making an intensive study of one group under normal shop conditions."By doing so, they could more fruitfully observe employees on-the-job behavior by specifically attending to the sorts of feelings and attitudes mentioned in the course of the interviews. In particular, they wanted to look at how the effect of these feelings and attitudes on work activities, on the extent to which the groups-maintained group standards, and how these group standards affected individual worker efficiency (Cass, 1975). In 1933, the experiments at Hawthorne met their end, albeit one that was unplanned and did not result from a sense of completion or closure. The precise reason for their termination is unknown – some have attributed this to the Depression and a subsequent lack of funding, others to the seemingly inconclusive nature of the studies. In a sense, they never could have been truly complete – the experiments had never posed a singular, clearly defined research question, and consequently moved towards no definite end point. Yet the way the initial research question was answered– that is, that the correlation between illumination and productivity was revealed to be far more complex than initially expected and deeply desired – was sufficient to have alongstanding impact (https://wesscholar. esleyan.edu).

The hawthorne effect and modern-day research: Many types of research use human research subjects and the Hawthorne effect is an unavoidable bias that the researcher must try to take into account when they analyze the results.
Subjects are always liable to modify behavior when they are aware that they are part of an experiment, and this is extremely difficult to quantify. All that a researcher can do is attempt to factor the effect into the research design, a tough proposition, and one that makes social research a matter of experience and judgment. A 1978 study, to establish whether cerebellar neurostimulators could mitigate the motordys function of young adults with cerebral palsy found that the Hawthorne Effect adversely affected the findings. Objective testing showed that all of patients reported that their motor functions improved and that they were happy with the treatment. Quantitative methods, however, showed that there was little improvement, and researchers invoked the Hawthorne Effect as the main factor skewing the results. They believed that the extra attention given to the patients, by the doctors, nurses and therapists, was behind the reported improvements in the initial study (https://explorable.com).

Interpretation and Criticism: Richard Nisbett has described the Hawthorne effect as "a glorified anecdote", saying that "once you have got the anecdote, you can throw away the data (https://www.nytimes.com). Other researchers have attempted to explain the effects with various interpretations. Adair warns of gross factual inaccuracy in most secondary publications on Hawthorne effect and that many studies failed to find it.[10]He argues that it should be viewed as a variant of Orne's (1973) experimental demand effect. So for Adair, the issue is that an experimental effect depends on the participants' interpretation of the situation; this is why manipulation checks are important in social sciences experiments. So he thinks it is not awareness per se, nor special attention per se, but participants' interpretation that must be investigated in order to discover if/how the experimental conditions interact with the participants' goals. This can affect whether participants believe something, if they act on it or do not see it as in their interest, etc. Possible explanations for the Hawthorne effect include the impact of feedback and motivation towards the experimenter. Receiving feedback on their performance may improve their skills when an experiment provides this feedback for the first time. Research on the demand effect also suggests that people may be motivated to please the experimenter, at least if it does not conflict with any other motive. They may also be suspicious of the purpose of the experimenter. Therefore, Hawthorne effect may only occur when there is usable feedback or a change in motivation. Parsons defines the Hawthorne effect as "the confounding that occurs if experimenters fail to realize how the consequences of subjects' performance affect what subjects do" [i.e. learning effects, both permanent skill improvement and feedback-enabled adjustments to suit current goals. His key argument is that in the studies where workers dropped their finished goods down chutes, the participants had access to the counters of their work rate (Parsons, 1974). Mayo contended that the effect was due to the workers reacting to the sympathy and interest of the observers. He does say that this experiment is about testing overall effect, not testing factors separately. He also discusses it not really as an experimenter effect but as a management effect: how management can make workers perform differently because they feel differently. A lot to do with feeling free, not feeling supervised but more in control as a group. The experimental manipulations were important in convincing the workers to feel this way: that conditions were really different. The experiment was repeated with similar effects on mica-splitting workers (Mayo, 2019). Harry Braverman points out that the Hawthorne tests were based on industrial psychology and were investigating whether workers' performance could be predicted by pre-hire testing. The

Hawthorne study showed "that the performance of workers had little relation to ability and in fact often bore an inverse relation to test scores. He also argues that the studies really showed that the workplace was not "a system of bureaucratic formal organisation on the Weberian model, nor a system of informal group relations, as in the interpretation of Mayo and his followers but rather a system of power, of class antagonisms". This discovery was a blow to those hoping to apply the behavioral sciences to manipulate workers in the interest of management (atunterbahn.com). The economists Steven Levitt and John A. List long pursued without success a search for the base data of the original illumination experiments, before finding it in a microfilm at the University of Wisconsin in Milwaukee in 2011. Re-analysing it, they found slight evidence for the Hawthorn effect over the long-run, but in no way as drastic as suggested initially. This finding supported the analysis of an article by S R G Jones in 1992 examining the relay experiments. Despite the absence of evidence for the Hawthorne Effect in the original study, List has said that he remains confident that the effect is genuine (Levitt, 2011). It is also possible that the illumination experiments can be explained by a longitudinal learning effect. Parsons has declined to analyse the illumination experiments, on the grounds that they have not been properly published and so he cannot get at details, whereas he had extensive personal communication with Roethlisberger and Dickson (Parsons, 1974). Evaluation of the Hawthorne effect continues in the present day.

Recommendations

The Hawthorne effect is a phenomenon in simulation studies that should be taken seriously. Whenever dealing with human systems, consideration must be given to the methods in which data is gathered and models are validated. Otherwise, the Hawthorne effect can produce models based on invalid data or cause one to erroneously reject a valid model.

In testing for the Hawthorne effect the following guidelines can help:

- Compare observed times against logs, recollections, indirect measures or other sources of unbiased data.
- Validate the model (e.g., compare the simulation output with actual performance output). A valid model is an indication of valid input data. One should be careful to avoid the Hawthorne effect when observing actual system performance as part of the validation process.
- Be careful to avoid mistaking the Hawthorne effect for an increase in work pace due to legitimate factors.

Ways to mitigate the Hawthorne effect, whether during the data gathering phase or model validation phase of a simulation study include the following:

- Develop a rapport with workers being observed so they feel comfortable working at a normal pace.
- Assure workers that the purpose of the study is to improve the process, not pass judgment on worker performance.
- If practical, gather data over a long period of time to allow workers to settle into normal work patterns.
- If possible find way to gather data that is unobtrusive so that workers are una-ware of their being studied.
- If practical, gather data indirectly through automatic data capture or conferring with logs or other records that might be available.

Conclusion

There have been decades of debate over the Hawthorne studies and the true meaning of the Hawthorne effect. Through live researcher experience on this project the early indications suggest that the Hawthorne effect does exist and remains a key challenge that a participant observer must overcome. The most important stages to reach in order to overcome this challenge are to build a good relationship with the surrounding participants and to ensure they are relaxed in your presence. A signal that the surrounding participant is completely relaxed in your company is often ajoke or light-hearted comment. Through a case study example, it has been shown that the observer's subject eventually reveals behaviour which would not ordinarily be observed before establishing rapport. Despite being in a confrontational industry, this protocol will ensure further behavioural safety research can be conducted in a more robust manner, providing a better platform upon which interpretations can be made.

REFERENCES

"Scientific Myths That Are Too Good to Die". (Available at https://www.nytimes.com, accessed on 07/03/2019)

Adair J.G. The Hawthorne Effect: A reconsideration of the methodological artifact. *Journal of Applied Psychology* 1984;69 (2): 334–345.

Barnes BR. The Hawthorne Effect in community trials in developing countries. International Journal of Social Research Methodology 2009:1-14.

Cass EL, Zimmer FG. Man and Work in Society: A Report on the Symposium Held on the Occasion of the 50th Anniversary of the Original Hawthorne Studies, Oakbrook, Illinois, November 10-13, 1974. Van Nostrand Reinhold Company; New York: 1975.

Harrell CR, Gladwin B, Hoag MP. Mitigating the "Hawthorne effect" in simulation studies (Available at https://www.researchgate.net/publication/269329354_Mitigating_the_Hawthorne_effect_in_simulation_studies, accessed on 01/03/2019)

Hawthorne effect (Available at https://corporatefinanceinstitute.com, accessed on 03/03/2019)

Hawthorne Effect (Available at https://explorable.com, accessed on 08/03/2019)

Hawthorne effect (Available atunterbahn.com, accessed on 10/03/2019)

Hawthorne studies (Availabe at https://ebrary.net/2915/management/hawthorne_studies, accessed on 06/03/2019)

Levitt S D, List JA. "Was There Really a Hawthorne Effect at the Hawthorne Plant? An Analysis of the Original Illumination Experiments". American Economic Journal: Applied Economics 2011;3 (1): 224–238.

Mayo E. The Hawthorne Experiments thinker (Available at https://www.bl.uk, accessed on 09/03/2019)

Parsons H M. "What happened at Hawthorne?: New evidence suggests the Hawthorne effect resulted from operant reinforcement contingencies". Science 1974; 183(4128): 922–932.

Sedgwick P, Greenwood N. Understanding the Hawthorne effect. BMJ 2015:1-3.

Unraveling the Hawthorne Effect: An Experimental Artifact 'Too Good to Die' (Available at https://wesscholar.esleyan.edu, accessed on 07/03/2019)

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