

子どもの発達に応じた創造的ディスカッション技能 を育む学習／教育環境作り

丸野, 俊一
九州大学大学院人間環境学研究院

<https://hdl.handle.net/2324/13254>

出版情報 : 2008-03
バージョン :
権利関係 :

The effect of debate training on argumentative skills: The developmental process of Japanese college students

Nakano Mika & Maruno Shun'ichi
Kyushu University, JAPAN

How do students acquire argumentative skills by debating? Although this question has long been attempted to answer in various ways, a common limitation of the previous studies is the tendency to ignore the potentials of college students who learn how to argue for the first time in a community of practice. This paper aims at proposing a process model of acquiring argumentative skills which was brought out by short-term experiment using a "Parliamentary Debate" format conducted for Japanese college students. The main points of the findings were: (1) all participants improved their argumentative skills, (2) a developmental process of reasoning was found, and (3) the most difficult stage for Japanese learners was revealed. For pedagogical implication, to teach reasoning and persuasion to those who are especially unwilling to oppose someone, we need to have them realize their improvement with confidence, reducing their mental blocks. By discussing their developmental stages of argumentative patterns, the future prospects of argumentative education for Japanese students and research method on interaction will be further explored.

Keyword: argument, reasoning, debate, community of practice, developmental process

When we argue with others, higher order thinking and reasoning are most involved among various thinking styles in our lives. Previous studies have paid attention to the effect of social influences toward the development of reasoning, which is often traced back to Vygotsky (1981). Most of them regard argumentation as a device for promoting deep and elaborative learning (Anderson et al., 2001; Barron, 1991; Bell & Linn, 2000). Kuhn (1991) describes "thinking as argument", and examined the extent to which a process of reasoned argument underlies the beliefs people hold and the opinions they espouse. Her results indicated that argumentative reasoning ability does not differ systematically as a function of sex or age, but is strongly related to educational level. This supports social contexts has a significant impact on developing argumentative thinking skills.

Obviously the educational level is one of

the most explicit factors to explain the differences of thinking styles with which the learners are surrounded. Better education may explain the difference as a whole. However there are distinguished differences in argumentative skills even among students who have the same educational background. Means & Voss (1996) found that argumentation skills did not increase with school grade, suggesting that schooling does not significantly affect the development of this aspect of informal reasoning. One of the main reasons for this is that knowledge distributed to students varies greatly according to teachers who they learn from. In science education, Newton, Driver, & Osborne (1999) reported teachers do not give students opportunities to refine their argumentation skills, since they dominate classroom discourse leaving very little room for whole-class discussion and students'

engagement in the construction of arguments. Until now, some researches shows change before and after engaging in an argumentative discourse intervention in empirical settings. On the other hand, little empirical evidence has been available regarding how argumentative skills develop or do not develop, despite their considerable educational, as well as theoretical significance. These questions of what gets internalized or appropriated and under what circumstances still remain unanswered.

Cultural difference is also an important matter in argumentation studies, as individuals and a community co-construct quality of arguments. The previous study has revealed that the need for cognition and assertiveness predicts a disposition to engage in argument, while a desire to maintain warm relationships as well as assertiveness predicts argument avoidance (Duschl & Osborne, 2002). It has also been found that individuals differ in their preparedness to learn from argumentation. In Japanese education, argument is rarely taught in classes. This is partly because the main stream of Japanese education has long been centered on individual memory, not interaction among students and teachers (Maruno, 2001). Education has deprived students of chances to learn how to argue, unless they access to special environment surrounded by people who like to do so. One of the author pointed out that Japanese students tend to hesitate to argue with friends: low in approach argumentativeness and high in avoidance argumentativeness compared to other Asian countries (Nakano, 2007). This atmosphere makes classroom discussion difficult for not only students but also teachers. Recently, the number of the schools which introduce discussion program into classes is rapidly increasing from elementary to higher educational levels. Despite this trend, however, empirical studies about argument education are

scarce and its effect has not been sufficiently tested yet.

Among various kinds of discussion, we believe that the format of debate is best suitable for inexpedient college students in the early stage. There are two reasons for this. The first reason is to experience the basics of argument. As debate is designed to develop arguments by constructing one's own argument, refuting others' and summarizing the whole arguments separately, participants smoothly learn what they should do during participation. The second reason is to refute someone without conflict that arises in relationships. It is not always simple to distinguish between people who argue and the content which is argued. In these senses, debate provides a section assigned to each purpose, which facilitates arguing in the order that suits appropriate goals.

Of all educational debate, Parliamentary Debate (PD) has the most world-wide popularity and strong orientation towards persuasiveness (Inoue & Nakano, 2006). Its unique characteristic can be summarized as follows: (1) speeches are targeted to ordinary average-knowledgeable persons, not experts, (2) rhetorical persuasiveness is valued as well as logical proof in a speech, (3) all kinds of issues of daily life are used for resolutions that change every round, (4) extemporaneous response is required because the standing sides and the resolution are announced only 20 minutes before the round begins. Every stage of debate activity such as preparation, round, reflection and so on forms a set of cyclic learning system, and this functions as an ideal community of practice which intensify the effectiveness of its teaching method (Lave & Wenger, 1991).

To see interaction between cultural and individual changes in argumentative settings, here applies the conceptualization provided by Greeno & van de Sande (2007). They regard

information structures as the concepts of distributed knowing and interaction in activity systems. From this view point, conceptual understanding about argument and persuading are considered as achievement of discourse in activity system. To analyze the development of arguments, we believe natural situation for people persuading, reasoning and arguing through activities in a community is essential. Thus, a community in which members participate and acquire necessary knowledge needs to be targeted. At the same time, what the members acquire through participation should be connected with that.

Considering these background, the present study aims at exploring how members of a community acquire argumentative skills through debating. To do so, we first identify a pattern that argument produced changes during the session. Second, we analyze transitional pattern, focusing individual differences. Participants who belong to a debating community repeated about thirty-minute debate training during one-month session. The speech data before and after the training are patterned and evaluated according to coding categories.

We set four basic components for analytic schema: claim, reason, data and structuration. These are shared among three integrant parts of argument: to claim one's opinion, to refute other's idea, and to summarize the opinions. The first three are frequently used, partly supporting Toulmin's framework (Toulmin, 2003). In the present study, we add the forth

category, structuration. Contrast to the former three elements, it is related to the overall organization of an argument. There are three main points of structuration. First is how the three categories are ordered, connecting each element, not just mentioning them as disjointed. Secondly how logical organization, especially causal inference in an argument is valid. Thirdly, how the above two efforts are appropriately expressed with words which make audience understood. We expected that the perspective of structuration provides important analytic perspective for developing a certain argumentative pattern, as this first occurs in association with persuading others, not individual alone. By analyzing above points, we examine the process of argumentative change at the individual level as well as the community level.

METHOD

Participants

Participants were 20 freshmen of a Japanese college students ($M=6$, $F=14$). To investigate the first stage of developmental process, students who had not experienced special debate training before were selected. The average age was 19.7 ($SD=5.8$). They belonged to a club studying for English which has turned out a number of national-level students in the competition of debate, discussion, interpretation and so on. With collaboration from the club members, the activities which

TABLE1
Summary of Activity and Cognitive Goal

Activity	Goal	Function
1. Debate Rule	Basic knowledge about debating & format	<i>Constructing argument structure</i>
2. Argumentation	Basic knowledge about argument construction & reasoning	
3. Info gathering	Method of data collection & arrangement	
4. Manner	Method of delivery & attitude for presentation	<i>Window of reflection</i>

originally integrated were coordinated in accordance with the aim of this study.

Data

1) *Individual assessment of arguments.* They participated in several questionnaires and interviews for individual data, conversation style in daily life, informational argumentativeness. The present study analyzed two-minute speeches with two-minute preparation time on the pretest and posttest. Participants were instructed to make a persuasive presentation about two themes: capital punishment and smoking. For analysis, forty cases in total were used. The questions were “do you support capital punishment” “do you support smoking”. The speeches were recorded on IC recorder by one of the authors.

There are two reasons to adopt two-minute speech to analyze argument produced. First, two minutes is enough to construct four basic components: claim, reason, data and structuration, and develop basic argument about one theme. The second reason is that for novice participants, long speech can cause excessive psychological strain. From experience point of view in observation, it is concluded that two minutes is appropriate to state their opinion.

2) *Assessment of argumentative discourse.* For analyzing social factors, debate matches during the sessions were recorded. The refutation conducted in the round helped to know what kind of viewpoints was acquired. The details of the session and debate format are as follows.

Session

Participants took part in a series of about eighty-hour debate training, over a period of four weeks from June 2005, five days a week, at lunch time (forty-five minutes) and evening (three hours). This training is one of the events

held in the club annually which has a tradition of about forty years. After the one-month practices, an inner debate tournament was held as a goal. During the session, no teacher or coach gave them advice; participants only learned from the other members who had experienced the same training before, although some of them had a top-level ability among college debaters.

Table 1 shows the summary of activity participants experienced through the session. On the first day of the training, they participated an explanatory meeting for primary basic knowledge about debating and format (1. Debate rule). After the second day, they started practicing debate. During debate training, they learned Basic knowledge about argument construction and reasoning (2. Argumentation). At the same time they learned the method of data collection and arrangement (3. Info gathering), and the method of delivery and attitude for presentation (4. Manner).

Those four outputs seemed to function differently. The three categories of (1) debate rule, (2) argumentation, and (3) info gathering were essential for constructing arguments which is the core of reasoning. On the other hand, (4) manner can be regard as a window of reflection, which facilitate learning contents of arguments. Although these are not easy to examine how they contributed them to cultivate argumentative skills, we believe the four categories are the basis for debate program.

Debate format

The format of debating used is PD style. The standing points are two sides: affirmative and negative. Each side consisted of four speeches. The first speeches were for constructing own argument. The second and third speeches were allocated to support own arguments and to refute the others'. In the forth

speech, the speakers summarized the whole arguments, comparing the both sides.

The allotted time of each speech was four minutes, and one practice match took thirty-two minutes. On average, one participant took part in twenty debating matches during the session. Participants were encouraged to manage their time well so that they could persuade audience better. In addition, both side had ten-minute preparation time. As well as individual thinking, collaboration in a group was requisite to integrate all arguments. The rest of the members except to the eight debaters evaluated and judged the match, marking individual and group scores. After debating finished, they gave feedback each other for about an hour.

RESULT AND DISCUSSION

In this section, we first analyze argument patterns produced by participants. Then, we examine how the arguments developed and look into the quality of arguments.

1. Changes of Argument Pattern

To analyze the arguments produced, we set an original framework suitable for this data. The participants are instructed by members of the community for the purpose of persuading audience. Even though they were novice of debating before session, some of them reached a standard of those who participate a national debate tournament after the session. To cover the wide range of performances, we divided argumentative patterns into several subordinate elements according to the four basic components: claim, reason, data and structuration. The first author and an independent judge scored thirty percent of all written transcriptions. Inter-rater reliability as indicated by percentage was 96%. Disagreement was resolved in conference by discussion in the presence of the first author. By coding the speech data on the pretest and posttest, nine patterns are found. Further analysis specifies three upper patterns which are qualitatively different (cf. Nakano, 2007).

Table 2
Number of Argument Pattern

Upper Model	Subordinate Model	Component of Reasoning ^a	N ^b	
			Pretest	Posttest
			7 (17.5%)	24 (60%)
A. Elementary Model	A1. Logically Organized Model	C + R + D + S ¹	1 (2.5%)	11 (27.5%)
	A2. Logically Expanded Model	C + R + D + S ²	0 (0%)	5 (12.5%)
	A3. Fair Model	C + R + D + S ³	6 (15%)	8 (20%)
			11 (27.5%)	12 (30%)
B. Incompletion Model	B4. Narrow-Reasoning Model	C + R + D ¹	1 (2.5%)	5 (12.5%)
	B5. Limited-Reasoning Model	C + R + D ²	6 (15%)	5 (12.5%)
	B6. Poor-Reasoning Model	C + R + D ³	4 (10%)	2 (5%)
			22 (55%)	4 (10%)
C. Deficiency Model	C7. Aimless Model	C + R	5 (12.5%)	2 (5%)
	C8. Reasonless Model	C	13 (32.5%)	2 (5%)
	C9. Chat Model	NA	4 (10%)	0 (0%)

^aC: claim, R: reason, D: data, S: degree of structuration, ^bN=40 cases

The result of pattern change is indicated in Table 2. The upper models are: (A) Elementary Model, (B) Incompletion Model, and (C) Deficiency Model. (A) Elementary Model has four basic components: CRDS, while (B) Incompletion Model lacks S and (C) Deficiency Model lacks DS. When the arguments obtained data to support claim, it rises to (B) Incompletion Model from (C) Deficiency Model. When the arguments get organized ordering information progress to the (A) Elementary Model from (B) Incompletion Model.

These upper models are further divided into nine patterns, according the presence or absence of claim and reason. (A) Elementary Model has below (A1) Logically Organized Model, (A2) Logically Expanded Model, (A3) Fair Model, according the degree of structuration. (B) Incompletion Model has (B4) Narrow-Reasoning Model, (B5) Limited-Reasoning Model, (B6) Poor-Reasoning Model, according the quality of data. (C) Deficiency Model has (C7) Aimless Model, (C8) Reasonless Model, (C9) Chat Model. The differences of degrees in one upper model were indicated as ordering 1, 2, and 3. The result is shown in Table 2.

At the beginning, we compare the number of arguments coded by upper model: (A) Elementary Model, (B) Incompletion Model, and (C) Deficiency Model. As expected, on pretest, the number of (A) Elementary Model was the lowest, 7 (17.5%), and (B) Incompletion Model in the middle, 11 (27.5%), (C) Deficiency Model in the highest, 22 (55%). On the other hand, the result of posttest was reverse order. The number of (A) Elementary Model was the highest, 24 (60%), and (B) Incompletion Model in the middle, 12 (30%), (C) Deficiency Model in the highest, 4 (10%). This result indicated that intensive debate

training helped participants organize their opinions effectively. As a whole, participants' performances were improved, but not all of them upgraded. For further analysis, three patterning is not efficient to explore differences

To analyze arguments more in detail, three models were divided into nine models according to the subordinate skills. Each has three subordinate cases: (A) Elementary Model; (A1) Logically Organized Model, (A2) Logically Expanded Model, and (A3) Fair Model. (B) Incompletion Model: (B4) Narrow-Reasoning Model, (B5) Limited-Reasoning Model, and (B6) Poor-Reasoning Model. (C) Deficiency Model: (C7) Aimless Model, (C8) Reasonless Model, and (C9) Chat Model.

The results in Table 2 shows that the comparison of three and nine patterning. On pretest, three Elementary Models were: A1, 1 (2.5%); A2, 0 (0%); A3, 6 (15%). Three of Incompletion model were: B4, 1 (2.5%); B5, 6 (15%); B6, 4 (10%). Three of Deficiency model

Table 3
Transition Pattern of Argument

pretest	posttest	N
A1	→ A1	1 (100%)
A3	→ A1/A3	6 (100%)
B4	→ A2	1 (100%)
B5	↘ A1 ↘ B4/B5	2 (33%) 4 (67%)
B6	↘ A3 ↘ B4/B6	2 (50%) 2 (50%)
C7	↘ A2/A3 ↘ C7	2 (40%) 3 (60%)
C8	↘ A1/A2/A3 ↘ B4/B5/B6 ↘ C8	8 (62%) 4 (31%) 1 (8%)
C9	↘ A1/A3 ↘ B4/B5	2 (50%) 2 (50%)

N=40 cases

were: C7, 5 (12.5%); C8, 13 (32.5%); C9, 4 (10%). On posttest, the numbers changed as follows: Elementary Models were: A1, 11 (27.5%); A2, 5 (12.5%); A3, 8 (20%). Three of Incompletion model were: B4, 1 (2.5%); B5, 5 (12.5%) B6, 5 (12.5%). Three of Deficiency model were: C7, 2 (5%); C8, 2 (5%); C9, 0 (0%).

Focusing the highest and the lowest categories, A1 and C9, the distributions were clearly changed. Before training session, only one case categorized as A1. Logically Organized Model, while C9. Chat Model had four cases. After the session, eleven cases regarded as A1, and none of them was C9. On the other hand, it is difficult to confirm the direction of improvement from the number of cases in the middle level, Incompletion Model. Nine patterning helped to clarify the overall tendency: some models improved and others didn't, which implicate individual development of arguments produced.

2. *Developmental Stage of Argument*

Next, using the results of pattern change in the section 1, we specify individual differences. Table 3 shows the pattern of transitional change, indicating with up to three arrows according to the primary categories: (A) Elementary Model, (B) Incompletion Model and (C) Deficiency Model. Although transition pattern is not ultimate conclusion because of the limited number of cases in the present study, the transition pattern obtained was as follows.

In case of (A) Elementary Model, the number of transition from A1 to A1 was 1 (100%), from A3 to A1/ A3 was 6 (100%). As for (B) Incompletion Model, from B4 to A2 was 1 (100%), from B5 to A1 was 2 (33%), from B5 to B4/B5 was 4 (67%), from B6 to A3 was 2 (50%), from B6 to B4/B6 was 2 (50%). Lastly, (C) Deficiency Model was: from C7 to A2/A3

was 2 (40%), from C7 to C7 was 3 (60%), from C8 to A1/A2/A3 was 8 (62%), from C8 to B4/B5/B6 was 4 (31%), from C8 to C8 was 1 (8%), from C9 to A1/A3 was 2 (50%), from C9 to B4/B5 was 2 (50%).

Here we analyze some regularities of pattern transition. All the cases categorized as (A) Elementary Model on pretest remained without change on posttest. The B4 case of (B) Incompletion Model was improved to A level. However, the B5 and B6 of (B) Incompletion Model, and C7 of (C) Deficiency Model did not develop and kept the same stage, accounting for more than half: from B5 to B4/B5 (67%), from B6 to B4/B6 (50%), from C7 to C7 (60%) (See the underlined parts in Table 4). On the other hand, most of the C8 and C9 cases progressed, which indicated that the participants categorized into the low level easily shifted to better level after training compared to the higher categories.

Then, why did B5, B6 and C7 were difficult to make transition to the higher level? Reasoning skills provides a source of perspective on argument transition. To examine the reasoning skills of each pattern, we analyzed components obtained by extraction with nine patterns. The lowest level, C9, did not have any reasoning components. In the next level, C8, claim is stated, and Reasons are added to C7. B6 has data to support claim, but it is incomplete. B5 also has inconsistent data. There are more reasonable data in B4 and A3. Finally A2 and A1 are organized with more detailed explanation.

Looking at the reasoning components of B5, B6 and C7, which were difficult to improve, all of them have a problem with the part of data. Although data is essential to construct argument, it is expected that freshmen know what data is and how to use it. Participants of this study hadn't taken any special debate training before, but there are great differences between

individuals about discussion tendency in daily life. Sometimes it is neither easy to know one's own communication pattern, nor to notice problems and solutions. Without experiencing debate, there are participants who knew about data and who did not know. Even the latter could acquire skills about reasoning by evaluating others and being evaluated for four weeks. However, the result indicated that it is not straightforward for novice students to comprehend reasoning by repeating debating, highly depending on situated cognition.

This result indicates that the categories of argument shown above corresponds with the zone where participants are surrounded as learning environment. It is implicated that (B) Incompletion Model, the level of testing data is a difficult point in this study as what data is legitimate is socially constructed. This can be interpreted as collaborative process. On the other hand, at (A) Elementary Model and (C) Deficiency Model, there was not obstacle line which disturbed transition. These two models can be regarded intrapersonal zone. From this result, we can find that participants moved intrapersonal zone to collaborative zone to develop argumentative skills in a community. This supports Maruno's three directional Zigzag movements which described the interactional directions between individuals and society when students learn in discussion (Maruno, 2001, 2002).

For pedagogical implication, to teach debate to students who are especially unwilling to argue, we need to have them realize their improvement with confidence, for example, giving an appropriate task for each learner's developmental level. By reducing the mental block, it is then easier and more effective to teach a higher level of argumentative skill.

3. Quality of arguments for persuasion

Taking a closer look at the quality of arguments, we found four steps for qualitative component for persuasion. Table 4 shows qualitative components for persuasion. The first step is to understand the diversity of value and widen one's sphere of knowledge (Level 1). Next is to frame one's own idea (Level 2). The third step is to frame one's own idea, putting other's thoughts and information together (Level 3). The last step is to frame one's own idea, arranging for predictable refutation (Level 4). In other words, the process of acquiring argumentative skills is the process of acquiring other's viewpoint as refutation. By debating, constructing, refuting, and summarizing, and evaluating arguments, all the participants reached Level 4 after the four-week training. In this section, we analyzed the change of reasoning, focusing on the level 4, accounting for three phenomena: reasonability, sociality, relevancy and multi-directionality. Reasonability is about the degree of persuasiveness, especially the connection between claim and reason. Sociality is about the scope of the reason targets. Table 5 shows the number of arguments linked Level 4: Sociality was 13 cases; reasonability 21, Multi-directionality 6, out of 40 cases.

Table 4
Qualitative components for persuasion

Level 1	To understand the <i>diversity of value</i> and widen one's sphere of knowledge
Level 2	To frame <i>one's own</i> idea
Level 3	To frame one's own idea, <i>putting other's thoughts and information together</i>
Level 4	To frame one's own idea, <i>arranging for predictable refutation</i>

Case 1 is about reasonability. The speaker gave a reason “capital punishment isn’t used in Australia” to state opinions about capital punishment in Japan. It is easy to question “why Australia?” or “how that can be the reason for stating the claim?” In addition, the claim itself is unclear: stating “I agree” but “I can’t say that clearly”. In this case, the speaker’s opinion unresolved so that the reasoning is also unclear. On the other hand, after the session, the argument drastically changed. The supported reasons increased and became more reasonable: deterrence power and feelings of victim’s family, which can be accepted by majority of people. The degree of conviction also changed significantly. Before the session, the claim was somewhat undecided, but the speaker said “I totally agree” on the post test. By listening to others’ opinion and being refuted by others, the she was convinced for supporting capital punishment, rejecting the reason given on the pretest. This can be assumed that she made a judgment about the reasonability of her argument, as a result of comparing two reasons: Australian issue is less persuasive and deterrence power and feelings of victim’s family were enough reasons to persuade herself.

CASE 1 : Reasonability

Pretest

I agree with capital punishment, but I can't say that clearly. Because capital punishment isn't used in Australia.

Posttest

I totally agree with capital punishment. I have two reasons. The first one is about its deterrence power, and the second one is about feelings of victim's family.

Accepted refutation:

—Why Australia?

—How the Australian case can be the reason for stating the claim?

Case 2 is about sociality. Sociality is the increase of scope which involves with social factor, not merely individual reason. The speaker raised a reason that she really hated smoking for opposing smoking. The statement “smoking is just nothing but poison” sounded somewhat emotional not reasonable. In this case, her perspective is limited to her own emotion or feeling, and rejecting any other view wider than that. On the other hand, on the posttest, her reasoning changed dramatically. She gave different reasons saying “The first reason is “unhealthy”. The second one is “waste of money”, which she never mentioned on the pretest before. These reasons are easy to be accepted by more audience because they are the shared interests for most of the people. On the contrary, the reason “I really hate smoking” less accepted by listeners because the subject is “I” and individual impression or idea cannot be the reason for others to judge something especially in this smoking case.

Table 5

Number of Arguments linked Level 4

reasonability	sociality	Multi-directionality
21 (52.5%)	13 (32.5%)	6 (15%)
N=40 cases		

CASE 2 : Sociality

Pretest

I don't support smoking. I really hate smoking. Smoking is just nothing but poison.

Posttest

I strongly disagree with smoking with two reasons. The first reason is “unhealthy”. The

second one is "waste of money".

Accepted refutation:

- *Your feeling is not relevant to others judgment.*
- *You cannot decide everything is poison. Think about other possibilities.*

Case 3 is about Multi-directionality. Multi-directionality is how a claim is tested from various points of views. Case 3 shows a good example. On the pretest, the speaker stated that he definitely opposed smoking with the reason that smoking has no merit. This statement is one-sidedly decisive, and there is no place for doubting this idea. In comparison with this, on the posttest he changed his opinion neutral: "I can't decide whether smoking is bad or not". It is quite different from the previous one. He continued that smoking is bad from his own stand point, but it may be important for other people. This is how he changed the perspective toward a problem. We can infer from this that he learned that there are other view points, and they should be considered in judging something. He also adds an analysis about how smoking is important for them imaging the side effect: "as the refrain way cause stress which may lead to other diseases". Case 3 seems similar to case 2, Sociality. However directions of development are dissimilar. In case of sociality, the claim was unchanged, but the supporting reasons changed to more social ones. Reasons which are more likely to be accepted were selected. In comparison with sociality, multi-directionality includes the change of claim. From one side of view, one claim can be easily concluded. However, considering other possibilities, conclusion is difficult to insist. More perspectives are concerned, more difficult the statement is judge.

CASE 3 : Multi-directionality

Pretest

I definitely oppose smoking. Because smoking has no merit.

Posttest

I can't decide whether smoking is bad or not. I think smoking is just a bad thing. But it may be important for people who want to smoke to do so, as the refrain way cause stress which may lead to other diseases.

Accepted refutation:

- *Your feeling is not relevant to others judgment.*
- *You cannot decide everything is no merit. Think about other possibilities.*

SUMMARY AND CONCLUSIONS

The present study aimed at exploring how members of a community acquire argumentative skills through debating. We first identified a pattern that argument produced changes before and after the training. Second, we analyzed transitional pattern, focusing individual differences. Third, qualitative components for persuasion were explored.

From the series of analyses, we confirmed that debate training expands the capacity of reasoning strategy and all participants improved their skills as a result. The developmental process of reasoning was also found. Prediction of refutation is the key for the most persuasive argument. These results contribute to explore the developing cognitive competence of individuals with social scaffolding in a community of practice. In addition, the process model can be utilized to design educational program. Future researches are expected such as to examine the process by longer and more

specific experiment. Cultural differences are also main interest in the socio-cultural matter.

References

- Anderson, R., Nguyen-Jahiel, K., McNurlen, B., Archodidou, A., Kim, S., & Reznitskaya, A., et al. (2001). The snowball phenomenon: Spread of ways of talking and ways of thinking across groups of children. *Cognition and instruction*, 19, 1-46.
- Barron, J. (1991). Beliefs about thinking about abortion. In J. F. Voss, D. N. Perkins, & J. W. Segal (Eds.), *Informal reasoning and education* (pp. 169-186). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bell, P., & Linn, M. (2000). Scientific arguments as learning artifacts: designing for learning on the Web in KIE. *International Journal of Science Education*, 22, 797-817.
- Duschl, R., & Osborne, J. (2002). Supporting and promoting argumentation discourse in science education. *Studies in Science Education*, 38, 39-72.
- Greeno, J. G., & van de Sande, C. (2007). Perspectival understanding of conceptions and conceptual growth in interaction. *Educational Psychologist*, 42(1), 9-23.
- Inoue, N., & Nakano, M. (2006). The costs and benefits of participating in competitive debate activities: Differences between Japanese and American college students. In F. H. van Eemeren, M. D. Hazen, P. Houtlosser & D. C. Williams (Eds.), *Contemporary Perspectives on Argumentation: Views from the Venice Argumentation Conference* (pp.167-184). Amsterdam: Sic Sat.
- Kuhn, D. (1991). *The skills of argument*. NY: Cambridge University Press.
- Lave, J. & Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation* (Learning in Doing: Social, Cognitive and Computational Perspectives). London: Cambridge University Press.
- Maruno, S., Ikuta, J., & Hori, K. (2001). How do discussion goals determine the pattern of discussion. *Kyushu University Psychological Research*, 2, 11-33. (in Japanese)
- Maruno, S., Hori, K., & Ikuta, J. (2002). An analysis of the functions of metacognitive speeches and strategies for scientific reasoning and verification in the collaborative discussion process. *Kyushu University Psychological Research*, 3, 1-19. (in Japanese)
- Means, M. L., & Voss, J. F. (1996). Who reason well? Two studies of informal reasoning among children of different grade, ability, and knowledge levels. *Cognition and instruction*, 14, 139-178.
- Nakano, M. & Maruno, S. (2007). *The effect of debate training on argumentative skills: The developmental process of Japanese College students*. Paper presented at 12th Biennial Conference for Research on Learning and Instruction. Eötvös Loránd University, Budapest, Hungary. (Aug 18-Sep 1)
- Nakano, M. (2007). How college students acquire argumentative skills in a community of practice. *Cognitive Studies*, 14(3), 398-408. (in Japanese)
- Newton, P., Driver, R., & Osborne, J. (1999). The place of argument in the pedagogy of school science. *International Journal of Science Education*, 21, 553-576.
- Toulmin, S. E. (2003). *The Uses of Argument* (2nd ed.) Cambridge University Press.
- Vygotsky, L. (1981). The genesis of higher mental functions. In J. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 144-188). Armonk, NY: Sharpe.

