A cognitive model for life and work-related satisfaction: Evidence from confirmatory latent structure analysis

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Satisfaction with life, job, firm and income can be considered as indicators of the latent cognition about one's quality of life. In the present analysis, we postulated that, for most of the Japanese males, a) the two principal dimensions of the cognitive subspace related to covert evaluation of the attained intrinsic and extrinsic rewards of work, b) latent states in these dimensions were to be manifested as job and income satisfaction, respectively, c) job and firm satisfaction were indicators of the same cognition, and d) life satisfaction was the overall evaluation derived from cognition in these dimensions. The postulates were then translated into a latent class model and applied to the data of a large national sample. Although the model in the original form did not meet our acceptance criteria, the reasonable fit was obtained when it was modified to let job satisfaction partially reflect cognition in the other dimension as well. It was also found that there were two classes of people whose cognitive subspace comprised additional dimension(s). However, the classes were small in size. The results of our analysis provide evidence that both spillover and compensatory effects exist in a large population.

Key words: satisfaction, cognitive space, latent cognition, latent class, latent structure analysis.

Subjective evaluation of quality of life seems to involve two different kinds of cognitive space—social and personal: The former is used for evaluating one's relative social standing, while the latter is reserved for the evaluation of fulfilment concerning personal life goals. Careful analysis of them will reveal interesting properties of the human cognition. A researcher in this field, however, can only make indirect inferences about them, since covert evaluation in each space is not directly observable. The task becomes more difficult when one realizes that manifest indicators are usually imperfect reflections of the underlying states. In addition to it, there are possibilities that some indicators reflect more than one latent states as long as a given space is multidimensional rather than unidimensional. These points were substantiated for the "social" cognitive space by Matsuda (1982a) who applied Goodman's (1974a, 1974b, 1975) latent structure analysis (see also Haberman, 1975, 1977).

Life being a multifacet entity, it ap-

pears natural to assume multiple dimensions in the "personal" cognitive space, too. Overt expression of cognition in this space usually takes the form of satisfaction. The purpose of the present study is to identify basic dimensions of the space among Japanese men from their responses to the following satisfaction items essential to quality of life: satisfaction with job, firm, income and life as a whole. The first two items bear on intrinsic values of work, whereas the third item relates to extrinsic rewards (e.g., Kallerberg, 1977).

Few will disagree to the general belief that intrinsic values of work are not clearly differentiated in the minds of most Japanese men on account of their highly integrated conception of jobs and firms (e.g., N.H.K., 1979; Vogel, 1979). On the other hand, by the cultural norms, men's evaluation criteria for intrinsic and extrinsic, particularly monetary, rewards differ widely. As to life satisfaction, we concur with Rice, Near, and Hunt (1979) in viewing it as an overall evaluation in which satisfaction with respect to the other

three items are subsumed. In sum, two of the basic dimensions in the personal cognitive space pertain to the evaluation of attained intrinsic and extrinsic rewards of work, respectively, in comparison to one's expectations. And, manifest life satisfaction is a compound indicator of the underlying cognition in the two dimensions.

The propositions presented above are expected to provide alternative interpretations of the relationships between life and work-related satisfaction. It was the spillover and compensatory hypotheses suggested by Wilensky (1960) that stimulated researchers to empirically determine the causal linkages between satisfaction with work and nonwork activities. According to the former hypothesis, work satisfaction is positively related to nonwork or general satisfaction, while the latter asserts that people compensate dissatisfaction with work by nonwork activities. The past research provides mixture of evidence supporting either spillover hypothesis (Iris & Barrett, 1972; Orpen, 1978; Rousseau, 1978) or compensatory hypothesis (London, Crandall, & Seals, 1977; Tunstall, 1962). Comparing the analyzed samples, Rousseau (1978) noted that the difference in the evidence was attributable to the occupational settings used in the studies. Then, it seems more plausible to consider that both hypotheses hold in a large working-age population rather than to attempt total rejection of either one in favor of the other. In other words, we believe that life satisfaction is derived from the evaluation of rewards accruing from work as well as from nonwork activities, but different weights are assigned to the two sets of cognition in a large population.

Before closing this section, we should refer to Keon and McDonald's (1982) work in which they radically opposed the popular conceptualization of job satisfaction as a subcomponent of life satisfaction. They maintained that the two were mutu-

ally affected. Nonetheless their arguments are questionable in the following points (Matsuda, 1982b): The asserted mutual causality poses difficulty in drawing substantive interpretations as compared with our model; they failed to take into account the measurement and response errors likely to occur in eliciting cognition by questionnaire items (see Anderson, 1973; Clogg, 1979); and, their intension of statistical improvement should have been sought in the techniques appropriate for nonmetric variables instead of adhering to the regression models, since the measurement of satisfaction on a Likert scale is ordinal (Clogg, 1979). Upon consideration of the foregoing issues, we decided to apply latent structure analysis to our models.

Modeling. For expediency, we let A , B , C and D denote satisfaction with job, firm, income and life in general, respectively.

A schematic diagram of our preliminary model is shown in Fig. 1 in which Y and Z pertain to covert evaluation of the attained intrinsic and extrinsic rewards of work, respectively. A and B are the overt expressions of Y only, while C is the manifestation of Z alone. In contrast, D is a compound indicator, reflecting both Y and Z . If the model does not fit the data well, modifications are to be made in the following manner. We will put C under the influence of Y at a certain level of Z . Alternatively, we may allow A and/or B dependent on Z at a certain level of Y . Modifications will be realized by imposing different sets of restrictions on the parameters as explained in the next section. Our approach is, thus, confirmatory rather than exploratory.

Method

Data. The survey data for the present study were collected by the SSM (Social Stratification and Mobility) Committee in 1975. The population for the survey covered all Japanese civilian males aged

Table 1
Cross-classification of satisfaction with Job (A), Firm (B), Income (C)
and Life in general (D) among Japanese men ($N=2\,475$)

Satisfaction D	Satisfaction B	Satisfaction C								
		Low Satisfaction A			Medium Satisfaction A			High Satisfaction A		
		L	M	H	L	M	H	L	M	H
Low	Low	68	10	22	4	1	1	8	3	2
	Medium	6	48	20	1	9	5	3	4	4
	High	16	10	78	2	3	20	4	5	25
Medium	Low	42	16	17	8	2	1	2	1	5
	Medium	20	62	19	7	49	14	1	8	10
	High	12	28	93	4	16	101	1	9	89
High	Low	35	13	33	8	7	11	11	6	11
	Medium	10	22	25	2	26	19	4	19	39
	High	19	21	184	7	17	205	24	24	654

20 to 69 from which a random sample was drawn by stratified two-stage, systematic sampling design. The total sample was divided into Subsamples A and B (see Ando, 1978). The items under study were contained only in the questionnaire for Subsample A which retained 2 724 respondents.

Recoding and case selection. Respondents in Subsample A were asked to express their levels of satisfaction with job, firm (or activities in the case of the self-employed) and life in general. The items will be denoted in the text either a) as JOB, FIRM, INCOME and LIFE or b) as A, B, C and D, respectively. Responses were originally measured on a five point scale but recoded as follows:

- (1) low—rather dissatisfied, dissatisfied,
- (2) medium—not satisfied nor dissatisfied, and
- (3) high—rather satisfied, satisfied.

This was necessary to insure asymptotic efficiency of the parameter estimation (Matsuda, 1982a, 1982b). Cases with missing values due to non-responses were eliminated listwise. Also deleted were students and the unemployed persons whose work-related satisfaction requires separate treatment. As a result, 2 475 cases

remained for the present analysis.

Latent class models. For the sake of simplicity, we will first explain a basic model with a single latent variable X . The satisfaction items will be called variables in the explanations to maintain consistency in terminology. Shown in Table 1 is the four-way cross-classification of 2 475 cases with respect to the manifest variables A, B, C and D. Let π_{ijkl}^{ABCD} denote the probability that a randomly selected individual is at level (i, j, k, l) with respect to the joint variable (A, B, C, D), where $1 \leq i, j, k, l \leq 3$. Had we been able to observe the variable X , we would have a five-way table comprised of (A, B, C, D, X). Let π_{ijkl}^{ABCDX} (for $1 \leq t \leq T$) denote the similar probability applicable to this hypothetical table. Equation (1) holds true due to the assumption of local independence (Lazarsfeld & Henry, 1968), given class t of the variable X .

$$\pi_{ijkl}^{ABCDX} = \pi_i^X \pi_{it}^{AX} \pi_{jt}^{BX} \pi_{kt}^{CX} \pi_{lt}^{DX} \quad (1)$$

where π_i^X denotes the probability that an individual is in class t with respect to the variable X , and π_{it}^{AX} denotes the conditional probability that an individual is at the i th level on the variable A, given class t . π_{jt}^{BX} , π_{kt}^{CX} and π_{lt}^{DX} can be similarly

defined for the variables B , C and D . The interpretation of equation (1) is straightforward: The manifest variables A , B , C and D are independent of each other within each class of X .

Summing cells in the hypothetical five-way table across T classes of X , we would obtain Table 1. Thus, we have

$$\pi_{ijkl}^{ABCD} = \sum_{t=1}^T \pi_{ijklt}^{ABCDX}. \quad (2)$$

Substituting equation (1) into equation (2), we can rewrite equation (2) as

$$\pi_{ijkl}^{ABCD} = \sum_{t=1}^T \pi_t^X \pi_{it}^{\bar{A}X} \pi_{jt}^{\bar{B}X} \pi_{kt}^{\bar{C}X} \pi_{lt}^{\bar{D}X}. \quad (3)$$

The iterative procedure provided by Goodman (1974a, 1974b) yields the estimates for the basic set of parameters (π^X , $\pi^{\bar{A}X}$, $\pi^{\bar{B}X}$, $\pi^{\bar{C}X}$, $\pi^{\bar{D}X}$) that are the maximum likelihood estimates, terminal maxima (0 or 1) or some other solutions. Let n_{ijkl} and $\hat{m}_{ijkl}$ denote the observed and estimated expected frequencies, respectively. Then, the likelihood ratio chi-square statistic defined by

$$LR^2 = 2 \sum \sum \sum \sum n_{ijkl} \log(n_{ijkl}/\hat{m}_{ijkl})$$

is known to be minimized by the maximum likelihood estimates for the basic set of parameters. (See Matsuda, 1982a, as to the decision rule for selecting the estimates.) The fit of an unrestricted latent class model applied to the four-way table can be tested, when the parameters are locally identifiable (Goodman, 1974a), with degrees of freedom

$$df = \prod_{u=1}^4 h_u - 1 - [T \{ \sum_{u=1}^4 (h_u - 1) + 1 \} - 1], \quad (4)$$

where h_u is the number of the categories of the manifest variable u : $h_u = (3, 3, 3, 3)$ in Table 1.

Restrictions. The two latent variables Y and Z form a 3×3 table (see Table 2) in which cell (r, s) can be treated as the t th level of a joint latent variable X . Thus, we have indeed 9 classes in our first, unrestricted, model. The assumption of

Table 2
Latent variable X arising from the joint latent variable (Y, Z)

		Variable Y			
		$r=1$	2	3	
Variable Z	$s=1$	π_1^X	π_2^X	π_3^X	π_1^Z
	2	π_4^X	π_5^X	π_6^X	π_2^Z
	3	π_7^X	π_8^X	π_9^X	π_3^Z
		π_1^Y	π_2^Y	π_3^Y	

local independence applies to the joint occurrence of Y and Z , or alternatively stated, to X . Category orders of the variables Y and Z were assumed to correspond to those of the manifest variables described earlier in this section, i.e., low, medium and high for $r, s=1, 2, 3$. As a matter of fact, the exact wording or the form, (verbal or nonverbal), of cognition is not crucial in our approach (Matsuda, 1982a). Only the order is important.

From (4) it is clear that the first model of 9 latent classes is not locally identifiable. Therefore, a new model, $M9$, was constructed by imposing restrictions on the parameters in the basic set in accordance with our propositions which were translated into the following constraints

$$\pi_{it}^{\bar{A}X} = \pi_{it+3}^{\bar{A}X} = \pi_{it+6}^{\bar{A}X} \quad \text{for } t = 1, 2, 3; \quad (5)$$

$$\pi_{jt}^{\bar{B}X} = \pi_{jt+3}^{\bar{B}X} = \pi_{jt+6}^{\bar{B}X} \quad \text{for } t = 1, 2, 3; \text{ and,} \quad (6)$$

$$\pi_{kt}^{\bar{C}X} = \pi_{kt+3}^{\bar{C}X} = \pi_{kt+2}^{\bar{C}X} \quad \text{for } t = 1, 4, 7. \quad (7)$$

No restriction was necessary for D , because it was held to reflect both Y and Z . To test the fit of a restricted model, the degrees of freedom derived from (4) was adjusted for the number of non-redundant restrictions. Further adjustment was made for models with extreme estimates, i.e., 0 or 1, after Goodman (1974b).

Modified restricted models were constructed lest $M9$ should fail to fit the data

well. First, we let the variables A and B also reflect Z_2 in model $M9-10$. In addition, the variable C was put under the influence of Y if cognition Z was moderate, i.e., Z_2 . The underlying premise was that moderate covert evaluation about the extrinsic rewards, Z_2 , would permeate manifest satisfaction with job and firm, and that Z_2 would help covert evaluation of intrinsic rewards, Y , confound income satisfaction. In other words, we added to $M9$ all the dotted paths in Fig. 1 for Z_2 . In terms of model specifications, we withdrew restrictions (5), (6) and (7) for the latent classes 4, 5 and 6. Second, the variable C was similarly treated in $M9-20$ as a partial compound indicator of Y_2 in addition to Z_1 , Z_2 and Z_3 . At the same time, the variables A and B were subjected to the influence of cognition Z , when cognition Y was moderate, i.e., Y_2 . That is, the latent classes 2, 5 and 8 were exempted from the above restrictions. As the third modified model, $M9-30$, all the constraints were relaxed for the latent class 5 where both cognition with respect to Y and Z were moderate, i.e., Y_2 and Z_2 . Finally, we constructed $M9-40$, retaining the restrictions except for the latent classes 2, 4, 5, 6 and 8 comprised of Y_2 or Z_2 .

When further modifications were necessary due to local unidentifiability, unsatisfactory fit or uninterpretability of the estimated parameters, we confined our-

Fig. 1. A cognitive model for life and work-related satisfaction.

Note. The dotted paths are added in the modified models.

Table 3
Paths added to $M9$ in the modified models— $M9-1$'s, $M9-2$'s, $M9-3$'s and $M9-4$'s

Model	Added paths	
$M9-10, 20, 30, 40$	$Z \rightarrow$ JOB, FIRM	$Y \rightarrow$ INC
$M9-11, 21, 31, 41$	$Z \rightarrow$ JOB, FIRM	
$M9-12, 22, 32, 42$		$Y \rightarrow$ INC
$M9-13, 23, 33, 43$	$Z \rightarrow$ JOB	
$M9-14, 24, 34, 44$	$Z \rightarrow$ FIRM	
$M9-15, 25, 35, 45$	$Z \rightarrow$ JOB	$Y \rightarrow$ INC
$M9-16, 26, 36, 46$	$Z \rightarrow$ FIRM	$Y \rightarrow$ INC

Note. These paths are expressed by the dotted lines in Fig. 1.

selves to the alternative models lying between $M9$ and the above four models in complexity. Variations of $M9-10, -20, -30$ and -40 were generated by adding one or two of the dotted paths in Fig. 1 to the extremely restricted model, $M9$, as shown in Table 3.

Model selection criteria. Multiple criteria were employed to guard against under- and overfitting, on the one hand, and to choose a useful final model in future substantive applications, on the other. First, unidentifiable models should be eliminated from the consideration. Among identifiable models, then, those which yielded large chi-square values (LR^2) in light of the degrees of freedom (df) were also to be discarded on the basis of the ratio of LR^2 to df and the ordinary significance level, p . From our earlier experiences, we set the following bounds:

$$.80 < LR^2 / df < 1.20 \text{ and } .100 < p < .600.$$

Finally, in case more than one model should satisfy the above criteria, they would be compared with each other in the error rate in assigning respondents to the modal latent classes. The best model

Table 4
Fit information of the identifiable
restricted models, $T=9$

Model	LR^2	df^*	LR^2/df	p	Error rate
<i>M9-10</i>	28.35	29	.98	.499	23.8
-13	40.72	36	1.13	.270	17.6
-14	49.72	40	1.24	.140	13.7
-15	32.07	32	1.00	.463	24.9
-16	49.96	39	1.28	.113	12.3
<i>M9-21</i>	45.15	37	1.22	.168	19.6
-24	51.22	37	1.38	.060	16.6
<i>M9-31</i>	52.66	38	1.39	.057	15.0
-33	56.95	39	1.46	.031	15.7
-34	56.32	41	1.37	.056	19.9
<i>M9-41</i>	33.76	34	.99	.480	16.4
-43	39.89	36	1.11	.301	17.9
-44	45.08	38	1.19	.200	17.8

should have the minimal error rate (see Clogg, 1979) defined as

$$E = \sum \sum \sum \sum \hat{\pi}_{ijkl}^{ABCD} (1 - \hat{\pi}_{*}^{ABCD\bar{X}})$$

where $\hat{\pi}_{*}^{ABCD\bar{X}}$ is the maximum conditional probability given a joint response (A, B, C, D).

Results

The first model, *M9*, does not satisfy the criterion of parameter identifiability. Hence, it is necessary to fit the modified models of which only 13 are identifiable as shown in Table 4. Among them, the reasonable fit is found under *M9-10*, -13, -15, -41, -43 and -44 in light of the second criterion. However, *M9-10* and *M9-15* should be eliminated due to their relatively large error rates (.238 and .249) as compared with those of the other four models (<.180). The differences among the remaining models are so small in terms of both error rates and patterns of the estimated parameters in the basic set ($\hat{\pi}_i^X, \hat{\pi}_{it}^{\bar{A}X}, \hat{\pi}_{jt}^{\bar{B}X}, \hat{\pi}_{kt}^{\bar{C}X}, \hat{\pi}_{lt}^{\bar{D}X}$) that acceptance of any one of them as the final model should not cause serious problems. After careful examination of the estimates, we decided to accept *M9-13* for the sake of interpretability of the estimated parameters. (See Matsuda, 1982b, for the points where the model differed from *M9-41*, -43 and -44.)

The estimated parameters in the basic

Table 5
Estimates for the parameters in the basic set under model *M9-13*

Parameters		Latent class								
		$t=1$ (r, s)=(1, 1)	2 (2, 1)	3 (3, 1)	4 (1, 2)	5 (2, 2)	6 (3, 2)	7 (1, 3)	8 (2, 3)	9 (3, 3)
$\hat{\pi}_i^{\mathbf{x}}$		.142	.025	.098	.023	.100	.158	.022	.011	.420
$\hat{\pi}_{it}^{\mathbf{Ax}}$	$i=1$	.631	.000	.029	.087	.104	.014	.631	.000	.029
	2	.143	.773	.034	.276	.737	.178	.143	.773	.034
	3	.226	.227	.938	.637	.159	.809	.226	.227	.938
$\hat{\pi}_{jt}^{\mathbf{Bx}}$	$j=1$	.703	.025	.008	.703	.025	.008	.703	.025	.008
	2	.111	.924	.056	.111	.924	.056	.111	.924	.056
	3	.186	.050	.937	.186	.050	.937	.186	.050	.937
$\hat{\pi}_{kt}^{\mathbf{Cx}}$	$k=1$	.906	.906	.906	.509	.509	.509	.001	.001	.001
	2	.067	.067	.067	.411	.411	.411	.195	.195	.195
	3	.028	.028	.028	.080	.080	.080	.804	.804	.804
$\hat{\pi}_{lt}^{\mathbf{Dx}}$	$l=1$	.406	.996	.304	.000	.067	.084	.359	.149	.302
	2	.329	.005	.000	.000	.677	.607	.104	.000	.106
	3	.265	.000	.696	1.000	.256	.309	.537	.851	.864

set under the final model *M9-13* are presented in Table 5. They represent the degree to which each manifest variable accurately reflects the underlying cognition. Therefore, those of the substantial size, e.g., $>.600$, are of primary interest here. First, the conditional probabilities pertaining to FIRM, $\hat{\pi}^{\bar{B}X}$, show a pattern consistent with our hypothesis. Due to the equality constraints (6), it suffices here to examine the parameters for classes 1, 2 and 3. The lowest level of FIRM (B_1) reflects Y_1 with 70.3 percent accuracy. Accuracy as an indicator of latent cognition Y increases at the higher levels of the variable—92.4 and 93.7 percent for B_2 and B_3 , respectively. Contrary to the expectation concerning undifferentiation of JOB and FIRM, cognition of class 4 (Y_1, Z_2) is likely to take contrasting manifest expressions in these variables: While it is the highest level of JOB (A_3) that most accurately reflects the cognition (63.7 percent), dissatisfaction with firm (B_1) arises from the same cognitive state as explained above. Except for this anomaly, the patterns among the remaining parameters, $\hat{\pi}^{\bar{A}X}$ and $\hat{\pi}^{\bar{B}X}$, are congruent with our hypothesis despite the partial removal of constraints (5). The accuracy rate of JOB for classes 1, 2 and 3 (as well as 7, 8 and 9) increases as a monotone function of cognition Y —63.1, 77.3 and 93.8 percent for Y_1, Y_2 and Y_3 , respectively. Interaction of Z_2 in classes 5 and 6 appear to be small: The conditional probabilities of the modal levels of JOB, A_2 and A_3 , increase as a monotone function of cognition Y . The values, .737 and .809, are close to those of classes 2 and 3 (as well as 8 and 9).

Second, INCOME appears to be a good indicator at the extreme levels, C_1 and C_3 , in reflecting Z_1 and Z_3 , respectively, with 90.6 and 80.4 percent accuracy. By contrast, Z_2 has no distinctive manifestation in terms of income satisfaction. It is likely to be expressed as either low or medium level on the variable with com-

parable probabilities. Given Z_2 , dissatisfaction with income, C_1 , has even higher probability (50.9 percent) than that of the hypothesized relevant level, C_2 (41.1 percent), though the difference is minor.

Third, inspection of the parameters pertaining to LIFE, $\hat{\pi}^{\bar{D}X}$, reveals spillover effects due to cognition Y in classes 3, 5 and 9 where the modal levels of JOB, FIRM and LIFE agree. Concerning classes 3 and 9, highly evaluated intrinsic rewards, Y_3 , is likely to induce satisfaction A_3, B_3 and D_3 , whether extrinsic rewards are evaluated poorly, Z_1 (class 3), or highly, Z_3 (class 9). The conditional probabilities $\hat{\pi}^{\bar{D}X}$ for these classes are .696 and .864, respectively. The effect can also be found at the intermediate levels of satisfaction, A_2, B_2 and D_2 , but is limited to class 5 of joint cognition (Y_2, Z_2): Moderate evaluation of intrinsic and extrinsic rewards manifest itself as moderate JOB, FIRM and LIFE with 73.7, 92.4 and 67.7 percent accuracy, respectively. Spillover effects due to cognition Z are present in classes 2 and 8, but in the opposite directions. Poorly evaluated extrinsic rewards, Z_1 , of the former class produces dissatisfaction with life, D_1 , discounting moderate cognition Y_2 ; and, Z_3 of the latter induces manifest satisfaction with life, D_3 , either additively to or independently of Y_2 . D_1 and D_3 of these classes are fairly distinctive with the respective accuracy rate of 99.6 and 85.1 percent. Satisfaction with life, D_3 , of class 9 is another evidence of the spillover effect due to Z_3 which acts here in concert with Y_3 . The observed spillover effects can be summarized in terms of the following response patterns;

(3313:31) and (2202:22) of classes 3 and 5 due to Y ;

(2211:21) and (2233:23) of classes 2 and 8 due to Z ; and

(3333:33) of class 9 due to Y and Z .

The numbers denote the modal levels of the variables A, B, C and D given (Y, Z),

respectively. Zero in the second set means the lack of primacy among $\hat{\pi}_{k5}^x$. The last pattern has the largest base in terms of the latent class size ($\hat{\pi}^x$)—42.0 percent—as compared to all other response patterns. The sizes of class 3 as well as 5 are approximately 10 percent, while classes 2 and 8 are smaller in size—2.5 and 1.1 percent, respectively.

Finally, response patterns of classes 1, 4 and 7 do not allow straightforward interpretations in favor of either compensatory or spillover hypothesis, since interpretations based on the agreement or disagreement of modal levels are no longer applicable a) in the absence of primacy of the conditional probabilities pertaining to LIFE in classes 1 and 7, and b) due to the anomaly of class 4 mentioned above. The lack of primacy of $\hat{\pi}^x$ in class 6 adds to the difficulty of interpreting the disagreement of the modal levels A_3 and B_3 , on the one hand, and D_2 on the other. Nonetheless, if LIFE is assumed to result also from some averaging operations on cognition Y and $\tilde{Z}$, the patterns of classes 6 and 7 can be considered as a different kind of spillover effects. The modal levels of LIFE in these classes are low in distinctiveness; $\hat{\pi}_{26}^x$ and $\hat{\pi}_{37}^x$ are .607 and .537. By contrast, the response pattern of class 1 is relatively more consistent with the compensatory hypothesis than the other, provided that the effect of cognition (Y_1 , $\tilde{Z}_1$) is attenuated by (covertly) perceived fulfilment in nonwork activities. Yet the compensation is not sufficient enough to give primacy to D_2 or D_3 . Another compensatory effect can be inferred, though indirectly, from the results of class 4 in which D_3 , satisfaction with life, is the unambiguous overall manifestation of the perceived quality of life. Given the size and the distribution of the conditional probabilities of the modal levels A_3 (.637), B_1 (.703) and C_1 (.509), it seems reasonable to consider that LIFE of this class is the product of compensation accruing from nonwork

activities. The proportions classes 1 and 4 are 14.2 and 2.3 percent, respectively.

Discussion

The dual goal of the present analysis was mostly met. First, it provided empirical evidence that satisfaction with job and firm (or activities in the case of the self-employed) were undifferentiated among Japanese men, because of the common cognitive base pertaining to intrinsic rewards of work. In the final model, however, it was necessary to allow the moderate covert evaluation of extrinsic rewards of work to permeate job satisfaction. Partly as a result of this change, a minor but interesting tendency was found in the contradictory levels of satisfaction with job and firm in class 4. In view of the unusually distinctive satisfaction with life among people in this class, dissatisfaction with firm appears to bear little importance to them or, more probably, to be compensated by nonwork activities. Further studies seem needed to shed light on their cognitive algebra.

According to the selected model, life satisfaction of approximately 65.4 percent of the population was determined chiefly by either (classes 2, 3, 5 and 8) or both (class 9) kinds of cognition concerning rewards of work. The proportion increases to approximately 83.5 percent given that our interpretations about the response patterns of classes 6 and 7 are correct. That is, they constitute the two principal dimensions in the cognitive subspace specialized for the evaluation of the personal aspects of life. Nevertheless, the obtained results indicate that to the remaining 16.5 percent of the population (classes 1 and 4) there exist other important dimensions in the space. Coexistence of different structures of the cognitive space in a large population has not been fully recognized in the previous studies which instead claimed to have verified a single-structure model generally known as the

spillover or compensatory hypothesis. Our second goal was to clarify this point by applying a more relevant statistical technique. Although there remains much to be improved, the final model comprised response patterns congruent with either hypothesis in support of our postulates.

While the difference may not be entirely attributable to the properties of the methodologies employed, latent structure analysis has the advantage over regression analysis to unveil complex response patterns such as those identified here (Matsuda, 1982b). This adds to the merit of the present approach besides conformity with the measurement level and incorporation of response errors in expressing latent cognition. Thus we believe that our model is more tenable than those of the earlier studies.

In sum, our cognitive model based on the premise of the centrality of work in life was consistent with the empirical observations. Yet, some refinements are felt necessary in future work, for instance, by including indicators appropriate for cognition pertaining to nonwork activities. Also needed is an adequate explanation as to why income satisfaction failed to be a distinctive indicator of cognition ζ in classes 4, 5 and 6. It will be of interest to find out if it is attributable to the nature of the cognition or to the lack of validity of the questionnaire item as an indicator.

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