Female perception of risk with regard to cultural background

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Female perception of risk with regard to cultural background*

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Abstract

Cross-cultural studies showed that cultures had influence on risk perceptions. The research presented here focused on the female perception of risk, since previous studies underline some gender difference. We studied risk perception of Slovenian and Japanese female students. As a tool to detect empirically based information on subjective meanings of concept *risk* we used Associative Group Analysis (Szalay and Brent, 1967). From hundreds of free associations on the *risk* that were given by the students we detect the common characteristic by their categorization. We found some difference in semantic saturation of particular categories between the compared groups of students. In order to gain an understanding about female risk perception we have carried out Survey on Attitudes toward Health, Life, and Science and Technology (Tsuchida, Pergar-Kuščer, and Englander, 2003). The effects of implicit attitude structures and affect on the risk perception were analyzed through the Linkage-Model.

Key words: risk perception, affect heuristics, semantic representation, value system, female undergraduates, cross-cultural comparison

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Introduction

Our interest is in the cross-cultural difference and similarity between Slovenia and Japan on the female undergraduates affective and rational risk perception in combination with the Schwartz's value system [cf. Schwartz, 1997].

Values are formed by learning from the environment. In the present study the structure of the value systems of the samples emerging from two distinct cultures, the Japanese – by the stereotype group oriented and Slovenian – by the stereotype individualistic, has been investigated and compared. The values could be conceived as general and relatively consistent ideations about goals and events which are highly estimated and refer to broad classes of subordinated objects, actions and relations, and which direct our interests, attitudes and our behavior. Numerous categories of values at different levels of hierarchy have been identified in the theoretical and empirical investigations (Schwartz and Bilsky., 1990; Musek, Pergar-Kuščer, and Bekeš, 2000). The study of values is important as a means of understanding better the cross-cultural perspective of human behavior. The conceptualization of culture, however, includes both cross-cultural differences as well as intercultural universals. The role of the values in a given cultural context is important not only for the realm of interpersonal relationship but also for the formation of the perception of risk.

The concept "risk" has two aspects of dangers and benefits. Decision makings on risks have two processes of judging dangers and judging benefits. Besides, since "risks" are future events, we have to evaluate the occurrence probabilities of the dangers and benefits as well as their magnitudes. Decision makings on risks are very complicated tasks for us human beings, so we usually use heuristics when we think about risks. The heuristics are, for example, a) ignoring benefits or dangers, b) fixing probabilities as 100% or 0%, c) judging only from the dreadfulness of results, and so on. On this study we focus on the "affect heuristics" of risk judgments (Tsuchida and Itoh, 2003), which assumes that we would use a single "good-bad" criterion instead of the double criteria of danger and benefit evaluation on the process of risk decision makings (figure 1).

Risk Type (Tsuchida & Itoh,2003) and Affect Heuristics

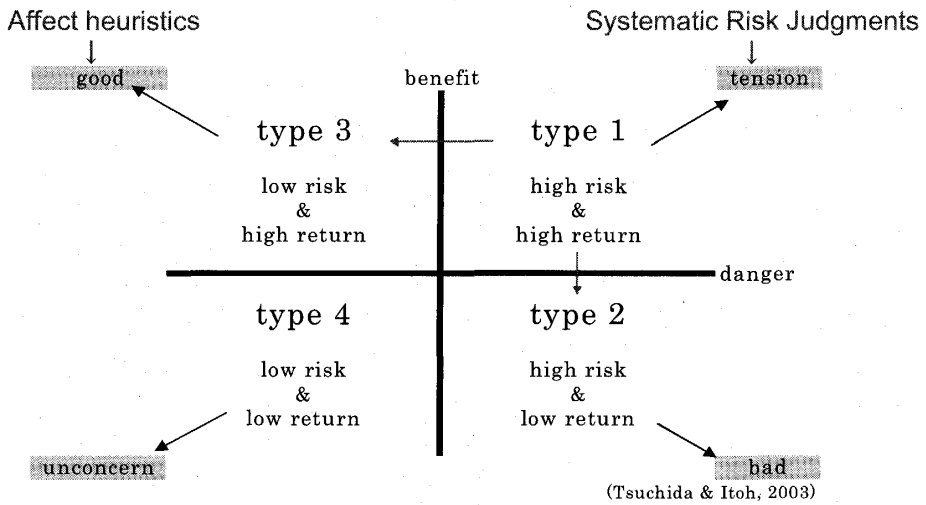

figure 1

Tsuchida and Itoh (2003) categorized risks into four types. Type 1 risks are perceived beneficial and/but dangerous [high risk and high return], which would bring us psychological tension and would lead us to cognitive overload, however, on systematic and rational risk judgment processes, risks would be perceived as Type 1. Type 2 risks are perceived as risks with dangers and without benefits [high risk and low return], which we usually think as bad things. On contrast, Type 3 risks are perceived as risks with benefits and without dangers [low risk and high return], which we usually think as good things. In daily lives, we often think about risks in the way of estimating their badness or goodness, which Tsuchida and Itoh (2003) called "affective heuristics". Type 4 risks are perceived as risks with no benefits and no dangers [low risk and low return], which we would pay little attention.

Tsuchida, Pergar-Kuščer, and Englander (2003) reported that the aggregated estimation of dangers and benefits made by female undergraduates showed that most of risks were perceived as Type 2 or Type 3 and there were no Type 1 risks both in Japan and in the United Kingdom (figure 2). They discussed that the affective heuristics of risk perception brought the results.

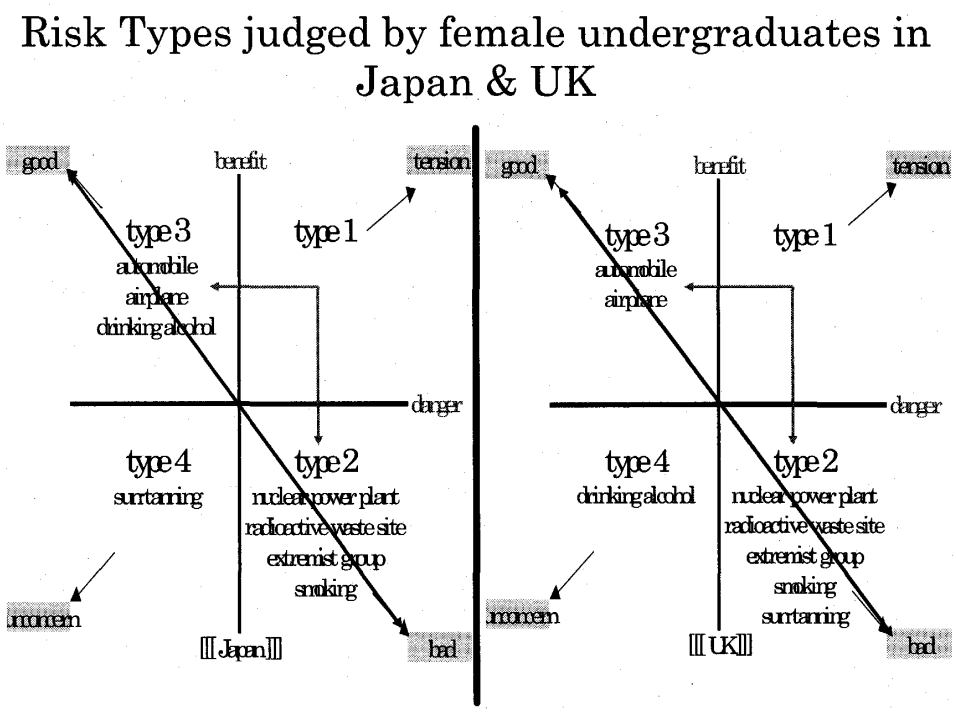

figure 2 (Tsuchida, et al., 2003)

Linkage-Model (Tsuchida, 1996, 2001; Tsuchida and Itoh, 2003) proposed that we would have association with the (target) risk in form of adjective [e.g. fearful, bad, beautiful] when we made an affective decision, and in contrast we would have association with it in form of noun [e.g. experts, electricity] when we made a rational decision.

Fiedler and Semin (1996) argued that abstract words including adjective and noun [e.g. fearful, bad, beautiful, danger, fear] represent affective cognition, and concrete words represent rational cognition.

Tsuchida, Kitada, and Ato (2000) collected the associated words with NUCLEAR POWER from the randomly sampled inhabitants (N=1,001) in the Kansai area, and they reported that words "danger" and "accidents" were associated most frequently and the words were connect to affective evaluation.

Therefore, when we make an affective decision on NUCLEAR POWER, we would have associations with it in form of the adjective [affective-adjective LM] or in form of the words such as "danger" or/and "accidents" [affective-noun LM]. And when we make a rational decision on it, we would have associations with it in form of the noun excluding the words such as "danger" or/and "accidents" [rational LM].

Linkage-Model assumes that on an affective decision making process "valence (negative or positive)" would be salient in association with target risk object. The linguistic representations of the negative valence would be BAD, DISLIKE, OPPOSE, etc. and those of the positive valence would be GOOD, LIKE, APPROVE, etc. (figure 3). The valences would be of great help and bring some biased perception on making risk judgments and/or decisions as affect heuristics. Linkage-Model also assumes that on systematic / rational decision making processes, both negative valence and positive valence would be salient [risks as Type 1], or neither negative valence nor positive valence would be salient [risks as Type 4].

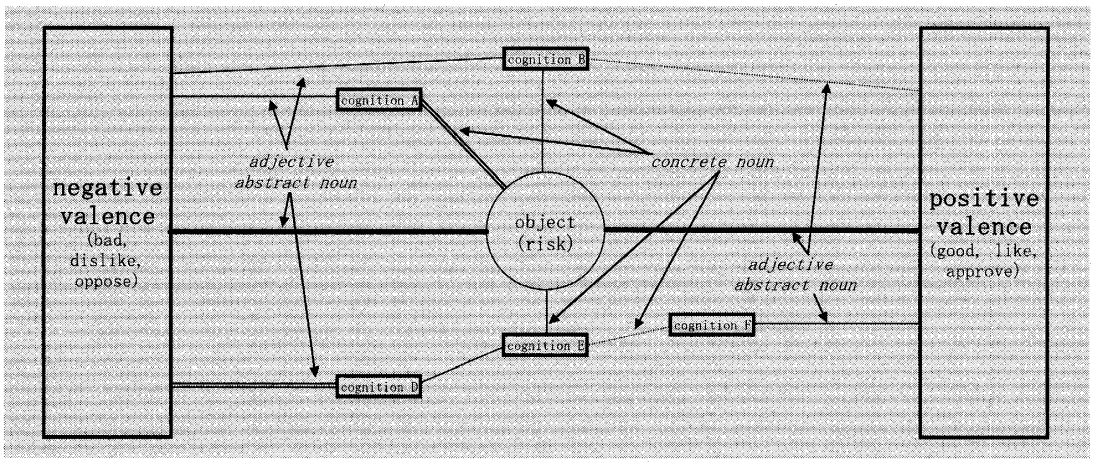

fig. 3-1 an example of "systematic/rational judgment" [a risk as Type 1]

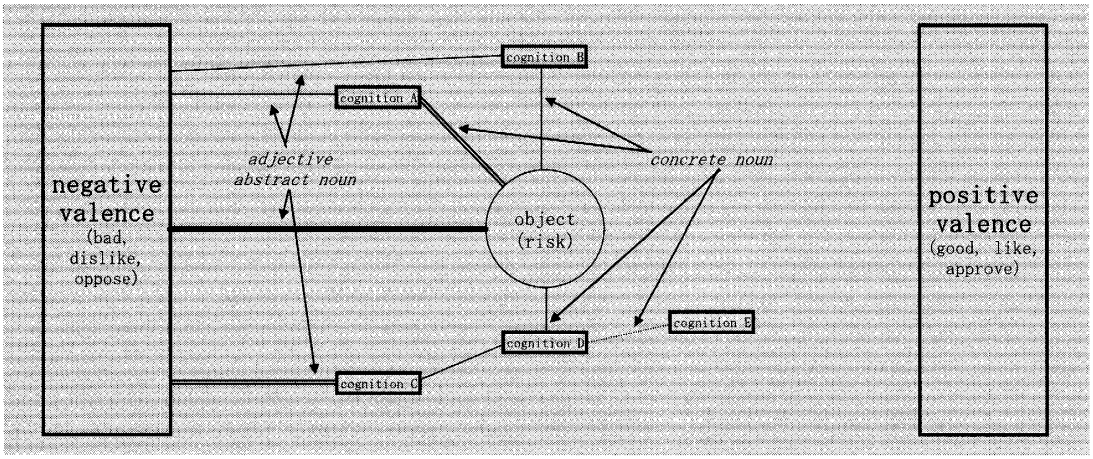

fig. 3-2 an example of "affect heuristics" [a risk as Type 2]

figure 3. Linkage-Model of "systematic/rational judgment" & "affective heuristics"

Objective

To estimate the similarity and differences in the understanding of the concept of RISKS between female students from Japan and from Slovenia we made some semantic structure comparison of the concept "risk".

Cross-cultural studies on risk perceptions showed that cultures had influence on risk perceptions [cf. Englander et al, 1986; Tigen, Brun, and Slovic, 1988; Goszczynska, Tyszka, and Slovic, 1991; Hirose, Slovic, and Ishizuka, 1993; Hirose, Ishizuka, and Tsuchida, 1995; Tsuchida, Kuščer, and Englander, 2003]. To understand the cultural influences we focused on Schwartz's value system. Schwartz (1997) proposed a "value system" with 10 components of Benevolence, Universalism, Self-Direction, Stimulation, Hedonism, Achievement, Power, Security, Conformity, and Tradition.

Method

Participants

One hundred seventeen female students participated in the study of group association [AGA] and two hundred and ninety-three female students answered the Survey on Attitude toward health, life and science and technology: 156 Japanese and 137 Slovenians. The students were from the Kansai University – Department of Psychology and Department of Sociology and from University of Ljubljana – Faculty of Education.

Materials

a) Associative Group Analysis (AGA)

AGA Technique developed by Szalay and Brent in 1967 draws inferences from the distribution of word associations (in our case to the word "risk") chosen from members of two groups in one minute.

b) Linkage-Mode measurement:

A list of 27 words (adjectives and nouns) was presented to the respondents and they pointed out all word(s) that reminded them of the "nuclear power", and then they answered a word that reminded the most of it.

[adjectives]: sad, wonderful, clean, good, weak, frightening, dirty, strong, happy, bad, reliable, unreliable, needless, necessary, fearful

[nouns]: electricity, accidents, radio activity, war, atomic bomb, affluent life, experts, danger, science & technology, state power, concealment, safety.

c) Schwartz's value measurement:

Slightly modified Schwartz's value measurement was used with 5-ponint scales.

[Benevolence]: It is important to me to respond to the needs of others. I try to support those I know.

[Universalism]: I believe all the world's people should live in harmony. Promoting peace among all groups in the world is important to me.

[Self-Direction]: It is important to me to make my own decisions about what I do. I like to be free to plan and to choose my activities for myself.

[Stimulation]: I like surprises. It is important to me to have an exciting life.

[Hedonism]: I really want to enjoy life. Having a good time is very important to me.

[Achievement]: It is very important to me to show my abilities. I want people to admire what I do.

[Power]: It is important to me to be in charge and tell others what to do. I want people to do what I say.

[Security]: It is important to me to live in secure surroundings. I avoid anything that might endanger my safety.

[Conformity]: I believe that people should do what they are told. I think people should follow rules at all times, even when no-one is watching.

[Tradition]: I think it is best to do things in traditional ways. It is important to keep up customs I have learned.

Procedure

We collected associations on different word concepts related to life and risk from the female students from both countries 2004. Here is presented only the two groups word associations on the stimulus word "risk" as a crucial concept for understanding results we previously (2002) got from the students answers to above mentioned "*Survey on Attitude toward health, life and science and technology*". Although the groups of students were not the same we want to get some empirically based information on subjective meanings on the native speaker's belief system connected with this concept.

In AGA, each response (association) is given a score indicating weighted order of its occurrence and is inserted after the content analysis to one of the categories. The scale of scoring was elaborated on the basis of stability of the rank of responses.

In Linkage-Model analysis, we coded the adjective words as the affective-adjective LM, the words of "danger" and "accident" as the affective-noun LM, and the noun words excluding the words of "danger" and "accident" as the rational LM. Two indexes of 1) the most reminded word and 2) the number of reminded words were in analysis for each LM.

Results

a) Risk categories and most frequent associations with "risk": AGA (Associative Group Analysis)

The free associations with "risk" were taken into AGA (Associative Group Analysis. The associations were coded into eight categories: "Physiologic Reaction" (e.g. disease, pain), "Psychological Expression" (e.g. discomfort, fear, courage, bravery, uncertainty), "Consequences" (e.g. death, accident, victory), "Activities"(e.g. adventures, gambling), "Substances" (e.g. alcohol, sweets, cigarettes), "Objects and Events" (e.g. stock-market, vehicle, snake, war), "Unknown and New" (e.g. life, love affair, success), "Social Relations and Education" (e.g. teacher, friend, exams).

The most of the associations given by both the Japanese and Slovenian female students were in the categories of "Consequences", "Psychological Expression", and "Activities". The major differences were in these tree categories. The Japanese female students gave more associations of "Consequences", and "Activities", and less of "Psychological Expression" than the Slovenian female students [see. table 1 and figure 1]. In total, the difference between the Japanese female students and the Slovenian female students was significant [χ^2=103.7, 7 d.f. p< .001].

Table 1. Rrisk categories and most frequent associations given by compared groups of female students

Categories	*Japan female students*			*Slovenian female students*		
	Associations	*Weights*	*%*	*Associations*	*Weights*	*%*
I. PHISIOLOGIC REACTION	disease, pain	12	2	adrenalin, pulse, disease, pain, perspiration, short wind	49	4
II. PSYCHOLOGIC EXPRESSION	compensation, independence discomfort, courage, ...	126	14	fear, bravery, determination, self-confidence uncertainty, ...	328	27
III. CONCEQUENCES	loss, danger experience, death, injury, possibility, ...	294	33	accident, death possibility, difficulty, victory, result, ..	248	20
IV. ACTIVITIES	adventures, competition, gamble, action work, ...	191	22	adventures, extreme sports, gambling, driving, ...	200	16
V. SUBSTANCES	alcohol, food, sweets cigarettes, medicine, ...	35	4	alcohol, contraception pills, cigarettes, pollution	27	2
VI. OBJECTS AND EVENTS	stock-market, car, explosion, obstacles, war	87	10	vehicle, snake, mountain, stock-market hurricane, hail	132	11
VII. UNKNOWN AND NEW	life, love affair, necessary for success, merit	75	8	life, destiny, love, unknown, intention, thoughtlessness	149	12
VIII. SOCIAL RELATIONS AND EDUCATION	teacher, friend, unit with people, career in education	71	7	school, exams, test, friendship, family	99	8
		891	100		1232	100

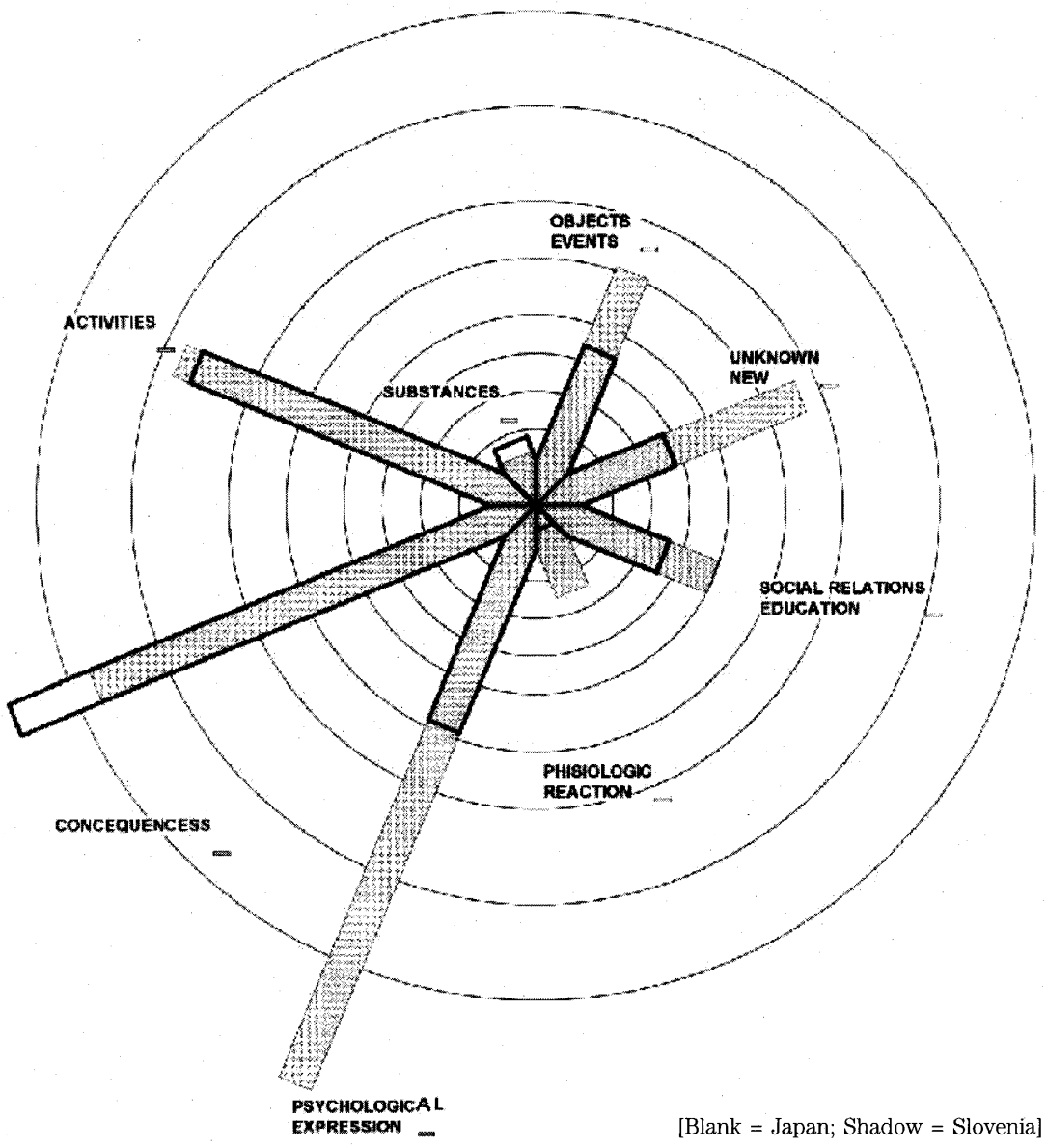

figure 4. SEMANTOGRAM: Semantic saturation of concept RISK with eight categories

b) Cross cultural difference in affective and rational responses

The reminded words with "Nuclear Power" were categorized into affective-adjective responses (= adjective words), affective-noun responses (= "danger" and "accident"), and rational responses (= noun words excluding "danger" and "accident") [Linkage-Model measurement]. Affective-noun responses and rational responses showed that the Japanese female undergraduates had more affective Linkage-Models than the Slovenian ones.

However, no significant differences were found on the affective-adjective responses [see. table 2 and table 3].

Table 2. The most reminded word of NUCLEAR POWER

	Slovenia	Japan	$\chi 2$	d.f.	
affective-adjective	10.2%	14.1%	1.02	1	ns
affective-noun	18.2%	26.3%	2.70	1	p<.10
rational	69.3%	58.3%	3.81	1	p<.10

Table 3. N of reminded words of NUCLEAR POWER

	Slovenia	Japan	t-value	d.f.	
affective-adjective	2.54	2.58	0.03	270.4	ns
affective-noun	1.33	1.64	4.16	291	p<.01
rational	5.20	4.46	3.43	291	p<.01

c) Cross cultural difference in values

In general, both Slovenian and Japanese female students sought Benevolence, Universalism, Self-Direction, Hedonism, and Achievement [see. figure 2]. They did not want Power. In comparison, the Slovenian female students sought more Benevolence, Universalism, Self-Direction, Stimulation, and Power than the Japanese. The Japanese female students sought more Hedonism, Conformity, and Tradition than the Slovenian [see. table 4].

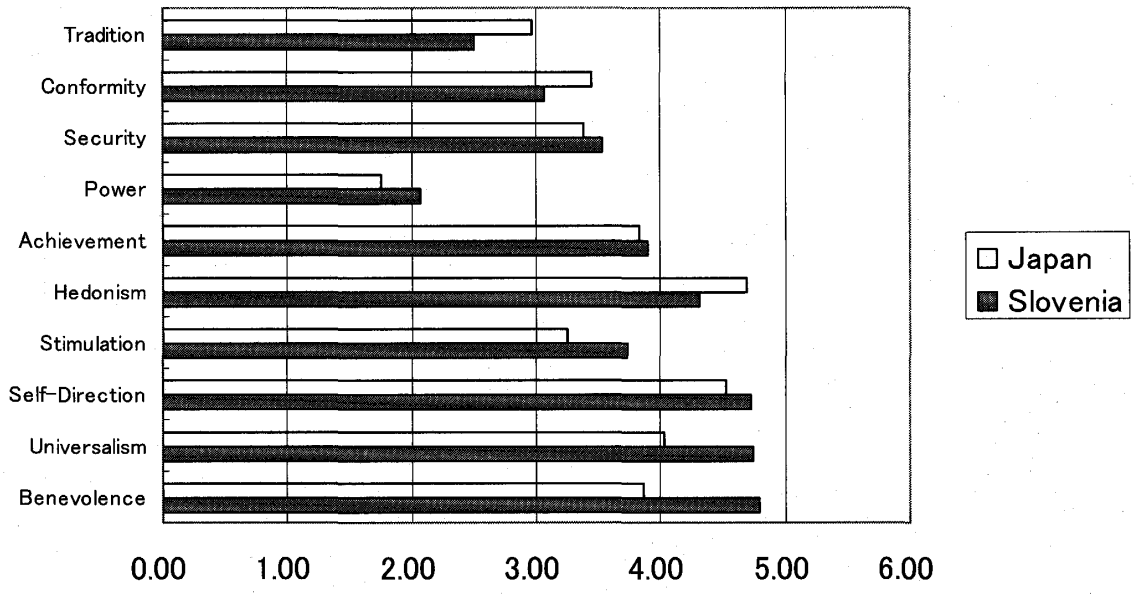

Figure 5. Cultural difference of values

Table 4. Cultural differences of values

	Slovenia	Japan	t-value	d.f.	
Benevolence	4.79	3.87	10.96	249.5	***
Universalism	4.74	4.03	8.22	248.7	***
Self-Direction	4.72	4.52	2.75	290.5	**
Stimulation	3.72	3.25	3.51	289.5	***
Hedonism	4.31	4.69	-4.11	234.9	***
Achievement	3.90	3.83	0.59	291	
Power	2.07	1.76	2.69	291	**
Security	3.53	3.38	1.35	291	
Conformity	3.07	3.44	-2.84	291	**
Tradition	2.50	2.97	-3.67	291	***

***: p<.001, **: p<.01, *: p<.05

d) Cross cultural difference in correlation between the "associations" and the "values"

The number of reminded affective words with "Nuclear Power" [affective-adjective LM & affective-noun LM] and the number of reminded rational words with it [rational LM] had a few correlations with values. And some cross-cultural differences were shown in the correlations [see. table 5 and table 6].

Among the Slovenian female rational LM correlated with Universalism and Self-Direction, while among the Japanese female it had no correlations. Affective-adjective LM and affective-noun LM had no correlation among the Slovenian, while Affective-adjective LM correlated with Achievement among the Japanese.

Table 5. Correlations between N of reminded words and values [JPN]

	affective-adjective LM	affective-noun LM	rational LM
Benevolence	0.00	-0.09	-0.06
Universalism	0.12	-0.02	0.04
Self-Direction	0.08	-0.04	0.01
Stimulation	0.08	0.06	0.09
Hedonism	0.10	0.02	-0.06
Achievement	0.18 *	0.00	0.07
Power	0.04	-0.10	-0.14
Security	0.14	-0.03	0.03
Conformity	0.12	0.07	0.13
Tradition	0.00	0.10	0.13

*: p<.05

Table 6. Correlations between N of reminded words and values [SLO]

	affective-adjective LM	affective-noun LM	rational LM
Benevolence	0.17	0.08	0.14
Universalism	0.07	0.15	0.20 *
Self-Direction	-0.05	0.05	0.17 *
Stimulation	-0.11	-0.17	-0.10
Hedonism	0.00	-0.03	-0.05
Achievement	0.05	0.05	0.14
Power	-0.11	0.03	0.06
Security	0.16	0.02	-0.01
Conformity	-0.07	-0.07	-0.15
Tradition	0.03	0.04	0.00

*: $p<.05$

Discussion

As our understanding of the world grows we learn from our experiences as well as from experiences of others, which are reflected in the language. Language is a tool for expressing meaning. The common denominator of language is not communication but meaning as a mental representation – an idea that includes a description of important properties of a concept. As a tool to detect empirically based information on subjective meaning of the word "risk" we used group associations. From hundreds of free associations on this abstract concept that were given by the female students we found common characteristics of its meaning. Since AGA is an indirect technique, we found some meanings of risk concept which students were not aware of, and could therefore not have been discovered by structured questionnaires. We found some differences in semantic saturation of particular categories: Psychological expression, Consequences and Unknown and new. The Japanese students had more associations in categories with denotative meaning – with more logical contents.

And we focused on the affective and rational aspects of language which Linkage-Model suggested association in form of the adjective and specially affected words such as "danger" and "accident" for nuclear power reflected affective thinking and association in the (concrete) noun reflected rational thinking. We found that the Japanese female undergraduates did more affective thinking about nuclear power than the Slovenian. The difference may be reflected by the experience or history of atomic war in Japan. We also

had some insights of cultural differences that rational representation of nuclear power correlated with the values of universalism and self-direction only in Slovenia and that affective representation of it correlated with the value of achievement only in Japan.

We should stress that this results are preliminary, need some further investigations. Until now it is only a part of extensive research which is going on.

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