



# 4 Productivity Experiments That Changed Attitude at the Workplace

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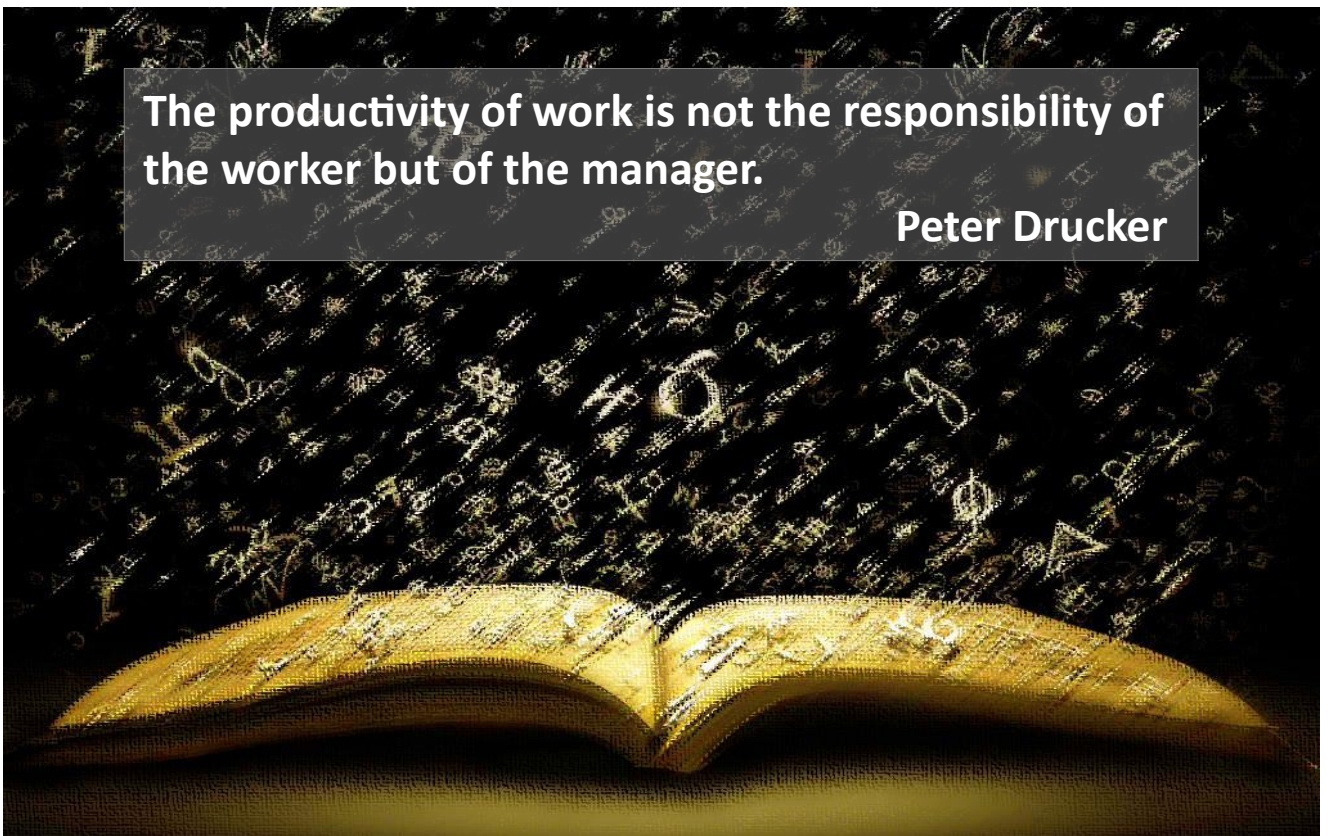
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**The productivity of work is not the responsibility of the worker but of the manager.**

**Peter Drucker**



# Introduction

Whether you're a business owner, a manager or a worker, the issue of productivity is central to your work.

If for one reason or another you take it as a sword of Damocles hanging over your head, then you're probably approaching it from a different perspective.

The purpose of this eBook is to tell you about 4 productivity experiments conducted throughout the 20<sup>th</sup> century as well as about the interpretation of the findings. You will see how researchers at different times were seeing productivity and its factors; how in the course of those tests it was found out that eventually people are the most important success factor for any organization.

One of the best ways for us to see deeper into the matter of productivity is through experiments: they enable us to see what things had been like before and what they've become after performing certain actions.

The knowledge accumulated by previous generations is a great source of inspiration and motivation for us – we should really use it, not ignore it. We genuinely hope you are able to apply this data for the benefit of your own organization.



## Chapter 1

# Frederick Taylor's Experiment with Pig Iron: A Springboard for Scientific Management

Beginning of the 20th century was a time when either business owners or managers started realizing significant research on productivity was very much needed. Since economic and social background was rapidly changing, it was important to understand what could bring more profits already in the short term.

In 1911 *The Principles of Scientific Management*, a research conducted by Frederick W. Taylor, was published. The book made a profound impact on what is now called management (in fact, it has given it a real, scientific start). We now refer to him as to one of the founding fathers of management.

In this chapter we will focus on the experiment with pig iron conducted by Taylor during his work at the steel factory, as it provides us with a great understanding on the nature of productivity.

## Major Problems Affecting Productivity

Being an engineer, Taylor had the perfect insight into how work was being done by ordinary workers. In his research Taylor had outlined what decreased productivity most of all:



- workers' negligence;
- low safety standards at production which led to numerous injuries;
- **soldiering** (workers purposefully working below their abilities as a response to low wages, fear to lose the job and rule of thumb method).
- poor work organization and distribution of resources.

## Experiment with Pig Iron

While working for Midvale Steel Company, Taylor needed to find ways to make workers operate faster and better. In his experiment with pig iron, he decided to research whether it was possible to make them move 47 tons of pig iron instead of 12 ½ tons. It was, as it later turned out.

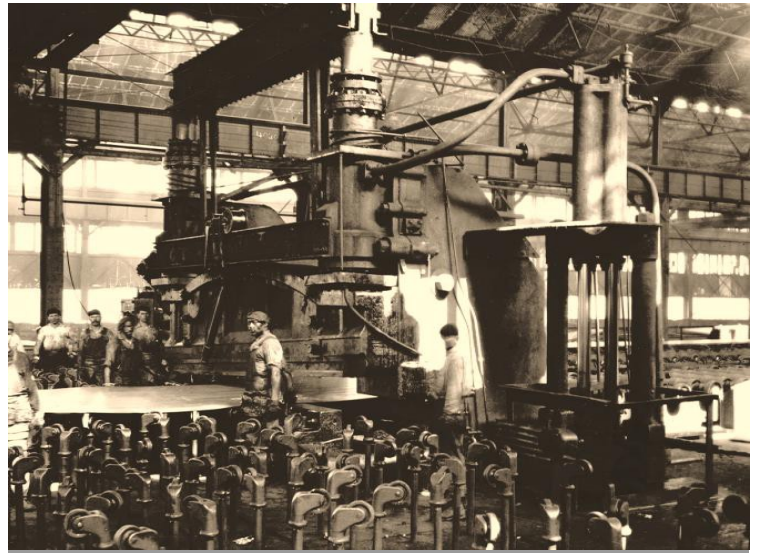
So what did Taylor do? First of all, he selected a certain amount of physically fit, enduring men who had strength enough to work more. In fact, he found out that only about 12,5% of men already employed were really fit to work in the steel industry.

Second of all, he ordered these men to follow instructions of their supervisors precisely, no matter how strange they could have seemed – have short rest during the day, sit down for a while, distract from work, etc. (at that time workers could hardly take frequent breaks or go for a stroll so these orders seemed really strange to them).

Next, Taylor divided the work into several operations and tracked exact time needed to perform them. Average rates for the whole industry were

defined and workers wishing to keep their jobs were obliged to follow them.

Taylor also found out that if workers were left to decide how they could organize their work on their own, they failed to perform better. On the contrary, if supervisors kept an eye on the work / rest ratio, laborers could lift 47 tons a day without tiring. Such system proved that what was previously done by 500 workers could instead be done by 140.



## Workers' Collective Image or Who Was Schmidt?



To personalize his research and make its results more illustrative, Taylor often referred to a man called Schmidt. Being fond of using parables in his studies, he tried to describe a typical worker of the then steel industry.

Schmidt, an embodiment of rough, uneducated men doing hard work every day, was a perfect prototype to get a better insight into why productivity was low and what could motivate the ordinary worker to do more.

There was indeed no man called Schmidt of course. However, this metaphor enabled Taylor to make an important generalization – the most important motivator for such man was money and through material reward it was possible to make him work better.

## Results of the Experiment

Taylor concluded from the experiment with pig iron:

- it's absolutely necessary that only workers really capable of performing each specific task were employed;
- rule of thumb had to be substituted with a much more effective method – material reward;
- workers should be allowed enough rest and better work conditions.

Generally this meant that:

- productivity of labor could be increased by 3 to 4 times;
- wages for the remaining, capable workers could be 60% higher.

Taylor's fundamental research enabled managers to finally assess performance and productivity on scientific grounds, with less guesswork and more facts. In fact, we still continue to benefit from it even today.

## Chapter 2

# Research on Productivity and Its Factors In The Hawthorne Experiments

Between 1927 and 1932, Western Electric Company's Hawthorne Works (Chicago, US) was a place where important research was being conducted. Since 1928 in charge of it was Elton Mayo, professor at HBS.

Initially the tests were aimed at studying the impact of light on productivity. Later, Mayo shifted the focus on group behavior and social interactions between workers. These were the first large-scope tests on how different work conditions and socializing affected productivity (later called the Hawthorne experiments).

### Illumination Experiment

The 1st experiment was aimed at finding out whether there was any correlation between light and productivity (not to mention the fact what it would mean to electricity companies if the research proved the benefits of artificial lighting in work areas).

It was decided to place a group of workers into two separate rooms. In the first one lighting was increased which supposedly had to increase productivity as well. On the contrary, in the second room lighting was decreased and so was expected of productivity. However, the results showed clearly that there was no direct correlation between these variables. In fact, what influenced productivity more were comfortable working conditions.

Mayo decided to launch his studies in the newly discovered areas and the Hawthorne experiments were continued.



### Relay Assembly Tests

Mayo decided to figure out how routine and fatigue affected productivity and to a what degree one might change them to achieve the best results. So variables such as the amount of working hours, breaks, temperature and humidity in the rooms were specified. It was planned to change them periodically and observe the produced effect.

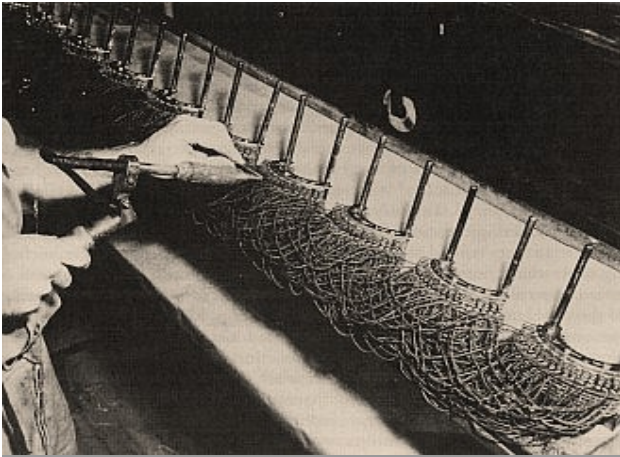
To do this Mayo chose 6 women and located them in a separate room. At the same time he ordered their supervisors to behave in a friendly and easy-going manner (which was quite different from their usual behavior).

Extensive and complex data was collected. The test showed that even small improvements in work conditions (e.g., two 5 minutes breaks or daily hot meals provided by the company free of charge) were crucial to the workers' better performance.

However, the further the researchers proceeded in their study, the more obvious it was becoming that it was nearly impossible to really calculate the impact of different factors on productivity. In fact, all the variables mentioned above constituted just a tiny portion of it. Every time researchers focused on certain factors it was turning out they were not crucial and there's always something more.

The 2nd experiment eventually revealed it was a human factor that was really important. Mayo, at first puzzled with the results, decided then to proceed to a new stage of research. His decision laid the foundations of what we now call HR management.

## Bank-wiring Experiment



The final test was conducted to study social interactions within a group of male workers performing dull, routine work of wiring banks. Important conclusions on the group behavior were made.

Whom of their colleagues do you think workers respected most of all? The hard-working and focused colleagues? Or sociable, easy-going ones?

For workers involved into the experiment it was simpler than that: the main criterion was just to disagree with supervisors

and work slower than usual (we meet the same occurring in Taylor's tests – he called it soldiering).

That alone was decreasing productivity more than light, humidity and changing work rhythm taken together.

It then became clear that workers paid more attention to socializing, and therefore salary was not the sole motivator. In fact, groups within the group had a major influence on the performance.

Further tests in the group of women also confirmed that remarkable results could be achieved if they were allowed little chats during work; if supervisors encouraged informal communication instead of rigid hierarchy and subordination. Comfortable social atmosphere within the group actually led to its becoming a team.

## Hawthorne Effect



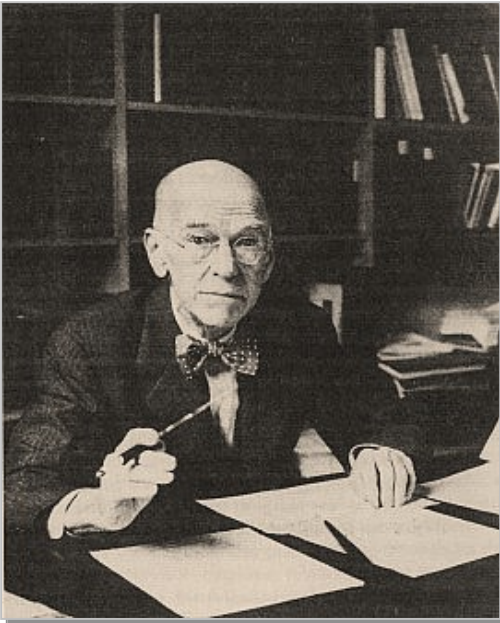
During the continuing studies researchers found out that all factors they thought to be crucial were in reality much less important. As those factors were gradually eliminated they came to a conclusion now known as the Hawthorne effect – social incentives were stronger than material and physical conditions of work (provided that work had already been organized effectively).



To put it simply, if workers could fulfill not only their material needs but social ones as well (especially belongingness needs) they became more responsible, hard-working and supportive. A strong, motivated team could then emerge.

In the 1950s Henry Landsberger reformulated the Hawthorne effect. We now also refer to it when saying that people tend to work better if they are aware of being involved in the experiment and being observed. More generally, they change their behavior in response to the attention from outside.

The Hawthorne experiments and Mayo's personal observations meant a significant progress in completely reassessing the role of human factor for any company. It eventually led everyone to realize that people are the main asset of any organization.



“One friend, one person who is truly understanding, who takes the trouble to listen to us as we consider our problems, can change our whole outlook on the work.”  
Elton Mayo

## Chapter 3

# High Expectations and Their Impact on People: the Pygmalion Effect



Have you ever noticed that you might act differently depending on what is expected of you? Similarly, how we perceive others can determine how they act. As a matter of fact, it's the most natural behavior since expectations are a very potent tool in influencing people and stimulating them to perform desired actions.

In fact, the way we perceive reality can actually influence and alter it. This is the basic concept of the self-fulfilling prophecy, a psychological phenomenon that explains the impact of expectations on us. To put it simply, people are very likely to behave in accordance with our expectations regarding them.

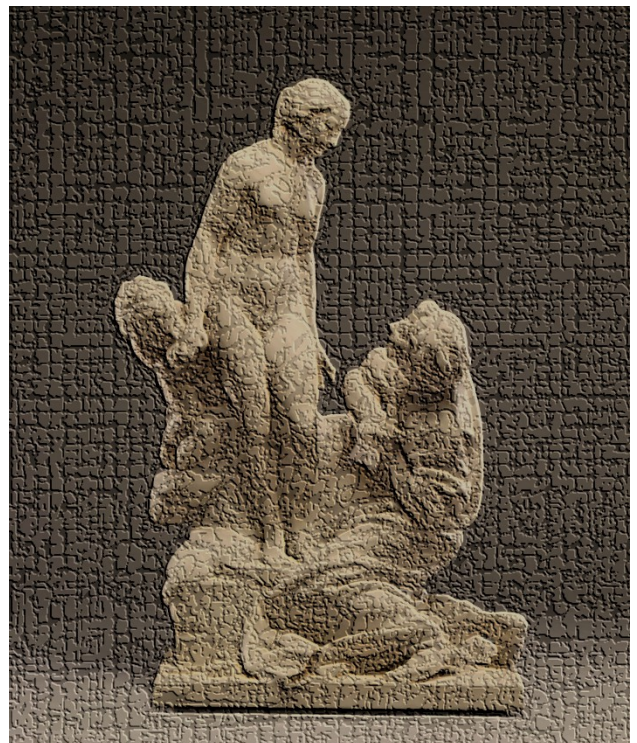
SFP is actually a double-edged sword. Its positive form is called the Pygmalion effect while the negative is referred to as the Golem effect. In this chapter we will focus on the first one and will try to understand how exactly it's influencing our motivation and performance.

## Origins

The first experiment on SFP was conducted by Rosenthal and Jacobson in 1968. It studied how teachers' expectations affected educational achievements of their students and was later called "Pygmalion in the Classroom".

Why Pygmalion? Greek mythology tells us Pygmalion was a sculptor who carved a beautiful ivory statue and then fell in love with her so desperately that Aphrodite took pity on him and turned the statue into a live woman.

Rosenthal thus decided to use the myth as an analogy with his own research meaning that if we want something to happen very much it's quite likely to happen after all.



Further tests were conducted by researchers in the other areas (industry and the military) to study whether the effect applied to people with different backgrounds.

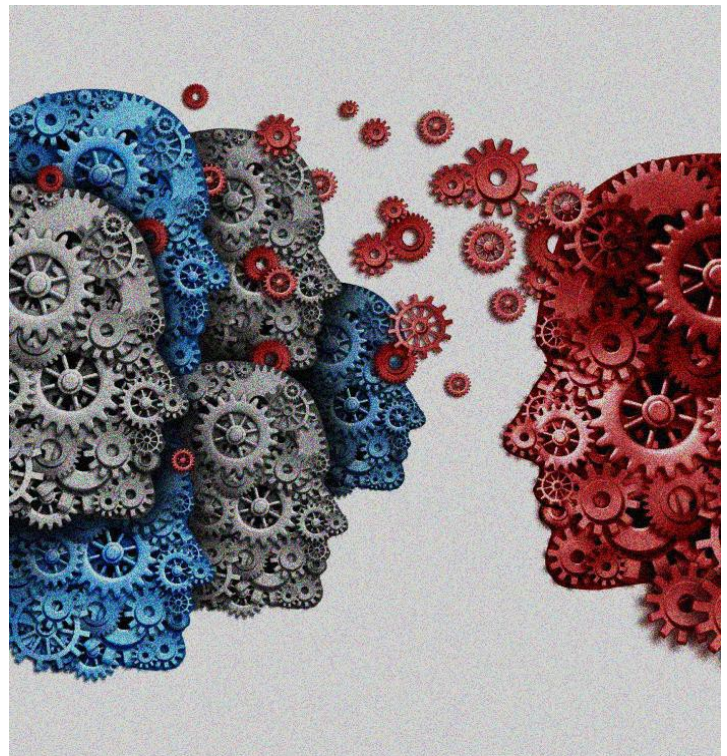
In this chapter we will concentrate on the tests conducted in the Israeli army as they provide the most complex and inclusive information on the positive form of SFP.

## The Combat Training Experiment

This was the 1st test in the Israel Defence Forces. The research question was to find out whether expectations did affect performance and, if yes, how exactly.

A group of 105 men was selected for the combat experiment and 4 supervisors were assigned. The latter were told that trainees had been divided into groups each consisting of soldiers with different potential – high, average and low. In reality, all men were of the same abilities. During the further training supervisors were already affected by the so-called perception biases.

In the following training it turned out different groups under command of different supervisors showed different results.



Trainees of whom high, average and low performance was expected showed best, average and low results respectively. However, that was not the main surprise of the experiment.

The Pygmalion effect on supervisors rather than subordinates turned out to be far more interesting. What happened was that supervisors demonstrated quality leadership towards trainees they thought were the best which in turn promoted better performance. **The Pygmalion effect in this case is therefore a leadership phenomenon.**

Trainees within the same group reported that they were treated differently by the same supervisors. The ones of whom the best results were expected actually produced them and vice versa. It became clear that supervisors could be simultaneously good and bad leaders – it just depended on whom to. The best leadership is derived directly from high expectations.

## The IDF Adjutancy Experiments

The previous test provided us with data on how raised expectations impacted supervisors – they managed their staff better. But what did subordinates themselves think about it? A new experiment was conducted which resulted in revealing the so-called Galatea effect.



After a short interview with each trainee, researchers remarked that they thought high of the trainee's abilities. They then had no contact with the soldier (as opposed to the previous case when supervisor was present at training all the time).

What resulted from this was that high expectations communicated by others led to high self-expectations. In the course of the experiment all trainees to whom high expectations were announced produced better results, demonstrating greater motivation and involvement and believing strongly in their own abilities.

The most important conclusion resulting from this case was that the managers belief in their staff's abilities is a very important but not the sole factor of better performance. What subordinates thought of themselves was equally important, if not more.

## The Difference Between the Pygmalion Effect and the Galatea Effect

Briefly speaking, if a man acts better because he expects himself to do so, it's the Galatea effect. Therefore it is the man himself who fulfills the prophecy while the Pygmalion effect means the supervisor / manager does.

### The IDF Squad Experiment

The 1st experiment involved a group which consisted of trainees with different potential (so the supervisors were told). They differentiated trainees within their group.

The aim of the 3rd experiment was to investigate whether the Pygmalion effect applied to a group as a whole.

In the course of this experiment leaders of groups were summoned to their military psychologist before meeting new trainees.



The aim of those conversations was to raise the leaders expectations towards their teams. Some of the leaders were told about the high potential of every trainee in their group while to the others no data regarding trainee potential was given.

The leaders were divided into 2 groups: those with certain expectations towards soldiers and those without.

The results of the test showed the former leaders and their team produced much better results than the latter.

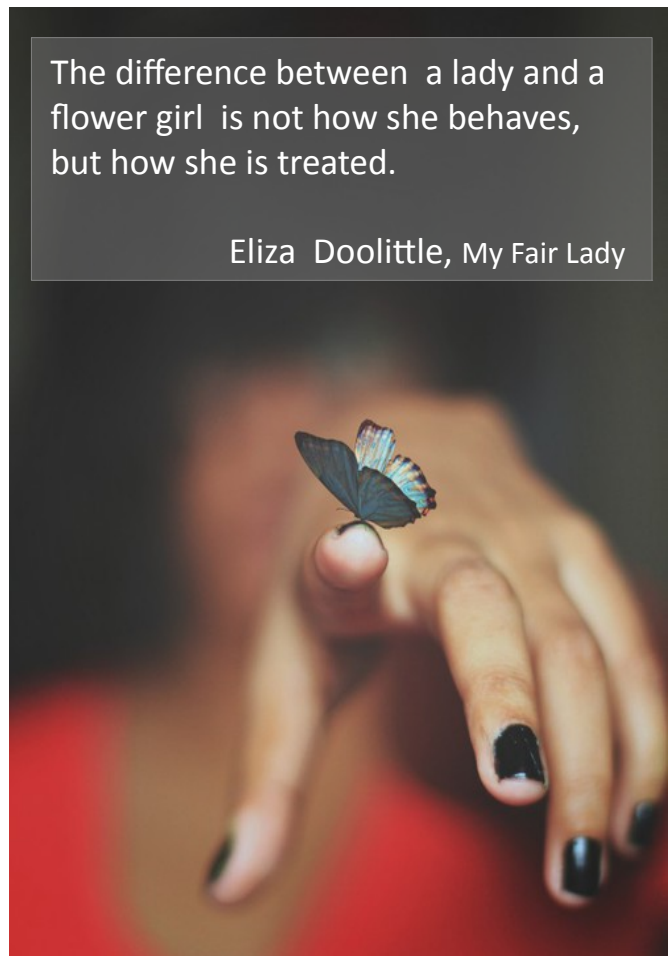
From this we can draw a very important conclusion: the Pygmalion effect is not exclusively individual and better results of people are not achieved at the expense of others (of whom little is expected). Rather, it can be a collective phenomenon providing that leaders expect about the same of every team member.

## Act Differently

Now that we know the results of these tests it becomes instantly clear any organization should be interested in fostering the Pygmalion leadership style. Managers will be in charge of staff they expect, not “deserve” – high expectations lead to quality management that in turn leads to better performance.

The difference between a lady and a flower girl is not how she behaves, but how she is treated.

Eliza Doolittle, My Fair Lady



## Chapter 4

# The Golem Effect or How Low Expectations Can Ruin Our Motivation

As we mentioned in the previous chapter, SFP has two sides. The negative, darker one is called the Golem effect and it's totally opposite to the Pygmalion effect.

## Origins

According to the old Jewish legend Golem was a creature that had to fight evil (Golem is a Hebrew jargon for “dumbbell”). However, it quickly turned into a monster because of a devastating impact of its excess power. The Golem effect is meant to describe people who create obstacles from within or who cannot overcome negative outside attitudes towards them.

The Golem effect is not so well studied as its counterpart. This is due partly to ethical considerations (is it acceptable to influence a person with low expectations?).



The effect is also automatically taken by many as the opposite to the Pygmalion effect and conclusions on its impact are primarily based on the research of the Pygmalion style (in particular, the one conducted in the Israel Defence Forces).

We will therefore try to focus on the main question concerning the Golem effect: how exactly can managers express low expectations towards their subordinates (often unconsciously)?



## How Do Managers Treat Their Subordinates?

One of the studies in this field confirmed that managers do divide their staff. They view “weaker” employees as less inspired, motivated and innovative and more passive and inclined to perform centralized tasks at the same time. Generally speaking, they are less likely to produce effective solutions but more likely to cause problems instead.

Managers from the study have also confirmed they treated “stronger” and “weaker” employees differently – they encouraged, engaged and communicated with the first ones and just gave orders to the latter.

## In- and Out-Groups

Another interesting conclusion from that research made it clear the majority of managers perceived “stronger” performers as belonging to their “in-group” while “weaker” ones were left outside – in the “out-group”. Apparently, the “in-group” received greater support and was involved in the decision-making. On the contrary, relations with the “out-group” were formal and hierarchical.

It’s really hard to find another way to mentally destroy the team so quickly as in the case of in- and out-groups. Dividing staff into stronger and weaker is not good but inevitable. However, bringing it out into the open is a hundred times worse – here’s exactly when the Golem effect stands out. The moment an employee senses low expectations and disregard on the part of the manager they start lacking energy and motivation to work better.

## Three Properties the Golem Effect Deprives People of

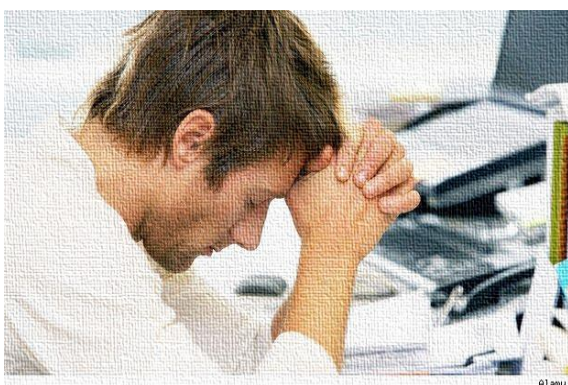
Managers with low expectations towards their subordinates cannot count on the latter feeling:

- competent;
- autonomous;
- respected and prized as individuals.

## How Do Subordinates Feel About Low Expectations?

It’s actually a rhetoric question – people sensing disregard constantly can hardly feel overexcited at the prospect of even attending work, not to mention working productively. However, we still need a deeper insight into their behavior. This is how the Golem effect manifests itself:

1. **Less space.** Instead of encouraging greater involvement of subordinates into decision-making, managers set up tasks with rigid instructions of how to do them (thus leaving no room for initiative).



2. **Too much advice.** While leaving workers with little choice of how they can perform their task, managers also tend to check and re-check everything the latter are doing. It does not contribute to boosting confidence very much (not to mention that employees rarely receives really valuable advice but rather annoying re-asking instead).



3. **Demonstration of the manager's authority.** When discussing certain matters with subordinates managers leave them little chance to make suggestions. They instead made it clear (or hint) that it'd be better to do things their way. Even if allowing subordinate to do something as they is right they eventually don't hesitate to show that eventually it was a bad idea. Employee then choose to behave how they are told since it's the only way to avoid criticism.

4. **Ignored ideas.** If seeing no reaction on the part of a manager in response to their ideas, employees think it better not to waste time and effort since it'd be ignored anyway. At the same time, seeing greater attention to the "in-group" demotivates them even stronger.

5. **Harsh communication.** While the higher performers are welcomed to extensive conversations, interaction with the lower ones reminds them of an interrogation: "Did you do it?", "Why not?", "When then?", "No time for arguing, just do it asap". Little wonder then, if employees expect tricky questions and reproaches every time the boss enters the room.



7. **Not noticing success.** Being highly selective about praising staff (in fact, acknowledging only the "in-group") is an awful mistake which most employees find very hard to forget. The feeling of "No matter how hard I tried and what I've achieved they're just not seeing it" is a reason for bitter disappointment and reluctance to work better.

We know see that the Golem effect brings out literally the worst in both managers and staff. It therefore has to be avoided by any means.

To conclude, managers should strongly be aware of the behavioral patterns described above – it's a sure way to spoil things before even starting. It also leaves the question: "Who is a real failure here?" open.



Thanks for reading

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