Studies on Person Perception (2) : About the Fuzziness of Person Categories

STUDIES ON PERSON PERCEPTION (2): ABOUT THE FUZZINESS OF PERSON CATEGORIES

By

KAZUYA H O R I K E (堀毛一也)[1]

(*Iwate Prefectural Morioka Junior College*)

Three experiments were conducted for defining the fuzzy property of the person category. According to the method of McCloskey & Glucksberg (1978), subjects judged whether their colleagues could be attributed to some person categories or not. At the same time, they judged the membership of the unknowns and that of some natural objects in the same way. Two kinds of ratings, i.e. Yes-or-No rating and 10 points rating, were used for the judgments. As a result, two ratings correlated highly. One week later, the identical procedures were repeated. Inter-subjects congruency and intra-subject consistency correlated highly through all categories. Most of stimulus persons were judged somewhat incongruently, and at the same time, more or less, inconsistently. From the results, we concluded that person categories had a fuzzy property as well as object categories. Moreover person categories seemed to be more fuzzy than object categories. In addition, from the comparison of the judgement of the unknowns and those of the friends, it was possible to decide the degree of the ambiguity of each target person's total image as the functions of incongruence and inconsistency. And the same parameters might be applied to decide the discriminative function of a category in a particular social group.

INTRODUCTION

Categorization is one of the styles of information processing that we develop for coping complex environmental stimulus. By ordinary, it means the function of smpilifying various information selectively, and reducing their complexity, for efficient recognition. We have actually a lot of categories for various objects. Person categories are the most important ones among them, and we can make free use of them for differentiating other persons. For example, we have a sexual category (men-women), a racial category (Japanese-foreigner), some physical categories (blackeyes-blue eyes), and so on. Discrimination on these categories has an all-or-none character, and membership of an object which is attributed to these categories is defined; that is to say, two sets, men and women, make a complementary set. Accordingly there is a clear boundary between them. As to the discrimination of others, we also use dispositional categories as well as these appearance categories. They are very important categories, and the greater parts of person perceptual studies have been

---

1. Department of Psychology, Iwate Prefectural Morioka Junior College, Sumiyoshi-cho 1–48, Morioka, Iwate, 020 Japan.

rather concerned with the discrimination by them. Unlike the appearance category, however, we often lack in judgmental consistency in these categories. It is caused by the variety of human behaviour or the complexity of situational factor such as context. But on the other hand, the lack of consistency can be attributed to the ambiguity of categorical boundary. If the boundary is ambiguous, different attribution is done as to the same stimulus constellation. And we can regard it as the cause of inconsistency. Such ambiguity of the categorical boundary was named "fuzziness" by Zadeh (1965).

Some objects are attributed to a category at all times, and others are always not, But, taking the complexity of person stimulus into account, these objects are rarely the case, and many other objects can't be attributed definitely to the category. According to the Fuzzy Sets Theory advocated by Zadeh, a degree of membership is determined about each object, and a membership function is calculated from the distribution of it. Fig. 1 shows hypothetical functions about some categories. In such a category as sex (men-women); the functional value is only 0 or 1. On the other hand, another category as "serious" or "rational", the function seems to change as Fig. 1 hypothetically. These functions are different with each person or each social group in their patterns.
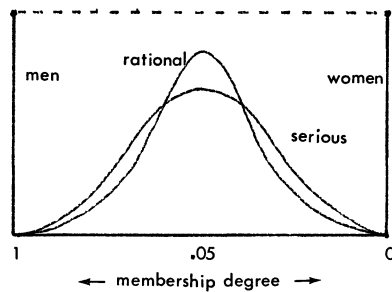

Fig. 1. Some hypothetical membership functions in person categories.

Recently, McCloskey & Glucksberg (1978) showed experimentally that most categories we were using everyday had the fuzzy property of this sort. Moreover, Canter & Mischel (1979) pointed out that the fuzzy property was also applied well in person categories. And they clarified the importance of categorical prototype in the study of person perception. In this paper the author reports an experimental study of the fuzzy property of person category. The method is partly in accordance with that of McCloskey et al. The purpose of this study is given as follows. 1) To designate the fuzziness of person category, considering the difference in that of natural category. 2) To examine whether categories show different fuzziness to each other, and to think out the reason, if they show a difference. 3) To inquire into the relation between the familiarity with the target person and the ambiguity of his image.

EXPERIMENT I

METHOD

Fifty-three female students of Morioka Junior College were instructed to evaluate impressions of each other, using three trait adjectives (lively, positive, ingenuous). One stimulus person was paired at random with one of three traits as "Miss A-lively", and 53 pairs in total were presented to subjects viva voce. Subjects answered to all pairs except one which included herself. Thirty-four of them judged the congruency of each pair with either Yes (congruent) or No (incongruent), and the rest of them 19 persons rated each pair on a 10 points scale which indicated the degree from highly typical (10) to extremely atypical (1). The former was called "congruency rating" while the latter was called "typicality rating". At the same time, sixty objects belonging to three categories (Animals, Fruits, Furniture), chosen from the experimental list of McCloskey et al., were rated in the same way as before.

RESULTS

For every pair of six categories, averages of each rating were computed between the subjects. The results are shown in Table 1 and Table 2. And the same results are illustrated with Fig. 2 and Fig. 3. On the horizontal line, 0 indicates the consensus of "No" between the subjects, conversely 1 indicates the consensus of "Yes". 0.5 shows

Table 1. Avarage Scores of the congrueucy rating and the typicality rating (object).

Animals				Fruits				Furniture			
Candidate Exemplar	Typi-cality	M* R	N** R	Candidate Exemplar	Typi-cality	M R	N R	Candidate Exemplar	Typi-cality	M R	N R
Dog	10.00	Y	.00	Banana	9.94	Y	.00	Table	10.00	Y	.00
Horse	10.00	Y	.00	Pineapple	9.88	Y	.03	Chair	8.82	Y	.15
Cow	9.35	Y	.06	Melon	9.29	Y	.06	Bed	8.58	Y	.15
Sparrow	8.47	Y	.23	Apple	9.18	Y	.00	Shelf	5.29	Y	.12
Snake	7.82	Y	.23	Papaya	8.82	Y	.09	Rug	5.23	N	.41
Lizard	7.59	Y	.29	Fig	8.17	Y	.26	Stove	4.94	N	.18
Tadpole	6.35	Y	.38	Watermelon	7.35	Y	.32	Lampshade	4.76	Y	.23
Lobster	6.35	—	.50	Pomegranate	6.76	Y	.26	Curtains	4.29	N	.41
Trout	5.88	Y	.35	Olive	5.35	N	.47	Candlestick	3.88	N	.41
Sea Anemone	5.52	Y	.44	Raisin	5.29	N	.41	Bookends	3.29	N	.41
Goldfish	5.47	Y	.47	Coconut	3.64	N	.24	Ironing Board	3.29	N	.24
Mosquito	5.18	Y	.38	Orange Juice	2.76	N	.06	Electric Fan	2.70	N	.24
Spider	5.00	Y	.44	Corn	2.29	N	.03	Telephone	2.58	N	.38
Amoeba	4.05	N	.38	Tomato	2.24	N	.12	Ventilation Fan	2.47	N	.38
Bacterium	3.88	N	.21	Acorn	2.00	N	.00	Potted Plant	2.12	N	.06
Cocoon	3.76	N	.35	Cucumber	1.94	N	.03	Door	2.05	N	.18
Euglena	3.00	N	.41	Pumpkin	1.58	N	.00	Ashtray	1.88	N	.21
Egg	1.88	N	.09	Eggplant	1.29	N	.00	Window	1.76	N	.09
Tree	1.00	N	.00	Peanut	1.18	N	.03	Pillow	1.58	N	.12
Tulip	1.00	N	.00	Chicken	1.00	N	.00	Fence	1.23	N	.00

* congruency (modal response)
** congruency (proportion of nonmodal responses)

Table 2.   Average Scores of the congruency rating and the
typicality rating (person).

| Lively				Positive				Ingenuous			
Target Person (Number)	Typi-cality	M R	N R	Target Person (Number)	Typi-cality	M R	N R	Target Person (Number)	Typi-cality	M R	N R
10	8.83	Y	.03	50	7.33	Y	.29	36	8.83	Y	.03
43	8.44	Y	.06	17	7.33	Y	.32	15	8.06	Y	.03
7	8.33	Y	.21	5	6.61	Y	.12	33	7.61	Y	.06
49	8.27	Y	.00	35	6.44	Y	.44	51	7.33	Y	.24
4	8.00	Y	.12	41	6.38	N	.35	48	7.00	Y	.09
1	7.77	Y	.03	23	6.22	N	.38	42	6.77	Y	.12
40	7.28	Y	.18	26	6.05	N	.47	3	6.55	Y	.03
52	7.11	Y	.24	32	5.83	Y	.35	45	6.44	Y	.21
37	7.05	Y	.24	8	5.77	N	.35	9	6.33	Y	.15
13	6.88	Y	.15	2	5.66	Y	.32	6	6.00	Y	.29
25	6.67	Y	.29	29	5.61	N	.47	39	5.88	Y	.47
28	6.27	Y	.35	38	5.61	N	.38	30	5.78	Y	.21
46	5.94	N	.35	53	5.55	N	.35	24	5.33	Y	.26
19	5.16	N	.41	11	5.00	N	.21	27	4.50	N	.21
22	5.00	N	.38	47	4.83	N	.26	18	4.16	N	.21
16	4.83	N	.29	44	4.77	N	.24	12	3.33	N	.21
34	4.11	N	.08	14	4.77	N	.15	21	2.94	N	.06
31	2.83	N	.00	20	4.39	N	.08	—	—	—	—
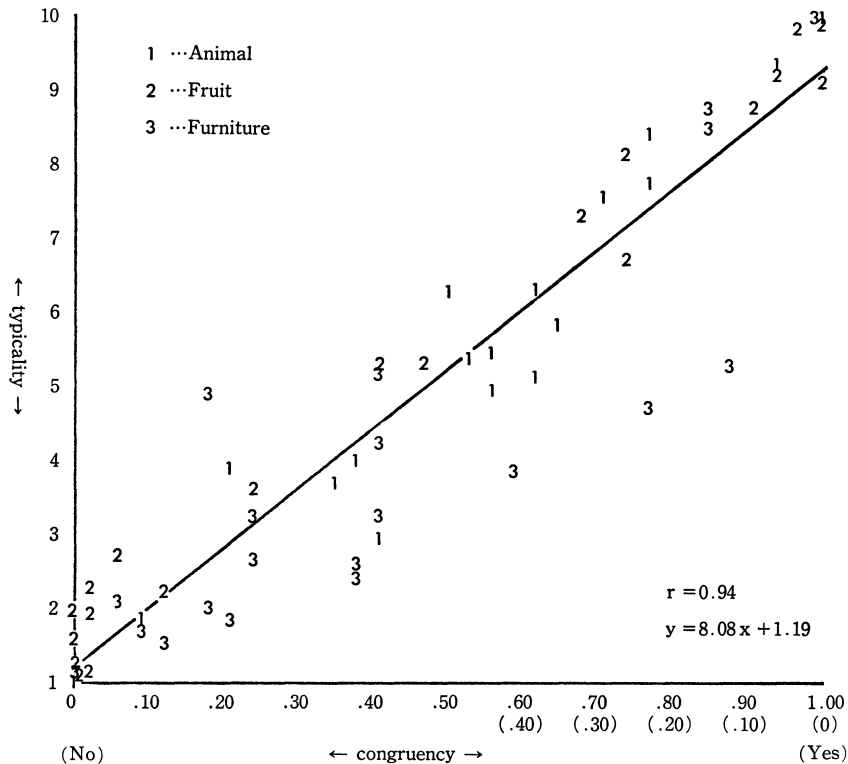
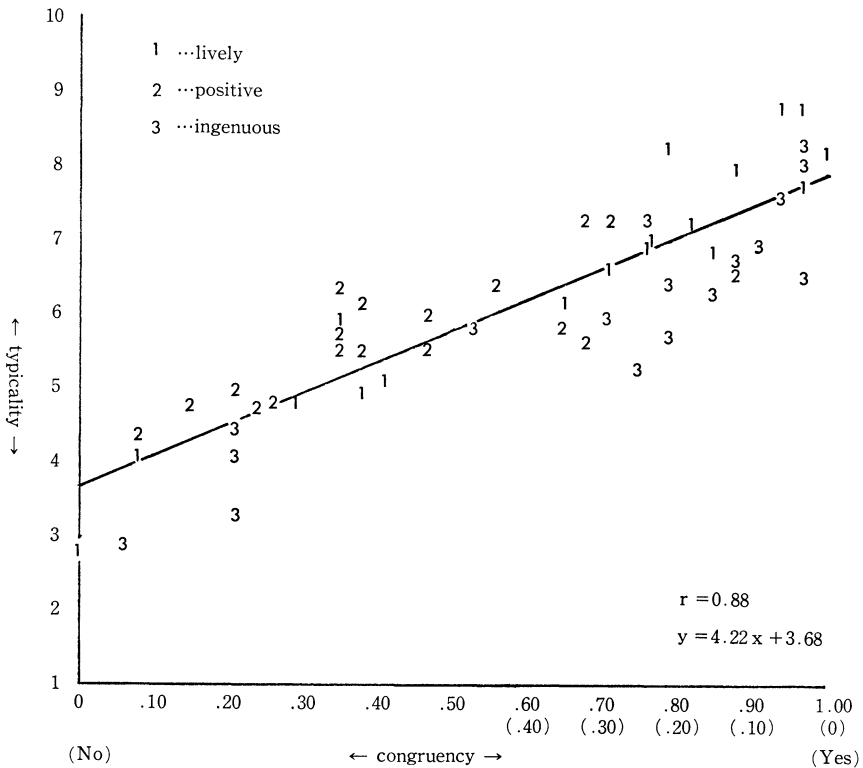Fig. 2.   The relation between two ratings (object).

Fig. 3. The relation between two ratings (person).

that "Yes" and "No" are fifty-fifty. It is clear from Fig. 2 and Fig. 3 that the objects which indicate high (low) typicality also show high congruency (Yes or No). On the other hand, there are many objects which indicate middle typicality, and these objects show incongruence at the same time. We have many objects as these sorts. And it shows that our categories have a fuzzy property irrespective of the object quality. Then regression lines of two figures are different from each other. That is to say, at the natural category, typicality of the object which shows consensus between the subjects is near to 1.0 or 10.0. On the contrary typicality is nearly 3.0 or 8.0 at the person category although the object is judged congruently between the subjects. The result shows that person perception is more complex than object perception, and that only few typical objects exist in person category. The man whom everyone thinks lively, also has a calm side on occasion. And having such multiplicity of personal behaviour in mind, we deal with him flexibly. By the way, if we attribute the incongruence to the ambiguity of the object classified in a category, we can decide the fuzziness of the category as the function of the ambiguity of the objects which are included in the category. But if these objects are recognized consistently within the subject, as pointed out by McCloskey et al., we can not regard them as ambiguous objects. Then we deal

with the relation between inter-subjects congruency and intra-subject consistency at the categorical judgment in the next experiment.

EXPERIMENT II

METHOD

Thirty-four female students of Morioka Junior College evaluated mutual impressions to each other. Subjects are different from those in Experiment I. Trait adjectives used in this experiment were as follows; lively, warm, positive, selfish, conservative, ingenuous, stable, rational, untidy, and serious. Sixteen persons were rated by these 10 traits. Ten persons were identical through all adjectives, and 6 remaining persons differed in each trait. Subjects were instructed to rate the congruency of 160 pairs by the same procedure as in the Experiment I. Next, they thought of an antonym of each adjective. Then using seven points scale which had the adjective on the left pole and its antonym on the opposite pole, they rated the typicality of 16 stimulus persons. And one week later, the identical procedures were repeated. The result was arranged only in common target persons.

RESULTS

There was a high correlation again between the congruency rating and the typicality rating (Fig. 4). Though the typicality rating was made by scales more familiar to the subject, relatively atypical judgment as mentioned before was observed again. Fig. 5
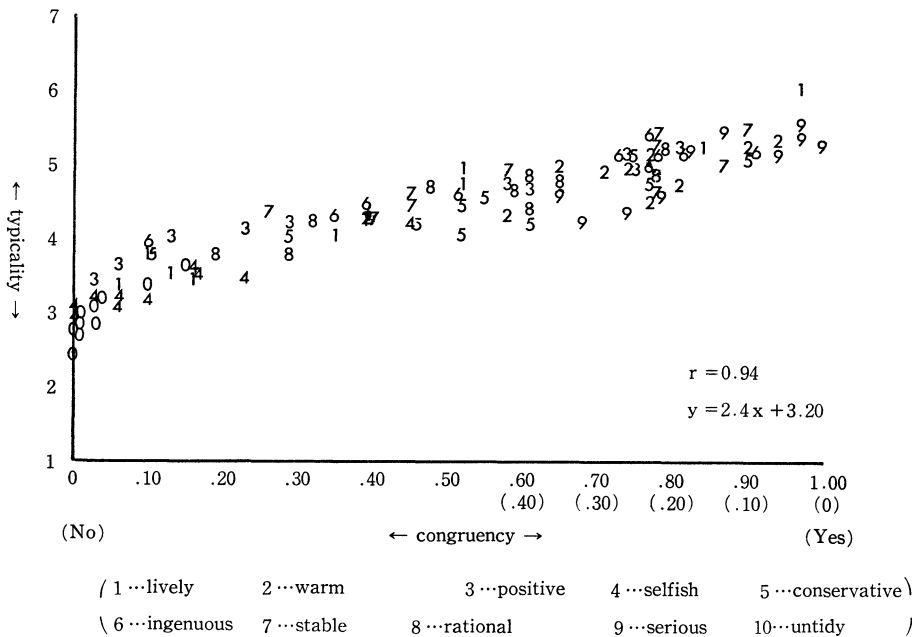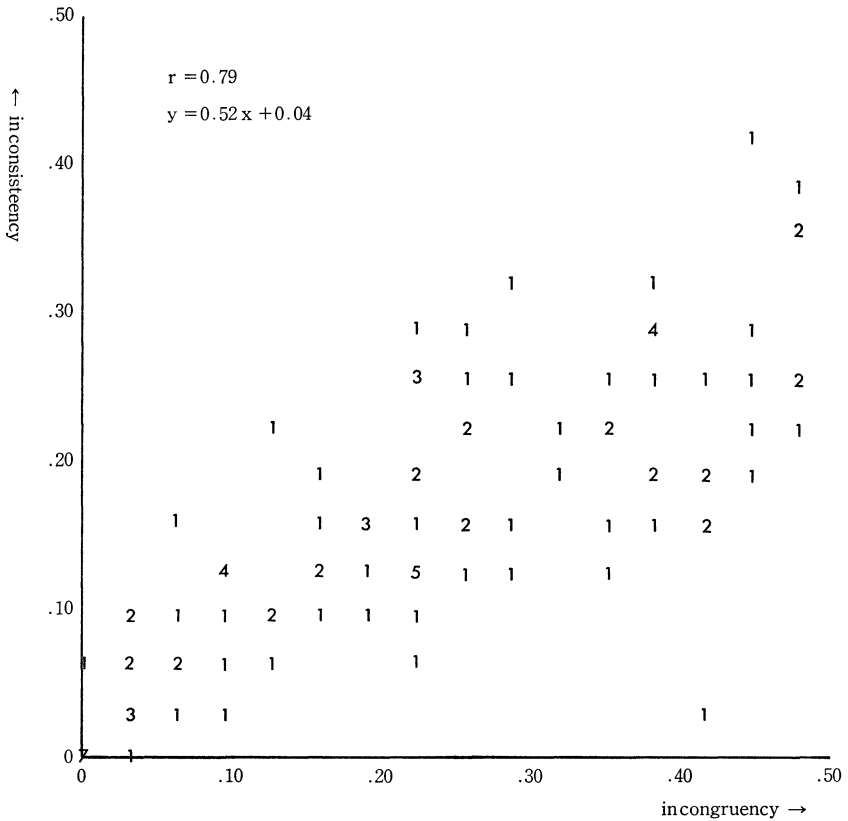

Fig. 4. The relation between the congruency rating and the typicality rating (Experiment II).

r = 0.79
y = 0.52 x + 0.04

↑ inconsistency

.50
.40
.30
.20
.10
0

incongruency →

0   .10   .20   .30   .40   .50

*Each figure indicates the number of responses which shows identical value.

Fig. 5. The relation between inter-subjects congruency and intra-subject consistency.

shows the relationship between inter-subjects congruency and intra-subject consistency. A horizontal line shows incongruence. The maximum value (0.5) means the lack of consensus, in other words, it is the point that Yes and No responses are devided into half. On the other hand, a vertical line shows inconsistency, that is the ratio of the subjects changing their judgment from Yes to No (or inverse order) to all subjects. It is clear from Fig. 5 that congruency and consistency are highly correlated with each other. That is to say, the object lacking in consensus of judgment is also regarded as intangible in one's image. Again it can be attributed to the fuzziness of person category.

The more the object shows incongruence and inconsistency, the more it becomes fuzzy in attribution to the category. Considering each category, some of them as "conservative" or "rational" seem to have a lot of fuzzy objects. On the other hand, they are few in the category as "warm" or "untidy" (Fig. 6). The former categories do not have a main function in this experimental situation. That is to say, at the situation of mutual evaluation between female students, discrimination by these categories

becomes more ambiguous. Thus we can understand cognitive property of the particular social group through investigating what kind of category shows what degree of fuzziness in it. Moreover, if an object is attributed ambiguously to most of categories, the total image of it becomes more ambiguous than the others. For example, Fig. 7 shows the constellation of ratings about two stimulus persons, Miss A(●), and Miss B(▲). In this case, A seems to be imaged more ambiguous than B. And it is possible to determine the ambiguity of one's image by such a method. Considering the validity of this conception the author deals with the relationship between the familiarity with the target person and the ambiguity of his image in the next experiment.
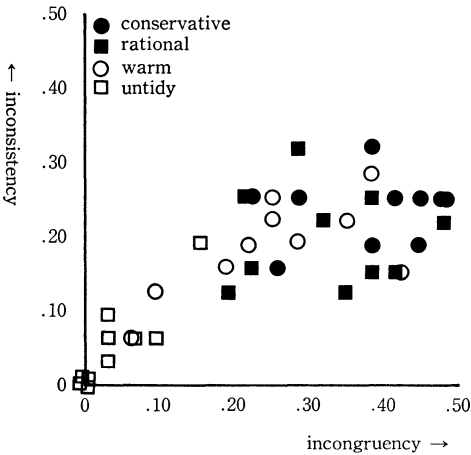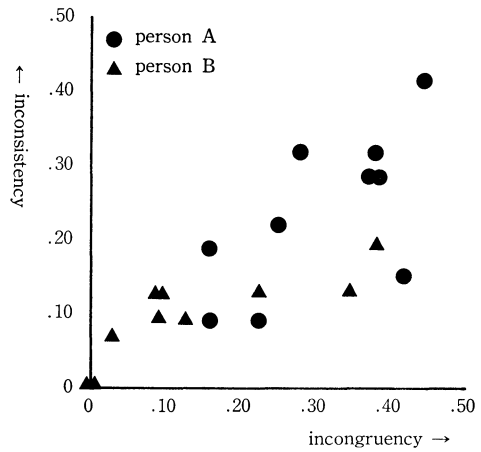

Fig. 6. The rating constellation on some categories.

Fig. 7. The rating constellation about two persons.

EXPERIMENT III

METHOD

Subjects were 10 female students of Morioka Junior College. They were instructed to rate 12 common friends (female) and 12 unknown persons (male and female in half) by 5 adjectives as follows; lively, conservative, cold, ingenuous, and passive. The unknowns were presented by color slide (a full-faced upper half figure). The task was the congruency rating (Yes-No). One week later, the same procedure was repeated again.

RESULTS

Incongruence and inconsistency were calculated separately by the same way as in Experiment II. Each result is shown in Fig. 8 (friends) and Fig. 9 (unknowns). It is clear from the comparison of two figures that both of incongruence and inconsistency increase at the ratings of the unknowns. In general, our images of "friends" seem to be clearer than that of "unknowns". The result shows, therefore, that it is reasonable
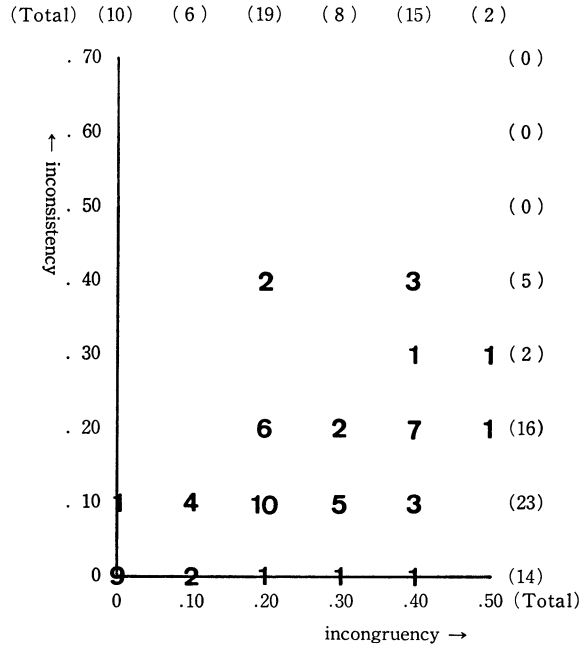
(Total) (10) (6) (19) (8) (15) (2)

↑ inconsistency

.70   (0)

.60   (0)

.50   (0)

.40   2   3   (5)

.30   1   1 (2)

.20   6   2   7   1 (16)

.10 1   4 10   5   3   (23)

0 9   2   1   1   1   (14)

0   .10 .20 .30 .40 .50 (Total)

incongruency →

Fig. 8. The rating constellation about the friends.

(Total) (4) (10) (8) (10) (22) (6)

↑ inconsistency

.70   1   (1)

.60   1   (1)

50   3   (3)

.40   2   3   2   (7)

.30   1   2   9   1 (13)

.20   2   4   3   2   4 (15)

.10 3   4   1   1   5   1 (15)

0   3   1   (5)

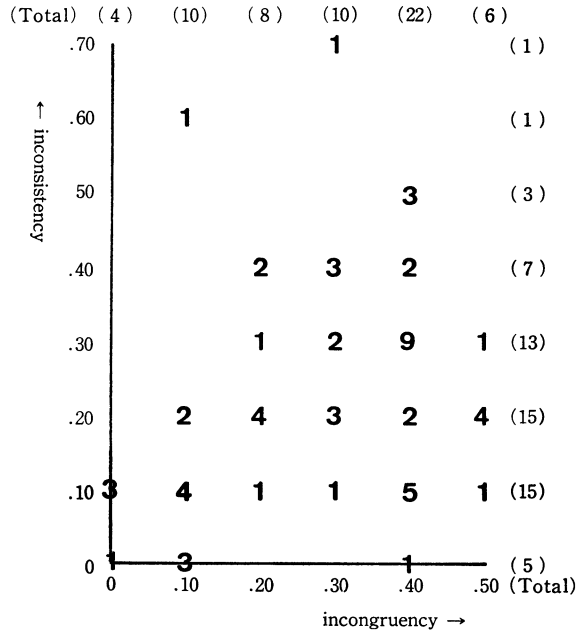0   .10 .20 .30 .40 .50 (Total)

incongruency →

Fig. 9. The rating constellation about the unknowns.

to determine the ambiguity of one's image by measuring the degree of incongruence and inconsistency.

DISCUSSION

From three experiments described above, it may be concluded that person categories have fuzzy property. In addition, it becomes clear that the judgment on person categories is more ambiguous than that on object categories. And inter-subjects congruency and intra-subject consistency were correlated highly in person categories. Moreover, it is reasonable to regard an object image as ambiguous when it was attributed fuzzily to many categories. At the same time, using the concept of fuzziness, we can know what category importance is attached to in a particular social group. Person categorization, and then person perception, has such an ambiguous character. It seems to be an empirical strategy to cope with complex stimulus to let the image ambiguous. In this paper incongruence and inconsistency are used for the approach to the ambiguity but some other methods must be considered for the problem.

Lastly, the present writer refers to three studies in relation to the problems of this work. Kelly (1955) emphasized originality of individual cognitive system. If we look over the Rep-test which was devised in order to know one's cognitive property, it seems to be quite all right to regard one's "construct system" as a hierarchical category system. If we suppose that our categories have fuzzy property, we can determine the ambiguity of total cognitive system. We must investigate the relation between the ambiguity and some cognitive styles such as cognitive complexity or ambiguity tolerance. On the subject of ambiguity tolerance, Budner (1962) indicated three ambiguous situations which were characterized by novelty, complexity, insolubility. In this paper, ambiguity is defined as the membership of the category, and we must investigate the difference of ambiguity in these situations. Moreover, it is necessary to take into consideration Kelley's attribution model (1967) which deals with the problem of congruency and consistency. Experiment III shows that ambiguity decreases in proportion to the increase of intimacy. The tendency is remarkable especially in the consistency. It can be said that the image of the friendly person is stable within an individual but different from each other. When we consider the cause of it, Kelley's concept of distinctiveness may be suggestive for us. That is to say, the property of the object relates with the ambiguity of one's image as well as the individual cognitive property. Further investigations are necessary on the basis of the present study.

REFERENCES

Budner, S. **1962** Intolerance of ambiguity as a personality variable. *Journal of Personality*, **30**, 29–50.

Canter, N. & Mischel, W. **1979** Prototypes in person perception. In: L. Berkowitz (ed.), *Advances in experimental social psychology* (vol. 12). New York: Academic Press, pp. 3–52.

Kelly, G.A. **1955** *The psychology of personal construct.* New York: W.W. Norton.

Kelley, H.H. **1967** Attribution theory in social psychology. In: D. Levine (ed.), *Nebraska*

Symposium on Motivation (vol. 15). Lincoln: University of Nebraska Press, pp. 192–238.

McCloskey, M.E. & Glucksberg, S. **1978** Natural categories: Well defined or fuzzy sets? *Memory and Cognition*, 6, **4**, 462–472.

Zadeh, L.A. **1965** Fuzzy sets. *Information and Control*, 8, 338–353.