Happiness Makes Workers More Productive:

Evidence from Large-Scaled Experiments

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Abstract

There is an increasing interest among firms in investing in the happiness of their employees. However, the empirical evidence of the causal relationship between happiness and productivity is limited (Oswald et al., 2015; Bellet et al., 2020). Therefore, we conducted two different styles of large-scaled experiments which exogenously provide the variation in the level of happiness among employees and civil servants in Japan (n=6,201) to test the causal relationship. The first experiment is a Randomized Controlled Trial (RCT) showing a comedy clip to the treatment group while showing a control clip of moving shapes to the control group to test if the raised happiness induced by the comedy clip makes participants more productive. The second experiment is a natural experiment exploiting exogenous real-life negative shocks on happiness (death or serious illness of the spouse) to test if the lowered happiness caused by the shocks lowers productivity. The productivity of each participant is measured by the number of correct answers of timed mathematical additions that participants solve for monetary incentives after watching a comedy/control clip. Both experiment results support the causal relationship of happiness raising the productivity of workers.

Keywords**:** Happiness; Productivity; Randomized Controlled Trial

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1. Introduction

There is an increasing interest among firms in investing in the happiness of their employees, but most of the empirical studies on the relationship between happiness and productivity are correlational studies and the causal evidence is scarce. Exceptions are Oswald et al. (2015) and Bellet et al. (2020). However, since the sample characteristics are limited in both of these studies, further empirical studies are necessary to provide externality to the causal relationship between happiness and productivity.

Therefore, we conduct two different styles of large-scaled experiments which exogenously provide the variation in the level of happiness among employees of firms and civil servants in Japan (n=6,201) to test the causal relationship applying the laboratory experiments conducted by Oswald et al. (2015). The first experiment is a Randomized Controlled Trial (RCT) showing a comedy clip to the treatment group while showing a control clip of moving shapes to the control group to test if the raised happiness induced by the comedy clip makes participants more productive. The second experiment exploits exogenous real-life negative shocks on happiness (death or serious illness of the spouse) to test if the lowered happiness caused by the shocks lowers productivity. The productivity of each participant is measured by the number of correct answers of timed mathematical additions that participants solve for monetary incentives after watching a comedy/control clip. We find that both experiment results support the causal relationship of happiness raising the productivity of workers.

The rest of the paper is organized as follows. Section 2 explains our research design to examine the impact of happiness on productivity. Section 3 present the empirical results of two types of the experiments and Section 4 contains concluding remarks on our findings.

2. Research Design

2.1 General Information of the Data

Our original data is obtained by a carefully designed web survey containing Randomized Controlled Trial (RCT), conducted in March 2019. Sample size is 6,201. Out of 6,201 participants, information on 4,568 are used for analysis to avoid rough answers attributing from the nature of the web survey. All the participants are living in Japan and employees of firms or civil servants among the monitor members of Cross Marketing Inc. Gender, age and regional distributions of the sample are adjusted to their distributions of the Japan Census 2015.

2.2 Experiment 1

The first experiment included in the survey is an RCT testing the impact of positive

emotion on productivity using a mood induction by a one-minute comedy clip. The experiment consists of five steps. First, all the participants answer questions to measure the original level of positive emotion. Second, participants are randomly divided into a treatment group or a control group and those who are in the treatment group watch a one-minute comedy clip while those who are in the control group watch a one-minute control clip showing moving shapes. Third, all the participants answer questions to measure the level of positive emotion again to check the impact of the clip on their levels of positive emotion. Finally, all the participants solve mathematical additions for three minutes for monetary incentives, where the number of correct answers is used for analysis as a measure of productivity (*PR*) of each participant.

To measure the level of positive emotion before and after the treatment, we employ the Japanese version of "Brief, Momentary Mood Checklists (BMMC)" (Thomas, D. L., & Diener, E., 1990 ; Tanaka, 2008) following (Kurokawa et al., 2014). BMMC uses four positive words (happy, joyful, pleased, enjoyment/fun) and five negative words (depressed/blue, unhappy, frustrated, angry/hostile, worried). Participants rate the degree to which he/she is experiencing with a 7-point scale ranging from 0 (not at all) to 6 extremely much) to each of nine words. We define the sum of the four positive words' scores before watching the clip as *PE (before)* and the sum after watching the clip as *PE (after)*.

2.3 Experiment 2

While the first experiment tests the impacts of the short-term mood induction on productivity, the second experiment tests the impact of relatively long-term happiness status on productivity exploiting the real-life negative shocks on happiness. We define the negative shocks as the death of the spouse within a past year and the current serious illness of the spouse, and define a variable *Sad event* taking one when one has experienced either of the negative shocks. The level of happiness (*Happiness*) is measured with 11-point scale general happiness question (11: Very happy…1: Miserable). We use *PR* as a productivity variable same as the analysis of the first experiment.

Though this second experiment is not an RCT, the negative shocks captured as *Sad event* are unintended natural events in most of the cases as Oswald et al. (2015) explains. Therefore, it can be considered as a natural experiment. The exogeneity of *Sad event* would be more plausible after controlling for age, sex, one's health status, income, and ability.

3. Results

3.1 Experiment 1
First, we checked if the randomization of the treatment is successful with a balancing test

and made sure that our randomization can be considered quite successful. Second, we test if the treatment (the comedy clip) raised the *PE* of the participants. Unfortunately, the treatment was not successful in raising *PE* for overall participants. We attribute this from the well-known cultural difference in the sense of humor (Ura, 2018; Senuma, 2015) and further searched for the areas where the treatment was affective. As a result, we found that the treatment successfully raised happiness only among those who live in Tokyo so that further investigated the impact of the treatment on productivity only using the information of those who live in Tokyo (n=494). Since we use the sub sample (participants from Tokyo) for analysis because of the heterogenous treatment effect depending on prefectures, we conducted a balancing test only using the information of participants from Tokyo and made sure that randomization is successful in the sub sample as well.

Figure 1 (a) indicates that *PE (after)* of the treatment group is higher than that of the control group. OLS regression results regressing *PE (after)* on *Treatment* with/without control variables (age, sex, one's health status, income, and ability) verify that the treatment significantly raised *PE* of participants from Tokyo as well. As to the impact of the treatment on productivity (*PR*), we can see in Figure 1 (b) that *PR* of the treatment group is higher than that of the control group. OLS regression results of regressing *PR* on *Treatment* with/without control variables confirm that *PR* of the treatment group is significantly higher than that of the control group as well. According to the OLS estimation, the treatment raised *PR* 4.5 to 6.0 point. Considering that the mean of *PR* of the control group among participants from Tokyo is 52, our results show that the treatment raised productivity about 9 to 12 percent. In addition, using *Treatment* as an instrument variable, we conduct the Two Stage Least Squares (2SLS) estimation. The 2SLS estimation result also supports the significant influence of the endogenous variable *PE (after)* on *PR*.

3.2 Experiment 2

As to the second experiment, using all the available sample (n=4,578), we first test if those who have experienced the sad events (spousal bereavement within a past year or serious illness of the spouse) show lower level of happiness or not. As shown in Figure 2 (a), though those who are not married show the lowest level of happiness, those who have experienced the sad events show lower level of happiness than those who are married and have not experienced the sad events. OLS regression results regressing *Happiness* on *Sad event* with/without control variables confirm that those who have experienced the sad events have significantly lower level of happiness.

As to the impact of the sad events on *PR*, we can see in Figure 2 (b) that *PR* of those who have experienced the sad events is lower than those who are not married or those who are

married and have not experienced the sad events. OLS regression results of regressing *PR* on *Sad event* with/without control variables confirm that *PR* of those who have experienced the sad events is significantly lower than that of other people. Point estimates of the OLS regression show that sad events lowers 6 to 9 point of *PR*. Considering that the mean of *PR* among those who are married and have not experienced the sad events is 53, our results show that the sad events lower productivity about 11 to 17 percent. Furthermore, using *Sad event* as an instrument variable, we estimate the 2SLS model, which supports the significant influence of the endogenous variable *Happiness* on *PR*.

4. Conclusion

Our study provides a causal evidence that happiness raises productivity of workers. To our knowledge, this is the first study providing a causal evidence of happiness raising productivity among workers using an RCT. Our RCT results show that the positive emotion induced by a comedy clip raises productivity of those who live in Tokyo about 9 to 12 percent. Also, the natural experiment results show that sad events (spousal bereavement or serious illness of the spouse) lower productivity of workers about 11 to 17 percent. The estimated magnitudes of the treatment and life shocks are consistent with the findings from Oswald et al. (2015) even though backgrounds of participants are different. Our study has the real-world contributions providing evidence that investments on the happiness of employees can be beneficial for firms since it improves their productivity.

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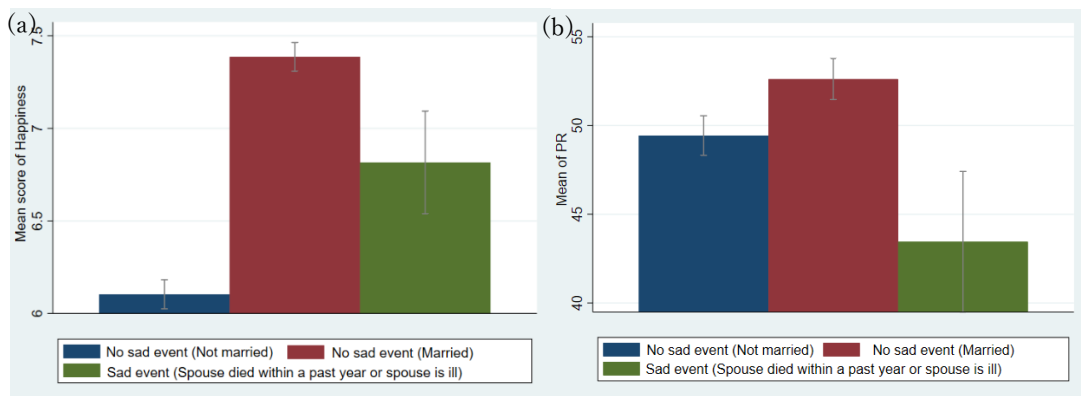
Figures

Figure 1. Treatment Effect on Positive Emotion (*PE*) and Productivity in Tokyo
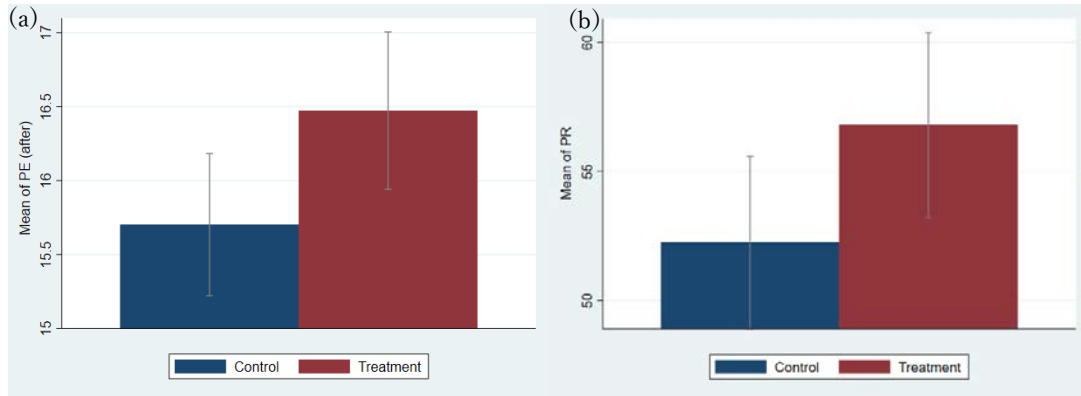
Notes: N=494. 90 % confidence intervals presented.

Figure 2. The Impact of *Sad event* on *Happiness* and Productivity (*PR*)

Notes: N=4,568. 90 % confidence intervals presented.