Lukewarm Feeling in Company X from 2004–2013

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Abstract: Japanese companies often criticize themselves on their own “nurumayu [lukewarm] nature”; however, in reality, according to Takahashi (1989), the lukewarm feeling felt by organization members can be explained through the effective temperature hypothesis. An organization’s propensity to change as a system is measured as system temperature, while a member’s propensity to change as an organization person is measured as body temperature. The lukewarm feeling felt by members can then be explained using effective temperature, which is defined as the system temperature minus the body temperature. This paper validates the effective temperature hypothesis using data from Survey X, an exhaustive survey of all employees of Japanese Company X, which is successful in organizational reform. The survey was carried out once a fiscal year, during the fiscal years 2004–2013. Like the results of the JPC Survey of Takahashi (2013), those of Survey X show the coefficient of determination of 0.9840

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A part of this paper was originally published as Takahashi, Ohkawa, and Inamizu (2009) in Japanese. The first submitted draft of this paper was based on survey data between 2004–2008 and later the dataset was updated to 2004–2013 through the review process.
with a surprisingly neat straight line, demonstrating a direct relationship wherein the lukewarm feeling ratio drops as the effective temperature rises.

Keywords: nurumayu, lukewarm feeling, thermometer, organizational climate, organizational culture, leading economic indicator

1. Introduction

The so-called “nurumayu [lukewarm] nature” of Japanese companies often tends to be viewed as a negative organizational climate or as a classic example of “inactivated state of organizations.” It is difficult to explain the “nurumayu nature” in English (Takahashi, 1992b). However, Takahashi (1989) successfully gives an explanation for it by testing the effective temperature hypothesis as a framework to explain the lukewarm feeling. The hypothesis is that effective temperature is defined as system temperature minus body temperature. Considered analogous to water temperature in a bathtub, system temperature means an organization’s propensity to change as a system. In the same way, body temperature indicates the degree of member’s propensity to change as an organization person.

Question:

Q1. Do you feel that the atmosphere at your work place is lukewarm (“nurumayu”)?

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1 Propensity to change of an agent also plays an important role in a multi-agent computer simulation model by Kuwashima, Takahashi, and Tamada (2005). Kondo (1992) uses the concepts of nurumayu and propensity to change when linking Takahashi (1992a) and Kawai’s (1992) theory on organizational activation to Axelrod’s (1984) theory on the evolution of cooperation.
Assuming that the lukewarm feeling ratio is the proportion of people who responded “yes” to the question (Q1), the effective temperature hypothesis can be expressed as follows.

**Effective Temperature Hypothesis**

Define the effective temperature ($T$) as follows:

\[ T = SINDEX - BINDEX. \]

Then the lukewarm feeling ratio of a group is in reverse proportion to its mean of the effective temperature.

The system temperature ($SINDEX$) and body temperature ($BINDEX$) here were measured as follows (Takahashi, 1997b), using the following questions.

**System Temperature:**
- S1. Have high performing individuals been consistently promoted and given raises? (1 = yes; 0 = no)
- S2. Is avoiding failure considered more important than improving performance through trial and error? (1 = no; 0 = yes)
- S3. Is the atmosphere one which welcomes challenging new jobs? (1 = yes; 0 = no)
- S4. Is adopting the corporate culture more important than developing your own individuality? (1 = no; 0 = yes)
- S5. Is the atmosphere a competitive one in which members strive to achieve their goals? (1 = yes; 0 = no)

**Body Temperature:**
- B1. Do you constantly seek improved ways of doing your jobs better than the others? (1 = yes; 0 = no)
- B2. Do you do your job in the way you want regardless of the way it was done in the past? (1 = yes; 0 = no)
- B3. Do you go out of your way to do new jobs before they are
assigned to other departments? (1 = yes; 0 = no)
B4. Do you believe you are able to cut your own way to success even in another company? (1 = yes; 0 = no)
B5. Do you obey the orders of your superiors even if you disagree with them? (1 = no; 0 = yes)

For these ten questions, the combined score for S1–S5 measured the system temperature (SINDEX), while that for B1–B5 measured the body temperature (BINDEX). The “Japan Productivity Center (JPC) Survey”\(^2\) gathered data over a period of 11 years (1990 to 2000) from 10,916 white-collar workers of 46 major Japanese companies involved in the JPC Academy of Management Development, with a response rate of 89.3%. Further examination of this data showed consistent accuracy of the effective temperature hypothesis (Takahashi, 2001, 2013). Accordingly, this paper examines the hypothesis on the basis of an annual comprehensive survey, Survey X.

2. A Test for Effective Temperature Hypothesis

Survey X is a survey for all employees of Company X in Japan, carried out once a fiscal year since 2004. The survey was conducted in October 2004, September 2005, and February from 2007 to 2014. The questionnaires were distributed to all members of the company at once and collected once filled, using a placement method. Out of the 13,383 questionnaires distributed in Company X through fiscal years 2004–2013, 13,230 were collected, giving a mean response rate of 98.9%.

We investigate the relationship between the lukewarm feeling ratio

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\(^2\) The JPC survey questionnaire included questions on body temperature and others, which made up approximately 50 and above questions each time. For example, Takahashi (1997a, 2002) and Ando (2002) also analyzed their studies on the basis of the JPC survey.
and the effective temperature. The respondents are divided into 11 groups: Effective temperature = −5, effective temperature = −4, and so on up to effective temperature = 5, and the lukewarm feeling ratio of each group is calculated. Figure 1 shows a comparison of this data with those of the JPC Survey for 10,536 workers in Takahashi (2013). Like the JPC Survey, Survey X also shows a linear relationship between the increase in effective temperature and the decrease in the lukewarm feeling ratio, thus validating the effective temperature hypothesis. However, only nine of the 10,536 JPC Survey respondents (0.09%) and 12 of the 12,983 Survey X respondents (0.09%) had an effective temperature of 5, meaning that the results for this group were less accurate and diverged further from the linear relationship. A regression analysis on the 10 points remaining after excluding the respondents with an effective temperature of 5

Figure 1. Effective temperature and lukewarm feeling ratio

Note: The red dashed line shows the JPC Survey data carried out between 1990 and 2000, where \( N = 10,536 \); the green line shows the Survey X data (2004–2013) where \( N = 12,983 \).
produces the straight regression lines given in Figure 1. The JPC Survey and the Survey X data resulted in a surprisingly high coefficient of determination; 0.9886 for JPC Survey and 0.9840 for Survey X.

The regression line given by the JPC Survey data shows a relationship wherein the lukewarm feeling ratio decreases by around 6.5% each time the effective temperature increases by 1, with a lukewarm feeling ratio of around 50% between effective temperatures 1 and 2. Although the Survey X data shows little difference in the incline of the line, there is an overall downward shift of around 10%, with a lukewarm feeling ratio of around 50% between effective temperatures of −1 and 0. In other words, the lukewarm feeling ratio of the Survey X respondents was lower by 10 percentage points than that of the JPC Survey respondents.

3. Tracing Organizational Change by Lukewarm Feelings

One possible reason why the lukewarm feeling ratio of every effective temperature group of the Survey X respondents is 10 points lower than that of the corresponding group of the JPC Survey respondents could be a major organizational reform in Company X. The most dramatic change during the ten-year duration of Survey X (2004–2013) was the restructuring of the company from 2005 to 2006. This restructuring was so immense that the offices throughout the country were consolidated into one-third of the original number; the workers whose offices had closed down had to transfer to another region to continue working for the company. The company called for voluntary retirements at the end of August 2005; almost 20% of all the employees declared their intention to retire, many more than anticipated. This meant that by the time the new system was launched in April 2006, the company had to fill the vacancies, which was around half as many as those who had retired. Survey X was
conducted ten times, with the first survey taken in October 2004. The next survey was taken in September 2005, soon after the applications for voluntary retirement had closed. The third survey was taken in February 2007, almost one year after Company X had hired a large number of new employees and the new system had been launched. Consequently, the first three surveys captured data from before, during, and after this major restructuring, providing the perfect opportunity to measure the effect of major restructuring on an organization.

As Takahashi (1997b, 2003, 2013) has pointed out, the lukewarm feeling ratio in the JPC Survey data tends to increase during recession. Although this trend appears to be contrary to simple common sense, it is an established fact that can also be explained by the effective temperature hypothesis. Takahashi (2013) states that, since the body temperature is quite stable with a certain degree of constancy, the way the effective temperature changes (how the effective temperature makes us feel hot or lukewarm) is very similar to the way the system temperature changes. Takahashi (2013) explains this phenomenon is “much like the phenomenon experienced when driving a car: when we step on the accelerator, our bodies feel as if they are being held back; when we step on the brake, our bodies feel as if they being pushed forward. Since the human body is trying to move in a linear motion at uniform velocity, the law of inertia pulls the body back or pushes it forward in the event of sudden acceleration or deceleration.”

If this explanation is correct, then the most important factor in determining the lukewarm feeling ratio is not business confidence in Japan as a whole, but acceleration and braking in individual

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3 This is not to deny the possibility that the lukewarm feeling in Japanese companies can be a leading indicator of the climate of the Japanese economy (Takahashi, 2013). In fact, Takahashi dared to go on record predicting the economy by means of the lukewarm feeling, and was proved
companies. In other words, the lukewarm feeling increases when individual companies step on the brakes and decreases when they step on the accelerator.

This is clearly shown in Figure 2 from the Survey X data. As previously mentioned, Company X called for voluntary retirements in August 2005 due to the major restructuring and consolidation which achieved a two-thirds reduction in the number of offices. The second survey, taken directly after this in September 2005, shows a sudden rise in lukewarm feeling from 57.4% in the first survey to 62.9% in the second. The third survey, taken in February 2007, around one year after the new system was launched in April 2006, shows a sudden decrease to 53.4%. The effective temperature showed similar movements during this time. In the third survey, we see rapid improvement in the indicators, with the lukewarm feeling ratio and effective temperature working together.

correct (Takahashi, 2000).
4. Conclusion

The data from Survey X validate the effective temperature hypothesis. Takahashi (2013) indicates, on the basis of the data from 11 years of JPC Survey, that nurumayu [lukewarm] feeling ratio and effective temperature are linked to the business cycle. On the other hand, this article shows a link between lukewarm feeling ratio/effective temperature and organizational reform. In other words organizational reform as well as a business cycle also affects effective temperature, resulting in changes of lukewarm feeling.

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