AN EXPERIMENT ON GROUP DECISION-MAKING USING A BUSINESS GAME: AN INTERNATIONAL COMPARISON OF MBA STUDENTS IN JAPAN, CHINA, AND RUSSIA

Mitsuru Morita
Aoyama Gakuin University
morita@gsim.aoyama.ac.jp

Masahiro Horiuchi
Aoyama Gakuin University
horiuchi@sccs.aoyama.ac.jp

Chiaki Iwai
Aoyama Gakuin University
iwai@gsim.aoyama.ac.jp

Masatsugu Oshima
Aoyama Gakuin University
osh@sccs.aoyama.ac.jp

Zhuchao Yu
Northeastern University
yuzhuchao@163.com

ABSTRACT

The purpose of this research was to conduct an experiment on MBA students in Japan, China and Russia using a problem-solving business game, and thereby clarify differences between countries in group decision-making. The first half of this paper describes previous studies of group decision-making experiments using business games, and previous research on business games in Japan, China and Russia. The second half introduces and discusses a group decision-making experiment conducted using a business game called MBABEST21. This experiment revealed an interesting difference between decision-making in Japan and China.

INTRODUCTION

The purpose of this paper was to conduct an experiment on MBA students (Flex Time, all with work experience) in Japan, China, and Russia using a problem-solving business game, and thereby clarify how they differ in group decision-making. One of the authors has previously shown the possibility that mutual understanding within teams is promoted as a result of experiments to improve the effectiveness of group decision-making using business games (Iwai, 2009). This paper is based on that earlier paper, and attempts to draw international comparisons by determining whether MBA students in different countries differ in their group decision-making.

Business games are widely used as tools for experiential learning, where students take part in simulated management in the classroom. In many cases, the participants form teams, and the game proceeds through group decision-making. There are quite a few reported cases of experiments on group decision-making problems, using business games as the setting for group decision-making, but no attempts have been made to elucidate group decision-making in different countries. There has been an attempt to measure and compare differences in value judgments of foreign students after a business game at a university in the US, where students gather from all over the world (Halterman and Sampson, 1995). However, the sample size was limited, and students communicated with each other in

English. This paper introduces a novel feature. It compares group decision-making in a business game by student groups made up, respectively, of only Japanese, Russian and Chinese students who communicate in their native languages. The exact same experimental design is used in each country.

The composition of this paper is as follows. First, the analytic framework of the paper is presented. This is followed by a basic overview of previous experiments on group decision-making using business games, and practical research on business games in Japan, China, and Russia. Next, we state our hypothesis, discuss the experimental design, and attempt to comparatively analyze the experimental data. The final discussion summarizes the results of the experiment, and considers issues for the future.

DECISION-MAKING MODEL AND PREVIOUS STUDIES

In the context of gaming and simulation, business games are conducted by teams in many cases, and thus can be regarded as group decision-making problems rather than individual decision-making problems. Since the goal in this paper is to solve decision-making problems in existing corporate organizations, we primarily use the framework of decision-making theory for management organizations.

Various theories are used in theoretical research on management decision-making. For example, these include Decision Theories such as Game Theory, Organization Theory (Simon 1976, 1996), and the Garbage Can Model (Cohen, March, and Olsen 1972) . The problem addressed by this paper is improving the effectiveness of group decision-making involving different departments. The game scenario used in the experiment is bringing a new product to market through collaboration between different departments. Group decision-making theory is used as the theoretical framework of this paper, with particular focus on decision theory and organization theory suited to addressing decision-making problems of departments which are relatively limited in this way.

Decision theory and modern organization theory can be regarded as a dichotomy. On one side is decision theory—for example, the model of economic man who selects the rational alternative based on given information, by using rules in accordance with game theory. On the other side is the model of administrative man deriving from modern organization theory established by Simon (1976, 1996) and March and Simon (1958). In this case, humans with bounded rationality simplify the real world and select alternatives by satisficing . In this paper, the model of economic man is called the "closed model" and the model of administrative man is called the "open model." The Simon model is redefined as a new dichotomy.

The closed model corresponds to the classical problem situation of selecting a single alternative from a set of known alternatives, through a rational selection process with respect to a certain clear goal. Since this places almost no emphasis on the environment of the decision-maker, and the complexity of the selection behavior itself, it is a closed model. The open model, in contrast, adopts a more complex view of the decision-making process, and tries to incorporate the decision-maker's adapting and learning in response to the environment.

As shown in Table 1, "maximizing" is the selection principle for the Closed Model, and "satisficing" by the decision-maker is the selection principle for the open model.

When designing a business game, it is assumed that objective variables such as profits and sales will be maximized, and when the game is played the goal is to maximize these variables. This is closed model decision-making and can likely be refuted. On the other hand, calculation is done using the absolute value of variables input by game participants, and the weightings of input variables are not disclosed to participants. In addition, the competing teams do not know what strategies other teams will use. Playing the game this way introduces some open model elements . Even when the same game is played with the same scenario, in some cases everyone makes a profit, and in other cases everyone makes a loss. There are cases where there is large gap between the top and bottom teams, and cases where there is almost no difference at all between teams. Thus there is a mixture of the closed and open model in business game decision-making and results.

PREVIOUS RESEARCH ON GROUP DECISION-MAKING EXPERIMENTS USING BUSINESS GAMES

In many experiments which regard business games as a

Table 1 Closed model and open model

	Closed model	Open model
Purpose	Clear, Known	Includes unclear, implicit elements
Set of alternatives	Set of known things	Set includes unknown things
Ordering of alternatives	Self-consistent	Exploratory comparison
	Comparison of all alternatives	Comparison of only some alternatives
Selection principle	Maximizing	Satisficing
Experiment validity	Formal validity	Practical validity

Table 2 Research on group decision-making using business gaming

Variable	Study	Finding
Grade Point Average (GPA)	McKeney and Dill (1966), Estes and Smith (1979), Vance and Gray (1967)	Positive correlation between high GPA teams and performance.
Grade Point Average (GPA)	Wolfe and Box (1988)	Significant relationship between GPA and cohesion.
Group size	Wolfe and Chacko (1983)	Four-member teams outperformed one- and two-member teams.
Cohesion	McKeney and Dill (1966); Deep, Bass, and Vaughan (1967)	No relationship between cohesion and performance.
Cohesion	Norris and Niebuhr (1980), Miesing (1982)	Cohesive teams perform better.
Conflict	Affisco and Chanin (1990)	No difference in conflict between Decision Support System (DSS) and non-DSS group.
Conflict	Chanin and Schneer (1984)	Personality related to conflict handling behavior.
Information usage	Schroeder and Benbasa (1975), O'Reilly (1982)	Information usage increases with increase in environmental uncertainty.
Performance	Keys, Burns, Case and Wells (1988)	The use of computer-based worksheets led to only marginal improvement in performance over the use of hand-scored worksheets.
Performance	Affisco and Chanin (1989)	No significant relationship between the use of DSS and non-DSS group.
Satisfaction	Wolfe, Bowen and Roberts (1989)	Group cohesion had a significant relationship with the satisfaction of group members with their decisions.

(Dasgupta, 2003)

tool for solving group decision-making problems, and attempt to confirm their validity, university instructors acting as educators measure the educational effectiveness of games, and compare multiple variables (Dasgupta 2003, Table 2). Compared with classroom experiments, there are few reports on experiments in laboratories, or on practical experiments in non-academic settings such as corporations (McKeney and Dill 1966, Estes and Smith 1979, Vance and Gray 1967, Wolfe and Box 1988, Wolfe and Chacko 1983, McKeney and Dill 1966, Deep, Bass and Vaughan 1967, Norris and Niebuhr 1980, Miesing 1982, Affisco and Chanin 1990, Chanin and Schneer 1984, Schroeder and Benbasat 1975, O'Reilly 1982, Keys, Burns, Case and Wells 1988, Affisco and Chanin 1989, Wolfe, Bowen and Roberts 1989). Therefore, it is significant to use the exact same experimental design, and compare group decision-making in a business game by student groups made up, respectively, of only Japanese, Russian, and Chinese students who communicate in their native languages.

USE OF BUSINESS GAMES IN JAPAN, CHINA, AND RUSSIA

The main previous research on business games in Japan, China, and Russia is shown in Table 3.

Business games were introduced to the classroom in Japan at almost the same time as the US. They gradually spread and came into use at many corporations and universities in the 1980s. (Kurosawa 1990, Ichikawa 1993, and Shirai 1996). In China, on the other hand, business games only began to really spread starting in the 2000s, and today games are used in some business administration education but there is room for much broader dissemination (Hornaday 1999, Chang, Jennings, To, and Sun 2005, Chang, Ng, Moon, and To 2005, Chang, Mak, To, and Lau 2009) . In Russia, business games have been used since the 1990s, and since really coming into vogue in the 2000s, game versions have been developed to suit Russian business models (Wolfe 1991, Faria, Dickinson, and Peterson 1996, Rybalsky and Wolfe 1999, Volkov, Klimov, Tugaev, Lysova, and Shoptenko 2004). Thus there are differences in the history of business game adoption in Japan, China, and Russia. However, as noted by Lamont, Volkov, and Shoptenko (2005), there has been sufficient dissemination of business games in Japan, the US and Russia, and experiments can be compared.

Table 3 Research on business games in China, Japan and Russia (USSR)

Country/University	Study	Finding
China, Nankai University	Hornaday (1999)	Chinese students worked hard during competition. One or two people on each team really got involved.
China, Hong Kong Polytechnic University, Zhejiang University	Chang, Jennings, To, and Sun (2005)	A survey of postgraduate students' perceptions reveals that overall the new business venture simulation provides a more successful learning experience than the case method as well as in-company consultancy project.
China, Hong Kong Polytechnic University	Chang, Ng, Moon, and To(2005)	Overall survey results of students are very favorable to business gaming since none of the respondents have been exposed before .
China, Hong Kong Polytechnic University, Xi'an Polytechnic University	Chang, Mak, To, and Lau (2009)	Chinese students showed a great preference to have the computer simulation in their class and have benefited from it .
Japan	Kurosawa (1990)	About half of 40 faculties in management engineering in Japan are using business gaming.
Japan	Ichikawa (1993)	Business games were introduced to Japan in 1958. They are also well-established as a tool for in-house education of corporate managers.
Japan	Shirai (1996)	Proposal of techniques for using business games as tools for building models to enable concrete simulation of individual issues at private firms.
Russia, Europe's Socialist countries	Wolfe (1991)	The use of experiential learning techniques in general and the specific use of American-style, market-based management games, can be of particular interest and value to these nations as they begin to implement perestroika.
Estonia, University of Tallinn, Agricultural University and University of Tartu	Faria, Dickinson, and Peterson (1996)	In a country that has had little experience with sales force management or advertising, it is difficult to draw on real world examples. The simulation provided market place examples.
Russia	Rybalsky and Wolfe (1999)	Although the USSR was a pioneer in the use of management games the realization of the benefits of business games was frustrated by a number of factors associated with the environment fostered by Communism.
Russia	Volkov,Klimov, Tugaev, Lysova, and Shoptenko (2004)	Even in transition economies, such as Russia, speed of changes in "state machinery" is significantly slower than in business sector.
Russia, Moscow	Lamont, Volkov, and Shoptenko (2005)	In the future, localizing IMG version in Russia will have more instruments and decisions within specific management areas, implementation of new distribution channels, extended borrowing.

EXPERIMENTS ON GROUP DECISION-MAKING USING BUSINESS GAMES

This section describes the experiments conducted in this research. First, the experimental hypothesis is stated. Then the business game and scenario used in the experiment, the experimental methods, subjects, and method of collecting data are described.

STATEMENT OF HYPOTHESIS

There are various approaches to classifying the "groups" in group decision-making. This paper classifies them into two types—formal groups and informal groups—and focuses analysis on formal groups, i.e., groups recognized in the formal structure of an organization. Formal groups are classified into two types, command groups and task groups. A command group consists of members belonging to a chain of command, i.e., a single superior and subordinates. A task group consists of members who are engaged together in a certain task. The experiment in this paper is based on formal command groups (hierarchical organization). Before the game starts, students in each team are asked to decide on their own on a CEO (to be the superior) and a CMO (Chief Maketing Officer), CPO (Chief Product Officer), CFO (Chief Financial Officer), and CRO (Chief Research & Development Officer) as roles to handle other tasks.

The problem addressed by this experiment is the possibility of eliminating adverse effects of group decision-making and stimulating effective interaction by adopting a business game as the setting for group decision-making. The hypothesis was formulated as follows. This hypothesis was developed based on group decision-making theory in Iwai (2007a).

Hypothesis

> "There are differences in the effectiveness of group decision-making between Japan, China, and Russia."

In the experimental design for this paper, it was decided (due to the closed model) to assume that there is no difference of subject's capabilities between countries, because homogeneous MBA students were used as subjects in the three countries. It was also decided to observe effectiveness by measuring the open model, i.e. the satisficing of subjects. Here, the following questions were prepared as indicators for measuring effectiveness. In a questionnaire given before the game, subjects were asked whether or not they prefer group decision-making, and afterward they were asked various questions about decision-making through the course of the game. The questions asked before and after the game are indicated below. Subjects were asked to answer with a 7 point scale, with 7 points indicating maximum agreement, and 1 point indicating maximum disagreement.

BQ1. When making a decision at work, do you prefer to decide on your own or to consult with somebody else?
AQ1. Were you able to advance through the game in cooperation with other team members?
AQ2. Were you able to perform the role you were assigned?
AQ3. Were your teammates cooperative with you?
AQ4. Did your teammates perform the roles they were assigned?
AQ5. Did you have any differences of opinion with teammates in decision-making?
AQ6. Do you think that through consulting with teammates you were able to make better decisions than you would have been able to make alone?
AQ7. Were team decisions made democratically through mutual agreement?
AQ8. Did any ideas that you would not have thought of alone come up in discussions with teammates?
BQ indicates a question asked beforehand, and AQ indicates a question asked afterward.

For these questions, higher numeric values indicate higher effectiveness in group decision-making.
Each subject's higher satisfaction means higher effectiveness of group decision making.

EXPERIMENTAL DESIGN

The following experimental design was devised to experimentally verify the hypothesis.

(1) Game specifications

The business game MBABEST21 (Table 4) used in the demonstration experiment is a frame game which enables free and flexible development of games using actual business cases studies (Iwai 2007b).

Table 4 Gaming simulation specifications

Gaming Development Tool	MBABEST21
Product	Next-generation PDA
Market	Consumer market in Japan
Number of period	1 quarter × 4 periods
Input variables	Selling price, production volume, R&D expenditures, marketing expenditures, factory expansion investment, short term debt
Output reports	Income statement, Balance sheet, Cash flow statement, Team ranking report
Exogenous variables	Market growth rate, Interest, Tax rate

(2) Game scenario and course

This experiment used a market growth curve estimating the initial product life cycle of a plausible next-generation PDA at the time of the experiment, and the interest and tax rates in the Japanese market. A PDA was used because it is a comparatively homogeneous product in the various countries. It was decided to play the game with the same interest and tax rate conditions in all countries to keep those factors from affecting game results. During the course of the game, management decision-making (deciding variables such as product pricing, production volume, R&D expenditures, and marketing expenditures) is done in quarterly units, and decision-making for the next quarter is done based on financial statements and rankings of management indicators for all companies. The game progresses as this process is repeated each quarter. When managers of different departments in the same company make a decision, they do so as a group, in a competitive environment with other competing companies. Their decisions are based on the financial statements and ranking reports reported each quarter. This game was played twice by each team. The first time, it was played for two quarters as practice, and the second time, decisions were made for 4 or 5 quarters. The response variable was taken to be maximization of cumulative net profit at the end of the game.

(3) Overview of conducted experiment

Table 5 gives an overview of the experiment (Experiment Jp) conducted with MBA students in Japan (Aoyama Gakuin University), the experiment (Experiment Ru) conducted with MBA students in Russia(Moscow State University), and the experiment (Experiment Cn) conducted with MBA students in China (North Eastern University) . The number of subjects was 111 in Japan, 44 in China, and 12 in Russia . Both Japanese and Chinese students were homogeneous since these students had just started MBA program. On the other hand Russian students are the second year students in MBA and the number of Russian Students was small (n=12), those results were not used for hypothesis testing.

(4) Method of collecting variables

The response variable in this business game can be regarded as the outcome variable of decision-making in the closed model. In MBABEST21, the input/output variables of subjects are automatically recorded in the computer as the game progresses, and thus they can be used as is.

Variable values when the business game is regarded as an open model were measured by asking questions before and after the game because the values depend on the satisficing of the subject. The survey form was filled out by subjects immediately after decision-making in the two games. Evaluation was done subjectively by the subjects.

Table 5 Comparison of three experiments

	Experiment Jp	Experiment Ru	Experiment Cn
Subjects	New MBA students	MBA students	New MBA students
Number of subjects	111	12	44
Game scenario	Next-generation PDA	Same as at left	Same as at left
Required experiment time	3 hours	Same as at left	Same as at left
Number of trials	2 (Same members in 1st and 2nd trial)	Same as at left	Same as at left
Number of competing teams	25 companies	5 companies	10 companies
Students per team	4 or 5	3	4 or 5
Team selection	Recommended by others	Same as at left	Same as at left
Form of organization	Hierarchical	Same as at left	Same as at left
Experiment location	On-campus lab (Japan)	Same as at left	On-campus lab (China)
Game facilitator	1 university instructor	1 university instructor	2 university instructors

Note: For Experiment Ru, the experiment was conducted with a total of 5 teams, including 4 teams made up of Russians, 1 computer team and 1 Japanese team (with 3 members). The questionnaire was administered only to the 12 members of the Russian teams

Table 6 Basic statistics and difference testing of scores between countries

	Experiment Jp			Experiment Cn			Japan vs. China	
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	t-value	U test
BQ1	3.86	4	1.73	4.50	5	1.90	–2.00**	1.98**
AQ1	5.95	6	1.03	6.48	7	1.02	–2.91***	4.05***
AQ2	4.59	5	1.39	6.09	6	0.91	–7.86***	6.18***
AQ3	6.32	6	0.80	6.43	7	1.00	–0.76	1.30
AQ4	5.77	6	1.22	6.41	7	0.92	–3.55***	3.51***
AQ5	3.53	3	1.61	4.59	5	1.74	–3.61***	3.45***
AQ6	5.77	6	1.40	6.05	6	1.28	–1.15	1.04
AQ7	6.19	6	0.88	6.05	6	1.18	0.73	0.34
AQ8	5.89	6	1.12	5.20	6	1.56	2.66**	2.47**

Note: The t-values for Japan vs. China are obtained by testing the difference in score means between questions. However, for AQ2, AQ4, AQ7, and AQ8, the values are from Welch's t-test which does not assume equal variance. To ensure robustness, the U-test values are obtained using the Mann-Whitney U-test where the difference in medians is tested using a non-parametric method. *** indicates significance at the 1% level, and ** indicates significance at the 5% level. The number of subjects was 111 in Japan and 44 in China. However, some data was lost and the number of samples was 109 for BQ9 and 110 for AQ5 in Japan.

EXPERIMENT RESULTS AND DISCUSSION

EXPERIMENT RESULTS

This section attempts to verify the hypothesis indicated above through comparative analysis of the experiments in Japan, China.

Table 6 shows the basic statistics for the question responses, and the test statistics obtained by testing the differences in response means between Japan and China.

The experiment was also conducted in Russia, but since the number of subjects was small (n=12), those results were not used for comparison. Table 7 is described as reference data.

Table 7 Basic statistics in Russia

	Experiment Ru		
	Mean	Median	Std. Dev.
BQ1	4.42	4.5	1.98
AQ1	6.83	7	0.39
AQ2	6.25	6.5	0.87
AQ3	6.83	7	0.58
AQ4	6.58	7	0.79
AQ5	5.67	6	1.3
AQ6	6.42	7	1
AQ7	6.33	6.5	0.78
AQ8	5.67	7	1.97

Note: The number of subjects was 12.

DISCUSSION

Based on the above experimental results, this section describes the distinguishing characteristics of decision-making by the Japanese teams and Chinese teams. The differences between Japan and China are clarified by analyzing variables where there is a difference between Japan and China. Based on these analyses, a tentative model is developed to express the differences in decision-making style between Japan and China.

CHARACTERISTICS OF JAPANESE TEAMS

Areas where Japanese teams had a high mean were: team member cooperation (AQ3: 6.32) and decision-making style where decisions are made through mutual agreement (consensus) (AQ7: 6.19).

Conversely, the area where Japanese teams had a low mean was: differences of opinion with team members in decision-making (AQ5: 3.53) .

These results can be interpreted as indicating that Japanese team members cooperate well, and make decisions with an emphasis on consensus, with few differences of opinions between members.

CHARACTERISTICS OF CHINESE TEAMS

On the other hand, areas where Chinese teams had a high mean were: cooperation of the subject with other team members (AQ1: 6.48), cooperation of other team members

with the subject (AQ3: 6.43) and team members performing the roles they were assigned (AQ4: 6.41).

Conversely, the area where the Chinese teams had a low mean was the same as for the Japanese teams: differences of opinion with team members in decision-making (AQ5: 4.59).

These results can be interpreted as indicating that each subject contributes actively to team members, and team members perform their roles and cooperate with the subject. Consequently, there are few differences of opinion between team members (although the mean is higher than that of the Japanese teams) .

COMPARISON OF JAPANESE AND CHINESE TEAMS

The section above examined distinguishing characteristics of the Japanese and Chinese teams. This section examines variables where there is a major difference between Japan and China.

There were five variables where a major difference was seen between Japan and China (i.e., variables where a significant difference of at least 5% was evident when testing the difference between means).

1) Cooperation of the subject with team members (AQ1: China team 6.48 > Japan team 5.95)
2) Subject performed assigned role (AQ2: China team 6.09 > Japan team 4.59)
3) Other team members performed their assigned roles (AQ4: China team 6.41 > Japan team 5.77)
4) Differences of opinion between team members (AQ5: China team 4.59 > Japan team 3.53)
5) Emergence of new ideas (AQ8: Japan team 5.89 > China team 5.20)

Among these five variables where there is a major difference between Japanese and Chinese teams, the first interesting point is the degree to which the individual subjects and other team members performed their assigned roles. Chinese teams evaluated both individual subjects and other team members as having diligently performed their assigned roles (AQ2, AQ4). The Japanese teams did not evaluate themselves as having performed their assigned roles to the same degree as the Chinese teams. The extent to which individual subjects performed their roles was particularly low. In other words, the Japanese teams evaluated themselves as not having performed their assigned roles.

Japanese teams had fewer differences of opinion among members (AQ5) than Chinese teams. However, standard deviation was high for both sides, and there were large differences due to the country, and the specific team.

The same trend is evident for emergence of new ideas (AQ8). Japanese teams showed higher emergence of new ideas within the team, but standard deviation was not small. Standard deviation was particularly high for the Chinese teams. Here too, there were large differences due to the country, and due to the specific team. As a further analysis, Table 8 shows verification of differences in efficiency between people in the CEO and other roles in the Japanese and Chinese teams.

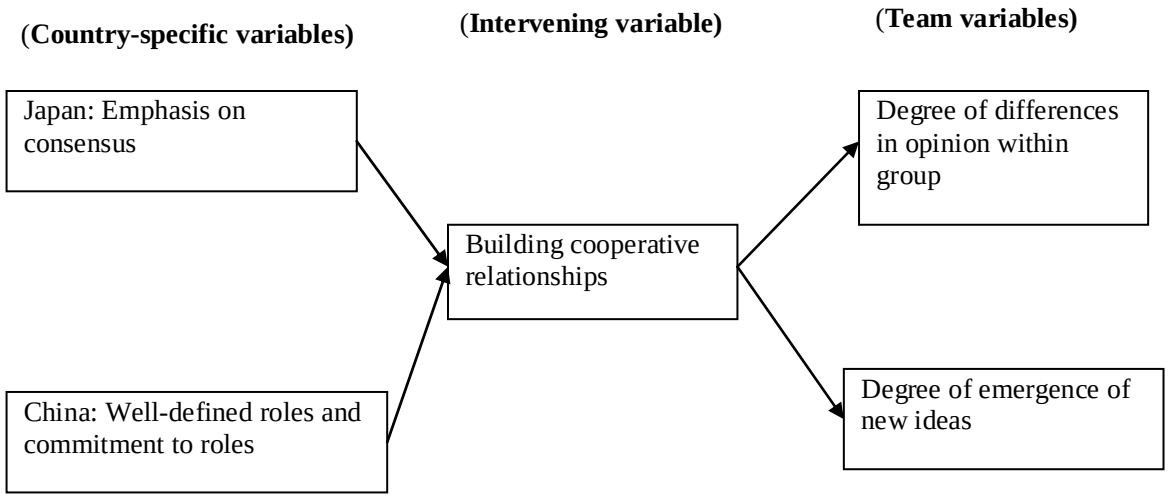
Chinese values were significantly larger for AQ2, AQ3, and AQ4. This shows that Chinese CEOs more strongly recognized their own role than Japanese CEOs. The above results suggest that China conducts more effective group decision-making than Japan. However, it was also found that Japan is superior to China in terms of emergence of new ideas.

Table 8 Difference testing of scores between CEOs and other roles

	Japan CEO			Japan Others			China CEO			China Others			Japan	China
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	CEO vs. Others	CEO vs. Others
BQ1	4.08	5	1.79	3.80	4	1.72	4.50	5	1.43	4.50	5	2.03	–0.71	0.00
AQ1	6.04	6	0.73	5.92	6	1.10	6.30	7	1.25	6.53	7	0.96	–0.64	0.62
AQ2	5.04	5	1.37	4.47	4.5	1.38	5.70	6	0.82	6.21	6	0.91	–1.84*	1.57
AQ3	6.52	7	0.59	6.26	6	0.84	6.50	6.5	0.53	6.41	7	1.10	–1.78*	–0.35
AQ4	6.16	6	0.94	5.65	6	1.27	6.30	6.5	0.82	6.44	7	0.96	–2.18**	0.42
AQ5	3.84	4	1.75	3.44	3	1.57	5.10	5	1.20	4.44	5	1.86	–1.1	–1.05
AQ6	6.00	6	1.29	5.70	6	1.43	6.40	6	0.52	5.94	6	1.41	–0.95	–1.57
AQ7	6.12	6	0.97	6.21	6	0.86	6.20	6	0.42	6.00	6	1.33	0.45	–0.76
AQ8	5.72	6	1.28	5.94	6	1.08	5.40	6	1.51	5.15	6	1.60	0.87	–0.45

Note: Japan CEO vs. Others indicates the t-values obtained by t-testing the difference in scores between CEOs and other roles on Japanese teams. China CEO vs. Others indicates the t-values obtained by t-testing the difference in scores between CEOs and other roles on Japanese teams. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates a significant difference at the 10% level.

Figure 1 Relationship of factors which determine efficiency



CONCLUSIONS AND ISSUES FOR THE FUTURE

Based on the analysis in the previous section, a hypothetical model can be presented of the relationships between the variables, as indicated in Fig. 1.

Country-specific variables are the source of differences in behavior between the Japanese and Chinese teams. Whereas Japan has vaguely-defined roles and tries to emphasis consensus, China has clearly defined roles and a strong commitment by team members to perform their respective roles. Cooperative relationships between team members are emphasized in both countries, but our hypothesis is that there are differences in the approach to cooperation. More specifically, Japan emphasizes consensus so that maintenance of relationships itself tends to become a goal. In China, cooperative relationships are built to carry out decision-making as a team, based on an underlying commitment to roles. The form of these cooperative relationships determines the degree of differences of opinion in groups, and the emergence of new ideas, but these appear as outcome variables of country-specific variables and intervening variables.

Further studies will be necessary to determine whether this hypothesis is correct, and whether other variables make a contribution, but the results of this experiment show that this is one possible model. In this paper we didn't test hypothesis about the experiments of Russia since there are issues of the heterogeneous subjects and the number of subjects. It is necessary to collect the data of Russia as future issues and to analyze it.

REFERENCES

Affisco, J., & Chanin, M. (1989). The impact of decision support systems of the effectiveness of small group decisions—An exploratory study, Developments in Business Simulation & Experiential Exercises, 16, 132–135.

Affisco, J., & Chanin, M. (1990). The impact of decision support systems of the effectiveness of small group decisions—Revisited, Developments in Business Simulation & Experiential Exercises, 17, 1–5.

Chang, J., Jennings, D., To, C., Sun, L. (2005). Strategic management: An evaluation of the use of three learning methods in China, Developments in Business Simulation & Experiential Exercises, 32, 76–81.

Chang, J., Ng, K., Moon, K., To, C. (2005). Chinese students' perceptions of business gaming, Developments in Business Simulation & Experiential Exercises, 32, 91–96.

Chang, J., Mak, W., To, C., Lau, M. (2009). The use of computer-assisted, interactive role-play simulation in China, Developments in Business Simulation & Experiential Exercises, 36, 112–118.

Chanin, M.N., & Sc

hneer, J.A. (1984). A study of the relationship between Jungian personality dimensions and conflict handling behavior, Human Relations, 37(10), 863–879.

Cohen, M.D., March, J.D., & Olsen, J.P. (1972). A garbage can model of organizational choice, Administrative Science Quarterly, 17, 1–25.

Dasgupta, S. (2003). The role of controlled and dynamic process environments in group decision making: An exploratory study, Simulation & Gaming, 34, 54–68.

Deep, S.D., Bass, B., & Vaughan, J.A. (1967). Some effects of business gaming of previous quasi-T group

afflictions, Journal of Applied Psychology, 51(5), 426–431.
Estes, C.A. & Smith, J.R. (1979). Research on the effectiveness of using a computerized simulation in the basic management course. In S.C. Certo & D.C. Brenenstuhl (Eds.), Insights into experiential pedagogy (pp.25–28), Tempe: Arizona State University.
Faria, A.J., Dickinson, J. R., Peterson, R. (1996). Administering business simulations in transitioning economies: The introduction of simulation gaming to Estonia, Developments in Business Simulation & Experiential Exercises, 23, 15–21.
Halterman, C., Sampson, N. (1995). Some outcomes of experiential learning: How the cultural dynamics of different countries are reflected in workplace norms & values, Developments in Business Simulation & Experiential Exercises, 22, 242–245.
Hornaday, R. (1999). Multi-cultural experiential learning: A computer simulation in China, Developments in Business Simulation & Experiential Exercises, 26, 338–339.
Ichikawa, A. (1993). The decision making environment for business gaming in information society, Studies in Simulation and Gaming JASAG, 3(1), 1–10.
Iwai, C. (2007a). An experiment of improvement of group decision making in organization by business game, Studies in Simulation and Gaming JASAG, 17(2), 101–108.
Iwai, C. (2007b). Development of MBABEST21, A case-based management game. International Conference on Internet-Business (ibiz2007), 291–300.
Iwai, C. (2009). Group decision experiments using business game—Problem solving with conflict, Developments in Business Simulation & Experiential Exercises, 36, 165–170.
Keys, B., Burns, O.M., Case, T., & Wells, R.A. (1988). Decision support package in a business game: Performance and attitudinal effects, Simulation & Gaming, 19(4), 440–452.
Kurosawa, T. (1990). A survey of gaming simulation for management education in 40 industrial engineering department, Studies in Simulation and Gaming JASAG, 1(1), 89–93.
Lamont, D. L., Volkov, A. E., Shoptenko, V. V. International management game—an integrated tool for teaching strategic management internationally, Developments in Business Simulation & Experiential Exercises, 32, 175–182.
March, J.G., & Simon, H.A. (1958). Organizations, Wiley.
McKenny, J.L., & Dill, W.R. (1966). Influences on learning in simulation game, American Behavioral Scientist, 10(2), 28–32.
Miesing, P. (1982). Group processes, decision making styles and team performance in a complex simulation game, In D.J. Fritzche & L.A. Graf (Eds.) Development in business simulation and experienced exercises (pp. 228–231). Normal: Illinois State University
Norris, D.R., & Niebuhr, R.E. (1980). Group variables and gaming success, Simulation & Games, 11(3), 301–312.
O'Reilly, C. (1982). Variations in decision maker's use of information sources: The impact of quality and accessibility of information, Academy of Management Journal, 25(4), 756–771.
Rybalsky, V., Wolfe, J. (1999). Management gaming's lost opportunity: Meditations about the Russian experience and prospects for the future, Developments in Business Simulation & Experiential Exercises, 17, 132–137.
Schroeder, R.G., & Benbassat, I. (1975). An experimental evaluation of the relationship of uncertainty in the environment to information used by decision makers, Decision Sciences, 6, 556–567.
Shirai, H. (1996). Gaming simulation for problem setting, Studies in Simulation and Gaming JASAG, 6(1), 85–92.
Simon, H.A. (1976). Administrative Behavior (3rd ed.), Macmillan Publishing.
Simon, H.A. (1996). The science of the artificial (3rd ed.), MIT press.
Vance, S.C., & Gray, C.F. (1967). Use of a performance evaluation model for research in business gaming, Academy of Management Journal, 10(1), 27–37.
Volkov, A. A., Klimov, A. A., Tugaev, M. J., Lysova, S. I., Shoptenko, V. V. (2004). Teaching public finance management through simulation, Developments in Business Simulation & Experiential Exercises, 31, 221–228.
Wolfe J. (1991). On the transfer of market oriented business games to socialist cultures, Developments in Business Simulation & Experiential Exercises, 18, 121–126.
Wolfe J., & Box, T.M. (1988). Team Cohesion Effects on Business Game Performance, Simulation & Gaming, 19(1), 82-98.
Wolfe J., Bowen, D.D., & Roberts, C.R. (1989). Team building study, Simulation & Gaming, 20(4), 388–408.
Wolfe J., & Chacko, T.I. (1983). Team-size effects on business game performance and decision making behaviors, Decision Sciences, 14, 121–133