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The Degree of Self-Determination and Job Satisfaction of White-Collar Workers in Japanese Firms

Nobuo TAKAHASHI

Graduate School of Economics, University of Tokyo

[E-mail: nobuta@e.u-tokyo.ac.jp](mailto:nobuta@e.u-tokyo.ac.jp)

Abstract: In most Japanese major companies, white-collar workers are engaged in lifetime employment system and seniority-based pay system. Since noncontingent money payments do not decrease intrinsic motivation, those companies provide a favorable and unique opportunity to observe and test intrinsic motivation. The present study tests a version of E. L. Deci's (1975) hypothesis that, if a person's feeling of self-determination is enhanced, his or her job satisfaction will increase. With a measure of self-determination which was first developed, the hypothesis was supported by data from 10,916 white-collar workers in 385 organizational units of 46 Japanese major companies: There is a strong linear relationship between the job satisfaction and the degree of self-determination.

Keywords: self-determination, job satisfaction, white-collar workers

The fundamental proposition of Deci's cognitive evaluation theory stated that if a person's feeling of competent and self-determination were enhanced, his or her intrinsic motivation would increase, and vice-versa (Deci, 1975, Proposition II). De Charms (1968) stated that a person's primary motivational propensity is to be effective in producing changes in his or her environment.

Similarly, Deci (1975) asserted that people engaged in many behaviors in order to feel competent and self-determining; the concept of competence referred to one's ability or capability to deal effectively with his or her surroundings (White, 1959). Thus competence has a same meaning as self-determination if it is traced back to its origin, and then Deci's above proposition is restated as

follows.

Hypothesis. If a person's feeling of self-determination is enhanced, his or her job satisfaction will increase, and vice-versa.

The idea that self-determination enhances job satisfaction has a long history in psychology under various names, for example, autonomy, job enrichment, participation, and so forth. It was certainly not discovered by Deci but goes back at least to Argyris (1957) and Herzberg et al. (1959). Many studies, including those based on Hackman and Oldham (1980), have confirmed that job satisfaction is related to autonomy.

It is nice to have a cross-cultural replication, though this may have been done by others also. Moreover, Japanese major companies can provide a favorable opportunity to observe intrinsic motivation. It is difficult to test Deci's hypothesis in a company without expectation of permanent employment because an employee might come to feel that the only significant reward is salary and positions. Deci (1971, 1972) hypothesized that rewards contingent on a high level of task performance should have a negative effect on intrinsic motivation. Most Japanese major companies have pinned their success on so-called three "sacred treasures": the lifetime employment system, the seniority-based pay system, and company unionism. There is still a tendency to follow the seniority tradition that the white-collar worker's salary increases as the number of years of

service increases in the lifetime employment system. Deci's (1975) finding stated that noncontingent money payments did not decrease intrinsic motivation. Therefore Japanese major companies can provide a favorable and unique opportunity to observe and test intrinsic motivation. Takahashi (1993, 2001) developed a measure of "propensity to change" in order to explain the lukewarm feeling in Japanese firms, and found that the propensity to change and intrinsic motivation were significant for organizational activation in Japanese firms (Takahashi, 1992).

To test our hypothesis, we conducted 11 surveys of white-collar workers in Japanese firms all of which have never modified the lifetime employment system even in the present economic difficulties in Japan. The first survey in 1990 was made to develop a measure of degree of self-determination (DSD), and then we made the follow-up surveys in 1991 to 2000 by using the same measures of self-determination and job satisfaction as the first survey. Through these 11 surveys, we obtained 10,916 white-collar workers' data from 385 organizational units of 46 Japanese major companies.

Developing a Measure of Self-Determination

In 1990, before the first survey, we made a preliminary survey of head offices at two Japanese manufacturing companies in order to select questions from among our preceding surveys' 100

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yes-no questions. 564 white-collar workers completed questionnaires (response rate was 84.1%). We selected 35 questions from among those 100 questions by multivariate analysis and theoretical examination.

Using these 35 questions, we made the first survey in 1990. First we selected nine Japanese companies who were members of Japan Productivity Center (JPC) in the following industries: motor vehicles and equipment (3), telecommunication (1), railways (2), petroleum products (1), banking (2). The member companies of Japan Productivity Center are the biggest largest and representative firms of Japan. Most of them are listed on the First Section of Tokyo Stock Exchange and satisfy the high-level initial listing requirement.

Then we selected from each company one or more organizational units. We investigated all the white-collar workers in 39 organizational units. The research was carried out from September 5 to 10, 1990 through the delivery-collection and self-recording method. The questionnaires were completed by 853 white-collar workers (response rate was 88.9%). 80.8% were men, 44.3% were managers, average age was 34.9 years, and most had college degrees.

To measure the degree of self-determination by multivariate analysis, five questions were selected from among 35 yes-no questions as follows:

Q1. "As you work on your job, do you continually keep in mind the policies of top management?"
1=yes, 0=no.

Q2. "Has authority been delegated to you by your superior?" 1=yes, 0=no.

Q3. "Do you believe your opinions are given due consideration?" 1=yes, 0=no.

Q4. "Are you able to see the desirable shape which your company will take in the 21st century?"
1=yes, 0=no.

Q5. "When you are thoroughly convinced that you have made a good decision, are you confident that the others will be as equally so?" 1=yes, 0=no.

The questionnaire was written in Japanese. These questions are intended not to have direct relationship with job satisfaction, that is, they are related only to the feelings of self-determination. For these questions, "yes" means a high degree of self-determination, and "no" means a low degree of self-determination. The yes-no answer to the question Q_i can be quantified and represented by a dummy variable D_i , $i=1, \dots, 5$. The dummy variable takes only two values, zero and one, which signify that the observation belongs to one of two possible categories. A dummy variable D_i is coded as 1 for "yes" and 0 for "no." The means of D_1 to D_5 were 0.508, 0.531, 0.633, 0.458, 0.588, and the standard deviations of D_1 to D_5 were almost equal: 0.500, 0.499, 0.482, 0.498, 0.492.

By principal component analysis on standardized variables, we obtained eigenvalues 2.258, 0.919, 0.682, 0.644, 0.498 for D_1 to D_5 . Only the first eigenvalue exceeded unity and the rest fell short of it. The corresponding vector of the

first principal component was (0.464, 0.479, 0.476, 0.379, 0.430). Although the weight of D_4 was slightly small, we could conclude that the degree of self-determination was calculated as the equally weighted sum of D_1 to D_5 .

Therefore the *degree of self-determination (DSD)* is defined and calculated as the sum of the “yes” replies to all five questions:

$$DSD = D_1 + D_2 + D_3 + D_4 + D_5.$$

DSD of a person is an integer from 0 to 5.

Follow-Up Surveys

By using the same questions Q1 to Q5, we made 11 follow-up surveys in 1991 to 2000. In total of 1990 to 2000, we selected 385 organizational units of 46 Japanese major companies who were JPC's members from the following industries: construction (4), petroleum products (2), chemical products (1), pharmacy (2), textile mill products (1), computer (3), machinery (4), heavy industries (1), motor vehicles and equipment (3), cement (1), tobacco (1), electric service (1), telecommunication (1), railways and road passenger transportation (4), banking (8), life insurance (1), retail trade (1), hotels (1), consultant (1), real estate development (2), security (1), service (2). 14 companies were investigated twice or more but their organizational units were different in each survey.

When perceptions are measured on the same questionnaire using basically the same item format, the correlation between variables obtained is potentially inflated because of a large number of

potential third variables that may influence the relationship. In order to avoid this response-response problem, in each survey, we used the questionnaire having 60 or more questions, and most of them except for Q1 to Q5 and Q6, which will be stated later, were replaced by new questions every year.

The research was carried out from August to September of every year. We obtained 10,916 respondents' data from the questionnaires (total response rate was 89.3%). 78.4% were men, 20.2% were managers, average age was 36.4 years, and most had college degrees.

Results

In the 11 surveys, job satisfaction was measured by means of the following question on job attitude:

Q6. “Are you satisfied with your job?”

1=yes, 0=no.

48.5% of the total respondents answered “yes,” and 51.5% answered “no.” The ratio of “yes” to total respondents of question Q6 is called the *job satisfaction ratio*.

We calculate the degree of self-determination and job satisfaction ratio, and then obtain Table 1. As been stated, in Japanese firms, there is the lifetime employment system and the seniority-based pay system where wages are not tied to behavior. From the standpoint of intrinsic motivation, we are afraid that in this situation self-determination would be very high and held relatively constant at a high

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Table 1. Pooled Results of 11 Surveys in 1990 to 2000

Q6. "Are you satisfied with your job?"	Degree of self-determination (DSD)						Total
	0	1	2	3	4	5	
Yes (A)	165	407	686	1114	1311	1474	5157
No	635	1004	1251	1151	874	565	5480
Total (B)	800	1411	1937	2265	2185	2039	10637
Job satisfaction ratio (A/B)	20.6%	28.8%	35.4%	49.2%	60.0%	72.3%	48.5%

level. However, Table 1 shows that self-determination is almost normally distributed. The mean of the degree of self-determination (DSD) is 2.91 and the variance is 2.36.

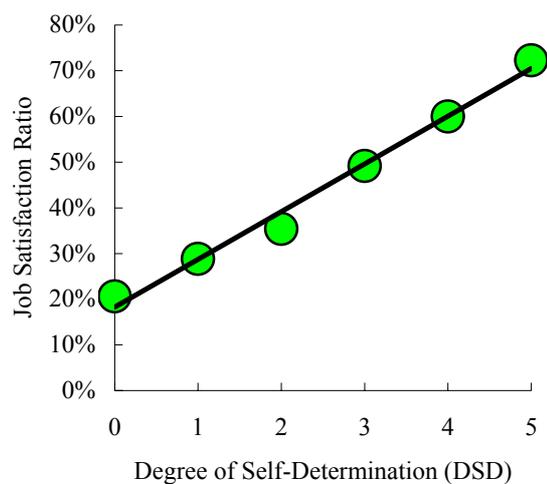
The graph of the job satisfaction ratio versus DSD in Figure 1 supports our hypothesis and suggests a straight line relationship. A linear model is fitted to the data and we regress job satisfaction ratio on DSD. The estimated coefficient of DSD is 10.44 ($t = 18.23$) and significant at $p < 0.0001$. The estimated constant is 18.28 ($t = 10.54$) and significant at $p = 0.0005$. In other words, for each degree increase in DSD, the job satisfaction ratio is expected to increase by 10%, thus the job satisfaction ratio is almost 50% at 3 degrees.

The high value 0.9881 of R^2 (adjusted R^2 is 0.9851) indicates a strong linear relationship between the job satisfaction ratio and DSD at significant level $p < 0.0001$ ($F = 332.30$). Therefore DSD can be used to forecast the job satisfaction ratio.

The scale used seems a very strange one. Q1 and Q4 seem focused on the issue of vision, Q2 on

delegation, Q3 on participation, and Q5 on group cohesion. They are clearly not homogeneous. But these five items can be loaded on one factor, that is, self-determination because Figure 1 shows a strong linear relationship.

Figure 1. Graph of the Job Satisfaction Ratio Versus the Degree of Self-Determination



Discussion

To prevent overgeneralization, it is important to stress that our hypothesis was supported when the white-collar workers of Japanese firms were tested. In our 11 surveys, we have investigated only full-time workers, that is, regular workers. Even in Japanese companies, part-time workers are excluded from the lifetime employment system and the seniority-based pay system.

In 1992, through JPC's consultation activity, we obtained data from all of the employees at a Japanese industry machinery company, Company A, including regular workers (white-collar and blue-collar workers) and part-time workers. 1,914 regular workers and 213 part-time workers completed questionnaires, and response rate was 97.4%. Unfortunately, JPC's version of questions Q1 to Q5 and DSD formula were used: Hence, we cannot exactly compare the degrees of self-determination of this case with those of the present study. Nonetheless, in Company A, we found that part-time workers had very low mean of degrees of self-determination which was 31% less than that of regular workers. On the other hand, the job satisfaction ratio of part-time workers was average 47.3% although that of regular workers was lower at 39.0%. The part-time workers might derive job satisfaction not from feelings of self-determination but from extrinsic rewards.

Kruglanski, Friedman, and Zeevi (1971) and Lepper, Greene, and Nisbett (1973) showed that a necessary condition to decrease intrinsic motivation

was rewards contingent not only on the high performance of task but also the completion of an activity. A salient reward is thus a necessary condition under which an extrinsic reward may decrease intrinsic motivation (Ross, 1975). The results of Calder and Staw's (1975) experiment showed that the introduction of money decreased satisfaction when the task was initially interesting and that the introduction of money increased satisfaction when the task was initially neutral.

Since part-time workers received salient rewards and their tasks were considered as initially more neutral than regular workers', it was expected that simultaneous with a reduction of the feelings of self-determination came a recovery of job satisfaction. Thus even in Japan, the existence of workers such as part-time workers would prevent the researchers from determining the relevance of our hypothesis. In fact, by dropping part-time workers from the data of Company A, there exists a linear relationship between the job satisfaction ratio and the degree of self-determination, which is similar to Figure 1, that is, the part-time workers can be regarded as outliers.

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