

# A Structural Equation Model on Relationship Between Workers' Performance and Their Five Factor Personality in The Case of Downward Social Comparison

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## Abstract

There is a wide variety of assembly tasks in manufacturing industries, the performance of workers depends largely on their aptitude. In order to improve workers' performance, some factories have applied social comparison theory to prompt workers to compete against each other so as to raise workers' motivation towards assembly tasks. In our previous study, we designed a laboratory experiment of cell production to investigate the effect of competition among workers. Based on the experiment result from 72 workers, we have clarified that the work efficiency could be increased by averagely 20% through announcing the workers with the shortest and the longest assembly time, as well as the rank for each worker every 15 to 20 minutes. We have further clarified that the comparison direction has significant influence on the workers' performance, and the downward comparison could improve the work efficiency by about 2% compared with the upward comparison.

As there is a lack of researches on the effect of social comparison on workers' performance for assembly tasks, this study intends to fill this gap in the literature through clarifying the psychological mechanism of how workers' personality and social comparison orientation affect their performance in the case of downward social comparison, and making the following contributions:

- (1) This study design and conduct an experiment of assembly operations and use the assembly time to quantitatively measure a worker's performance. This is different from most previous research that applied questionnaire survey or case study methods to assess work performance subjectively.
- (2) Although many companies have applied social comparison theory to prompt workers to compete against each other and realized empirically that the social comparison can improve workers' performance, almost all of them conduct social comparisons according to the supervisors' experience or intuition, there is no research published to consider the best utilization of social comparisons. This paper is the first attempt to examine how workers' personality affect their performance in the case of downward social comparison, and provide some key points to conduct social comparisons more effectively.
- (3) This study applies Five Factor Personality Questionnaire (FFPQ) scores to measure workers' personality and uses the Iowa-Netherlands Comparison Orientation Measure (INCOM) to measure the social comparison orientation of workers. Then, we build a structural equation model, and places our emphasis on clarifying the psychological mechanism of how workers' personality and social comparison orientation affect their performance.

## Keywords

Workers' Aptitude, Social Comparison, Structural Equation Model, Five Factor Personality Questionnaire (FFPQ)

### **Acknowledgement**

This work was supported by JSPS KAKENHI Grant Number JP20K01818.

### **Biographies**

**Yanwen Dong** is a professor in the cluster of science and technology at Fukushima University. He received his bachelor degree in 1982 and a master degree in 1984 from University of Science and Technology Beijing, China. He also received PhD in 1996 from the Osaka Prefecture University, Japan. He worked in University of Science and Technology Beijing as a lecture from 1984 to 1995 and in Faculty of Economics, Fukushima University as an associate professor from 1997 to 2004. His current research interests include cell production system, production scheduling, data mining and management information system.

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