Abstract

This study examines how an individual's argumentative communication traits and involvement, a situational factor, account for the way the individual structures his or her written argument. Research questions were posited to ask which of the three models—the Interaction Model, the Mediation Model, and the Simple Main Effects Model—best predicts the use of macro- and micro-structures of written argument. Logistic and multiple regression analyses were conducted to analyze 229 usable responses collected from Japanese college students. The results revealed that the Mediation Model and the Simple Main Effects Model are viable models. Argumentative traits and involvement interrelate to explain argument structures, revealing a somewhat complex but interpretable mechanism.

Keywords: argument structures, argumentativeness, involvement

Trait and State Approaches to Explaining Argument Structures[1]

Individuals form and express their opinions about reality. This process is called argumentation, and its product argument. Argument is a ubiquitous phenomenon in our daily lives because we need to articulate our opinions in many contexts of our lives. Because of its ubiquitous nature, argument has been the focus of researchers' attention. Developed early with the study of formal logic, the study of argument diverged in different directions in the latter half of the 20th century (Hample, 1990; Zarefsky, 1990). One of such directions involved examining arguments that ordinary people pursue in everyday life. These arguments can take different forms such as written, spoken, or visual.

The present study focuses on individuals' written arguments, or written expressions of their opinions on a controversial issue. Some may argue that written arguments are formed privately and they are different in nature from public or interpersonal arguments. However, it is reasonable to expect that an individual who constructs an interpersonal argument well, for example, is equally capable of constructing a private argument. That is because an argument, regardless of the context where it takes place, is likely to be a result of an individual's thought process. Billig (1996, p. 141) argues that "we can expect private thinking to be modeled on public argument" contending that human thinking has basically an argumentative character. In this perspective, individuals' private expression of opinions in the absence of any specific audience is

considered to closely approximate the public expression of their opinions (Wegman, 1994). Thus, the study of written argument should have implications for the study of other forms of argument in various contexts.

One of the important issues in the study of argument is to find out why people argue the way they do. To deal with the issue, we need to find factors that explain the mechanism. Therefore, the goal of this study is to examine how an individual's communication traits and factors in a given communication situation account for the way the individual structures his or her argument. In the study of written arguments, there has been little research conducted on this topic because past researchers focused most of their attention on the influence of such factors as age (Scardamalia & Paris, 1985), expertise (Crammond, 1998), targeted audience (Hays & Brandt, 1992), and culture (Kobayashi, 1984) on argument strategies or qualities. Given the paucity of research on this topic, it is valuable to pursue the goal.

The topic for the present study is framed as a part of the issue of argumentative communication, which involves debates on whether traits, situational factors, or interaction between the two best explain argumentative communication behavior (see review by Rancer & Avtgis, 2006). In accomplishing the goal, this study presents a way of assessing structures of written argument. This study is valuable in the following respects. First, this study will explore the best explanatory model for argumentative communication

behavior, contributing to the theoretical development of argumentative communication. Second, it has a pedagogical value; this study will give us insight into specifically what we should do to help learners construct argument in desired manners. Finally, this study will demonstrate whether the method of describing arguments used in this study is useful and valid. It is important because past research on argumentative communication did not employ a method of evaluating the specific quality of argument in an empirical manner, thus has not examined the relationship between the proposed predictors of argumentative communication and specific qualities of argument, particularly argument structures.

In the following sections, I will review literature on the effects of trait and situational factors on argumentative communication to frame the issue raised in the present study. I will also provide the definition of argument used in this study, and briefly illustrate how argument structures are to be described in this study. I will posit research questions and explain the three models of explaining argument structures before I go on to the description of the method, results, and discussion for the present study.

Influence of Traits and Situational Factors on Argument Structures

Motivations to Approach and Avoid arguments and Involvement

Argumentativeness is a communication trait which is likely an important factor in influencing how different structures are used in arguments. Infante and Rancer (1982) defined argumentativeness as “a generally stable trait which

predisposes the individual in communication situations to advocate positions on controversial issues, and to attack verbally the positions which other people take on these issues" (p.72). If a person is predisposed to approach arguments and is willing to expend his or her efforts on constructing arguments in interpersonal settings, it is likely that he or she is also motivated to approach the task of constructing private arguments and is willing to expend his or her efforts on accomplishing the task well. This speculation is possible if we consider that an argument is a result of an individual's thought process regardless of the context in which it takes place.

A trait is "a hypothetical construct that accounts for the way individuals behave when they are involved in communication-related activity" (Rancer & Avtgis, 2006, p.65). McCroskey, Daly, Martin, & Beatty (1998) note that "individual traits are a major force, if not the dominant explanation, for why people communicate the way they do" (p. vii).

In fact, argumentativeness has been found to be related to communication outcome variables (see review by Rancer & Avtgis, 2006). Also, there have been debates on whether argumentative traits or situational factors better explain variables related to people's argumentative communication (Infante, 1981; Onyekwere, Rubin, & Infante, 1991; Rancer & Infante, 1985; Stewart & Roach, 1993; Waggenspack & Hensley, 1989). Further, Infante (1987), taking an interactionist approach, suggests that knowledge of both trait and situational

factors is crucial in predicting people's motivation to engage in argumentative communication. Although these studies are valuable in exploring factors that explain people's argumentative communication, they employed outcome variables that were limited in scope. The variables were mainly observers' perceptions of individuals' communication or individuals' attitudes toward communication. Few studies have empirically examined the specific nature of arguments, particularly how individuals structure their arguments. Examining them will allow us to analyze the exact qualities of arguments to be explained by traits or situational factors, which details individuals' argumentative communication behavior more precisely than perceptions of or attitudes toward the behavior. For that reason, this study examines the relationship between argumentative communication traits and argument structures.

In examining how argumentativeness influences the structures used in written argument, the present study made two decisions. The first decision was to examine how a person's motivation to approach arguments (ARGap) and his or her motivation to avoid arguments (ARGav), not a person's general trait to be argumentative (ARGgt) which has been conceptualized as ARGap – ARGav, affect the use of different argument structures. The decision was made because ARGap and ARGav were conceptualized as two independent dimensions (Infante & Rancer, 1982). It is likely that they have different unique roles in affecting the manner in which people construct argument, not the two being the opposite sides

of the same coin.

The second decision was to examine the exact nature of a person's involvement in the issue (Abelson, 1988) of argument. Involvement refers to the importance or significance of the topic to an individual. Involvement in the issue of argument is likely to be a critical situational factor in predicting what structures will be used. Unlike traits that remain relatively constant, situational factors, including a person's involvement in the topic as well as other situational factors like the topic and the adversary's attributes, could vary across time or occasions.

There are studies that have implications for examining the relationship between involvement and argumentative communication. For example, Wegman (1994) examined written arguments constructed by 121 college students in the Netherlands and tested the effects of a person's involvement in the issue on the use of factual evidence in his or her argument. He found that the effects of involvement on the use of factual evidence were not straightforward: they were dependent on the context of the argument (majority position vs. minority position) and the attitude toward the issue (positive vs. negative). Given the results, we can infer that an individual's involvement appears to influence argument structures under certain conditions. The question of interest for the present study is: Is involvement interrelated with an individual's degree of motivations to approach or avoid arguments to affect argument structures? We need to find an answer to this question.

Onyekwere et al. found that high argumentatives were viewed as more competent communicators by their opponents in dyadic arguments. They also found that communication competence was higher when people were discussing topics that were high in involvement. Onyekwere, et al., therefore, found that both argumentativeness and involvement had significant main effects on the communication competence perceived by the opponents. However, we do not know much about the specific quality of the participants' arguments when they were evaluated as high or low in communication competence. Also, they did not examine specifically how the two variables were interrelated with one another to influence the outcome variable; they did not test whether there were interaction effects or possibly mediation effects between them. Given the situation, the present study will address these issues. This study thus aims at finding out specifically how ARGap, ARGav, and involvement may affect the structures used in written arguments. Before going on to the research questions for this study, I will define argument.

Definition of Argument

Following Suzuki (2006), this study defines argument rather broadly as: "a set of statements to express the communicator's opinion or belief, which may involve reasoning and logical appeals (p. 196)." This definition of argument is different from the definitions of argument in most traditional studies on argument which focus on logic and rational appeals (Reinard, 1991, as cited in Suzuki,

2006). There have been researchers who do not necessarily agree with the traditional perspective, conceptualizing argument as more comprehensive with other goals than winning or gaining acceptance, which should include such goals as informing or expressing (Suzuki, 2006). The definition used in the present study reflects such comprehensive view of argument.

Describing Argument Structures

To examine the structures used in a written argument, this study first describes argument based on the functional relations between elements or units of argument following Suzuki (2005, 2006). In the descriptive framework, horizontal as well as vertical functions for developing argument are covered. Horizontal relations are expansion relations not based on linear logic. On the other hand, vertical relations are reason-giving activities based on linear logic. The framework also allows us to examine argument in terms of macro- and micro-structures as well as the distribution of inter-unit relations that make up each structure. According to the framework, macro-structures refer to argument's global organizational patterns. "Micro-structures refer to the configuration of specific supporting or extending relationships among units of argument, which compose at least a part of an argument (Suzuki, 2006, p. 198)." To describe structures of written arguments, the present study uses the following indicators of macro- and micro-structures. First, the use of horizontal vs. vertical, or linear, macro-structure indicates whether an argument is reason-based or not. Second, the use of climactic

vs. anticlimactic macro-structure indicates the degree to which an argument is indirect, with delayed introduction of the main claim. Third, the proportion of the serial-type micro-reasoning structures to argument length indicates the depth of reasoning used to support the points offered in an argument. Fourth, the proportion of the compound-type micro-reasoning structures to argument length indicates the scope of reasoning used to support the points offered in an argument. Using this framework in the present study will demonstrate whether the framework is useful and valid in describing structures of argument.

Research Questions

There are at least three possible ways in which ARGap, ARGav, and involvement could affect the argument structures used. First, involvement could moderate the effects of ARGap or ARGav on argument structures. The moderating effects of involvement should be supported by significant interaction effects between ARGap and involvement or between ARGav and involvement (the Interaction Model). For example, the higher a person's ARGap, the more reason-based and direct his or her argument's macro-structure is likely to be and deeper and wider in scope its micro-reasoning structures are likely to be, only when he or she is highly involved in the topic of argument. Stated differently, involvement, a moderator variable, may be useful in identifying subgroups whose argument structures are particularly influenced by ARGap or ARGav. To find out if this model holds, the following research question was asked:

RQ1 (the Interaction Model): Are the interaction effects between the two trait factors (ARGap and ARGav) and involvement on argument structures significant?

Second, involvement could mediate the relationship between ARGap or ARGav and argument structures (the Mediation Model). It is possible that a person high in ARGap tends to be more involved in controversial issues in general because he or she is highly motivated to approach arguments and is more likely to be attentive to argumentative issues. Also, it is possible that a person high in ARGav tends to be less involved in controversial issues in general because he or she is not motivated to approach arguments and is less likely to be attentive to argumentative issues. Then, a person's ARGap or ARGav may affect his or her involvement in the issue, which in turn influences what structures are used in argument: the higher a person's involvement in the issue, the more reason-based and direct his or her argument's macro-structure is likely to be and deeper and wider in scope its micro-reasoning structures are likely to be. If this is the case, the effect of ARGap or ARGav is indirect rather than direct. Involvement, as a mediator variable, will explain how or why ARGap or ARGav influences argument structures. Given this possibility, the present study tests this model. The next research question, therefore, is:

RQ2 (the Mediation Model): Does involvement mediate the relationship between the two trait factors and argument structures?

Finally, either ARGap, ARGav, or involvement could only have simple main affects on argument structures, (the Simple Main Effects Model). If this is the case, each variable should affect the argument structures used independent of the other two variables. To find out if this model holds, the following research question was asked:

> RQ3 (the Simple Main Effects Model): Are the main effects of the two trait factors or involvement on argument structures significant?

The following section explains the method and procedure for testing the research questions.

Method

Participants

A survey was administered to Japanese college students at a university in the northern part of Japan. The respondents participated in the study on a voluntary basis. They were from seven different departments, including education, law, agriculture, fisheries, science, engineering, and medicine. In total, 254 students including 149 men and 105 women responded to the questionnaire. Out of the 254 responses, 229 including 130 from men and 99 from women turned out to be usable for analyses of this study. Non-usable responses included those from non-Japanese nationals and those that were incomplete. The average age of the respondents was 19.06 (SD = 2.68).

Procedure

The questionnaire was administered to the respondents by five instructors of English during regular class periods in two different semesters. The questionnaire asked the respondents to explain their position on whether or not capital punishment should be retained and to respond to the Argumentativeness Scale (Infante & Rancer, 1982) and to a scale to measure their involvement in the issue of capital punishment. In addition, it asked them to answer demographic questions.

The respondents' perceptions of their disposition to approach arguments (ARGap) and their disposition to avoid arguments (ARGav) were measured by Infante and Rancer's Argumentativeness Scale, which is a 20-item scale composed of 10 ARGap items and 10 ARGav items. Each response was measured on a five-point scale (1 = "The description hardly ever applies." to 5 = "The description almost always applies."). The Japanese version was the same as the one used in Suzuki and Rancer's (1994) study, in which they translated it from English into Japanese and back-translated it from Japanese into English (Brislin, 1976). Suzuki and Rancer (1994) confirmed the scale's two-dimensional factor structure for their Japanese sample. For the data used in the present study, Cronbach's alpha was .87 for the ARGap dimension and .80 for the ARGav dimension.

The respondents' degree of involvement in each issue was measured by three items taken from the scale developed by Abelson (1988), with slight

modifications added to them to make them match the context of this study. The questions were: How often do you think about the issue of capital punishment?" (1 = "almost never" to 7 = "very often"), "How concerned are you about the issue of capital punishment?" (1 = "not at all" to 7 = "to a very high degree") and "How important do you think the issue of capital punishment is?" (1 = "not at all important" to 7 = "very important"). These three questions were translated from English into Japanese by a bilingual person and back-translated from Japanese into English by another bilingual person. Minor revisions were made as a result of the translation process. Cronbach's alpha for the scale was .85.

Coding

The arguments that the respondents wrote on the issue were put into a file by a research assistant. The author segmented the data into units of analysis. Following Suzuki (2006), the unit of analysis was decided to be a thought turn, which was operationalized basically as an independent clause. The author unitized all the data. Also, 20% of the data were randomly selected. An independent coder unitized the data thus chosen. The independent coder had been trained by the author and kept unaware of the research questions. The time required for training the independent coder for the unitizing task in one training session was two hours. The unitizing reliability (Auld & White, 1956) was .91.

After completing the unitizing task, the author assigned a number to each unit in an ascending order, and coded each unit using a coding scheme (Suzuki,

2005, 2006). The coding procedure followed Suzuki (2006). It was decided which one of the following codes each unit in focus should be assigned. The codes include: (a) the argument's nuclear (NC) statement, which is the central claim, (b) a horizontally continuing (HC) clause which extends or expands another statement it is connected to, (c) a vertically subordinate (VS) clause which supports another statement by means of reasoning, and (d) a non-relevant (NR) clause which does not have any direct relevance to the argument of interest. Horizontally continuing and vertically subordinate clauses, respectively, were further classified into five subcategories. Subcategories for horizontally continuing clauses include (-CL) for clarification, (-RE) for repetition or rephrasing, (-AD) for addition, (-CI) for circumstance, and (-QU) for qualification. Subcategories for vertically subordinate clauses include (-GE) for generalization, (-CE) for cause and effect, (-AN) for analogy, (-DI) for discount, and (-QL) for quasi-logic (see Suzuki, 2006, for details). Appendix provides examples of arguments that were coded.

The author coded all the data. The 229 arguments from 229 respondents, which turned out to be usable, had a total of 1,147 units. All the twelve categories were used in coding the data. Out of the 229 arguments, 48 arguments, which approximately account for 20% of the data, were randomly chosen for checking the reliability of coding. An independent coder who had been trained by the author coded the data thus chosen. The independent coder had been kept unaware of the research questions of this study. The total amount of time required for training the

independent coder for the coding task in five training sessions was eleven hours. The 48 arguments had a total of 229 units in total. Cohen's kappa between the two coders for the four main categories of NC, HC, VS, and NR was .82. Cohen's kappa between the two coders for all the 11 categories was .81, excluding the subcategory of analogy, VS-AN, which was not used in coding the data in the subsample for reliability check.

Calculating Values for Indicators

The present study uses four indicators of argument structures. They include two macro-structural indicators and two indicators of micro-reasoning structures. Specifically, they are: (a) horizontal versus. vertical, or linear, macro-structure, (b) climactic versus. anticlimactic macro-structure, (c) the serial-type micro-reasoning structures, and (d) the compound-type micro-reasoning structures.

First, the first macro-structural indicator of argument is the use of (a) horizontal versus. vertical, or linear, macro-structure. It should indicate whether an argument is reason-based and linearly developed or not.

As explained in a previous section, macro-structures refer to arguments' global organizational patterns. Horizontal macro-structure, as proposed by Suzuki (2006), is exclusively composed of horizontal, or extending and expanding, functions with no support for the central claim by reasoning. Scholars have observed that people, particularly those who are not members of Western tradition,

may employ forms of argument other than linear logic. For example, Johnstone (1996) claims that telling stories, repeating, and paraphrasing are among the non-standard approaches to argument. Kaplan (1966) claims that examining a topic from a number of perspectives is another form of non-standard approach to argument. Suzuki (2006) maintains, ". . . examining horizontal macro-structure of argument may suggest an alternative to a linear mode of articulating a viewpoint including inductive and deductive forms (p.199)." Horizontal macro-structure can be interpreted as a manifestation of the value of cooperation which "suggests a shared, nonhierarchical, egalitarian form of communication" (Meyers, Brashers, Winston, Grob, 1997, p. 23). This being the case, this study examines the use of horizontal macro-structure, in which the central claim or NC is not supported by any reason or vertically subordinate (VS) statement as compared to the use of vertical, or linear, macro-structure that contains support or reasoning for the central claim.

Second, the second indicator of argument is the use of (b) climactic versus. anticlimactic macro-structure (Okabe, 1983). It should indicate the degree to which an argument is indirect, with delayed introduction of the main claim.

According to Okabe, those who follow anticlimactic principles of organization tend to place their strongest, most interesting points at the beginning of the series in each major part of a discourse, while those who follow climactic principles of organization tend to save the most interesting points for the end of

the series. Based on Okabe's argument, the present study decided that the location of the central claim, which is represented by the order in which it appears in the argument, divided by the total number of units in each argument should be an appropriate indicator of the degree to which the argument's macro-structure is climactic. That is, the earlier the central claim is presented, the more the argument is anticlimactic, which is indicated by a smaller value of the indicator. There could be an argument which is composed of only one statement, which is most likely to be NC. The value for indicator (b) was not computed for this type of argument because it is hard to decide how climactic the argument is.

Third, the serial-type micro-reasoning structure was examined. The use of the serial-type micro-reasoning structures is represented by the proportion of the serial-type micro-reasoning structures to argument length. It should indicate the depth of reasoning used to support the points offered in an argument.

As explained in a previous section, micro-structures refer to a configuration of specific supporting or extending relationships among units of argument, which compose at least a part of an argument. A serial-type micro-reasoning structure means a micro-structure in which a statement is supported by a reason, or VS (vertically subordinate) statement, which is further supported at least by one reason. Past researchers (Freeman, 1991; Read & Marcus-Newhall, 1993; Thagard, 1989) identified the serial-type reasoning structures.

The degree to which the serial-type micro reasoning structures were

employed was measured in the following manner. If the argument employs one reason supporting a statement, which is further supported by a reason, the value is two. If the argument employs two reasons supporting a statement in a serial fashion, the value is three, and so on. In the presence of multiple cases of the serial-type micro-reasoning structures in one argument, the values were summed up. Then, the total value was divided by the total number of units in the argument so that the value would not be confounded by the argument's length.

Finally, the compound-type micro-reasoning structure was examined. The use of the compound-type micro-reasoning structures is represented by the proportion of the compound-type micro-reasoning structures to argument length. It should indicate the scope of reasoning used to support the points offered in an argument. A compound-type micro-reasoning structure means micro-structure in which a statement is directly supported by at least two different reasons or VS (vertically subordinate) statements. Past researcher (Freeman, 1991; Read & Marcus-Newhall, 1993; Thagard, 1989) also identified this type of reasoning structure.

The degree to which the compound-type micro-reasoning structures were employed was measured in the following manner. If the argument employs two different reasons directly supporting a statement, the value is two. If it employs three different reasons to directly support a statement, the value is three, and so on. In the presence of multiple cases of the compound-type micro-reasoning

structures in one argument, the values were summed up. Then the total value was divided by the total number of units in the argument so that the value would not be confounded by the argument's length.

Analysis

To answer the three research questions, logistic and multiple regression analyses were conducted, depending on whether the dependent variable was categorical or continuous. In the analyses, all the independent variables were centered (Aiken & West, 1991).

Testing for dependent variables (a) through (d) progresses as follows. To answer RQ1 (the Interaction Model), ARGap and ARGav are entered first, and involvement is entered next. After that, one of the two interaction terms (either ARGap x involvement or ARGav x involvement) is entered, and the other interaction term is entered last. The order of entry for the two interaction terms is alternated, and only the last interaction term is interpreted for significance, as recommended by Pedhazur (1997) and Cohen and Cohen (1983). The presence of significant interaction effects, which answers RQ1 (the Interaction Model) in the affirmative, indicates that the effects of ARGap or ARGav on the dependent variable vary depending on the values of involvement. In that case, the main effects of ARGap or ARGav have to be tested for two different groups of respondents with high and low involvement in the issue, to examine the specific nature of the interaction. In the absence of significant interaction effects, which

answers RQ1 in the negative, the analysis proceeds to the tests for RQ2 (the Mediation Model) and RQ3 (the Simple Main Effects Model).

Tests for RQ2 (the Mediation Model) follows the procedure recommended by Baron and Kenny (1986). It should be noted that in Baron and Kenny's procedure the effects are likely biased if the mediator is measured with less than perfect reliability (Jaccard & Wan, 1996; Kenny, 2005). In the present study, however, the reliability of the mediator, involvement, was .85, which was reasonably high, making Baron and Kenny's procedure an acceptable approach. Baron and Kenny gave the following recommendations for examining mediation. They are: (a) the independent variable predicts the dependent variable; (b) the independent variable predicts the mediator; and (c) controlling for the independent variable, the mediator predicts the dependent variable, and (d) the effect the independent variable on the dependent variable controlling for the mediator should be zero, which is a case of complete mediation. If (d) is not met, then partial mediation is indicated.

Following the procedure, the present study first determines whether ARGap or ARGav predicts the dependent variable, using logistic regression analysis for a categorical dependent variable and multiple regression analysis for a continuous dependent variable. Second, after establishing the association between ARGap or ARGav and the dependent variable, it tests whether ARGap or ARGav predicts involvement, using simple regression analysis for all of the dependent variables.

Third, after establishing the association between ARGap or ARGav and involvement, it tests whether involvement predicts the dependent variable, controlling for ARGap and ARGav. In cases where the effect of the ARGap or ARGav on the dependent variable controlling for involvement drops, the Sobel test (Baron & Kenny, 1986) is used to determine whether the drop is statistically significant. If the drop turns out to be significant, RQ2 is answered in the positive. If neither RQ1 (the Interaction Model) nor RQ2 (the Mediation Model) is answered in the positive, simple main effects (RQ3) of ARGap, ARGav, and involvement on the dependent variable are examined.

Results

Table 1 shows means and standard deviations for the variables used in the analysis, while Table 2 shows correlations among the variables. The level of significance was set at .05 for the analyses in this study. The power of the tests was estimated.[2]

Tests for (a) Horizontal versus. Vertical Macro-Structure

To test for dependent variable (a), the use of horizontal (coded as 0) versus. vertical (coded as 1) or linear macro-structure, logistic regression analysis was conducted, except for testing the association between involvement and the dependent variable for which simple regression analysis was employed. Results indicated that neither interaction terms, ARGap x involvement (B = .01, $Wald$ = 0.91, p = .340) nor ARGav x involvement (B < .01, $Wald$ = 0.11, p = .740), was

significant. RQ1 (the Interaction Model) was answered in the negative.

For RQ2 (the Mediation Model), ARGap predicted the use of horizontal versus. vertical macro-structure (B = .06, *Wald* = 6.30, p = .012, Nagelkerke R^2 = .05). Nagelkerke R^2 is an analogue to R^2 in linear regression (Tabachnick & Fidell, 2001); the greater a person's ARGap, the more likely he or she is to use vertical macro-structure. ARGap also predicted involvement (β = .38, t = 6.52, p < .001); the greater a person's ARGap, the greater his or her involvement in the issue. However, ARGav did not predict the use of horizontal versus. vertical macro-structure (B = .01, *Wald* = 0.06, p = .808). Involvement was then added to the equation, and it predicted the use of horizontal versus. vertical macro-structure (B = .16, *Wald* = 9.77, p = .002, Nagelkerke R^2 = .12) when ARGap and ARGav were included in the model. At the same time, however, the effect of ARGap on the dependent variable diminished (B = .04, *Wald* = 2.01, p = .156). The greater a person's involvement in the issue, the more likely he or she is to use vertical macro-structure. The Sobel test indicated that the drop in the direct effect of ARGap on the dependent variable was significant (z = 2.85, p = .002). The results answered RQ2 in the affirmative for ARGap. Because RQ2 was answered in the affirmative for ARGap and because ARGav had no significant effects on dependent variable (a), RQ3 (the Simple Main Effects Model) was answered in the negative. Table 3 presents the results.

Tests for (b) Climactic versus. Anticlimactic Macro-Structure

For dependent variable (b), the use of climactic versus. anticlimactic macro-structure, multiple regression analysis was conducted. Thirteen out of a total of 229 arguments from 229 responses consisted of only one unit, which was coded as NC, and was excluded from the analysis. The results indicated that neither interaction terms, ARGap x involvement (β = -0.07, t = -0.92, p = .360) nor ARGav x involvement (β = -0.06, t = -0.74, p = .462), was significant. Thus, RQ1 (the Interaction Model) was answered in the negative.

For RQ2 (the Mediation Model) and RQ3 (the Simple Main Effects Model), ARGap predicted the use of climactic versus. anticlimactic macro-structure (β = -0.22, t = -3.36, p < .001, explaining 5.0% of the variance). That is, the greater a person's ARGap, the more likely he or she is to use anticlimactic macro-structure. ARGap also predicted involvement (β = 0.38, t = 6.52, p < .001). ARGav, however, did not predict the use of climactic versus. anticlimactic macro-structure (β = -0.06, t = -0.86, p = .389). Involvement was then added to the equation, but it did not predict the use of climactic versus. anticlimactic macro-structure (β = -0.06, t = -0.87, p = .386). Given the results, RQ2 was answered in the negative, while RQ3 was answered in the positive for ARGap, but not for ARGav or involvement. Table 4 presents the results.

Tests for (c) the Serial-Type Micro-Reasoning Structure

Before conducting the analysis for dependent variable (c), it was found that the error distributions and the distributions of this dependent variable indicated

signs of non-normality, possibly violating one of the assumptions of multiple regression. They may be because of relatively small number of cases employing this type of micro-reasoning structures (33 out of 229 cases) and because of the lack of sufficient variation in the values of this dependent variable. Therefore, it was decided to regard the variable as categorical (that is, 0 = “not used any serial-type micro-reasoning structure”, and 1 = “used at least one serial-type micro-reasoning structure”), but not as a continuous variable as originally planned. Following the decision, logistic regression analysis was conducted. Results indicated that neither interaction terms, ARGap x involvement (B = -.01, *Wald* = 0.45, p = .99) nor ARGav x involvement (B = -.01, *Wald* = .45, p = .99), was significant. RQ1 (the Interaction Model) was answered in the negative.

For RQ2 (the Mediation Model), ARGap did not predict the use of the serial-type micro-reasoning structures (B = .04, *Wald* = 2.02, p = .16). Neither did ARGav (B = -.04, *Wald* = 1.78, p = .18). When involvement was added to the equation, however, it predicted the use of the serial-type micro-reasoning structures (B = .31, *Wald* = 16.30, $p < .001$), contributing to Nagelkerke R^2 change by .16. Given the results, RQ2 was answered in the negative, while RQ3 was answered in the positive for involvement, but not for ARGap or ARGav. Table 5 presents the results.

Tests for (d) the Compound-Type Micro-Reasoning Structure

For dependent variable (d), the proportion of the compound-type

micro-reasoning structures to argument length, multiple regression analysis was conducted. As a result, neither interaction terms, ARGap x involvement (β = -0.02 t = -0.26 p = .798) nor ARGav x involvement (β = 0.01, t = 0.19, p = .846), was significant. Thus, RQ1 (the Interaction Model) was answered in the negative.

For RQ2 (the Mediation Model) and RQ3 (the Simple Main Effects Model), ARGap did not predict the proportion of the compound-type reasoning structures to argument length (β = 0.09, t = 1.38, p = .169). ARGav did not predict this dependent variable, either (β < 0.01, t = 0.01, p = .989). When involvement was added to the equation, however, it predicted the proportion of the compound-type micro-reasoning structures to argument length (β = 0.19, t = 2.67, p = .008, explaining an additional 3% of the variance). Given the results, RQ2 was answered in the negative, while RQ3 was answered in the positive for involvement, but not for ARGap or ARGav. Table 6 presents the results.

Discussion

To examine how ARGap and ARGav, two communication trait factors, and involvement, a situational factor, account for the way an individual structures his or her written argument, this study offered three research questions. They were posited to investigate which of the three models—the Interaction Model, the Mediation Model, and the Simple Main Effects Model—would be the best one to explain the relationships. The results suggest that the Mediation Model and the Simple Main Effects Model are viable models, depending on the type of argument

structure. The Interaction Model did not fare well in any case.

RQ1 (the Interaction Model) was answered in the negative for all of the structural indicators. Given the results, although ARGap is a significant predictor of the two types of macro argument structures, its effects on the argument structures are not modified by the strength of a person's involvement in the issue.

In contrast, the Mediation Model (RQ2) has been found to be viable for the use of horizontal versus. vertical macro-structure. That is, the greater a person's ARGap, the more likely he or she is to use a reason-based argument—but largely to the extent that his or her general motivation to approach arguments influences involvement in the issue, or his or her issue-specific commitment. In that sense, involvement represents a mechanism through which ARGap influences the use of horizontal versus. vertical macro-structure and provides a target for intervention.

RQ3 (the Simple Main Effects Model) was answered in the affirmative for three structural indicators. Specifically, ARGap had simple main effects on the use of climactic versus. anti-climactic macro-structures, and involvement on the serial-type and the compound-type micro-reasoning structures. The results suggest that ARGap and involvement appear to explain different aspects of arguments, respectively.

Given that a person greater in ARGap is more likely to use anticlimactic macro-structure, ARGap is seemingly related to a person's preference for a more direct way of structuring arguments; the main claim is presented early in an

anticlimactic argument. This is likely to be because a person who has high general motivation to approach arguments tends to be skilled in arguing, thus knows how to make a point in an argument. It is possible, therefore, that ARGap explains aspects of argument that mainly concern macro-structuring skills.

In contrast, a person's involvement in the issue appears to be related to his or her preference and ability for using more complex micro-reasoning structures, such as the serial-type or the compound-type. It can be reasoned as follows. A person who has a great issue-specific commitment should be familiar with the context surrounding the issue. As such, he or she should be knowledgeable enough to list more reasons to support a statement including his or her main claim and to relate the reasons to one another to structure them in a complex and presumably effective manner. According to the finding, the fact that an individual has high general motivation to approach arguments or ARGap does not help him or her much to construct complex micro-reasoning structures in arguments. To summarize, although ARGap and involvement are the two important variables that explain argument structures, each appears to play a different part in the construction of arguments.

Finally, although a person's ARGap influences the use of the two macro-reasoning structures of arguments, ARGav does not. The two motivational traits, as originally conceptualized by Infante and Rancer (1982), are not the opposite sides of the same coin. The findings from the present study support this

conceptualization. Assuming that ARGap represents the degree to which he or she is active and capable in communicating his or her points and the degree to which he or she enjoys arguments, we are not surprised to find that ARGap predicts the use of reason-based and direct macro-structures.

With regard to ARGav, however, person's dislike of talking about controversial issues or his or her anxiety about arguing does not influence the structures of the argument he or she constructs by itself. It can be interpreted that a person constructs a reason-based and direct argument, for example, regardless of the negative sentiment he or she has toward arguments. On the other hand, one other interpretation is possible. That is, ARGav is not a good predictor of the structures of written arguments because a person is relatively free from anxiety when he or she argues privately in the absence of a specific audience. If this is true, it is possibly a finding from this study that cannot be extrapolated to the discussion of arguments in interpersonal or public contexts. It needs to be tested by repeating a similar examination in other contexts to see whether the same finding would hold true.

Also, it should be noted that the correlation between ARGap and ARGav was -.20 in the present study. It is relatively low considering Hamilton and Mineo's (2002) finding that the average weighted correlation between ARGap and ARGAv across the five studies they reviewed was -.28 and -.33 when they corrected the value for average alphas obtained from their meta-analysis. The

relatively low correlation between ARGap and ARGav in the present study could be one reason that ARGap was found to be a good predictor, while ARGav was not. Further research is necessary to see how much the findings could vary with sample-specific characteristics such as the correlation between ARGap and ARGav.

This study is valuable in the following respects. First, it provides an explanation for why people construct arguments the way they do. It specifies exactly how argumentative traits and involvement interrelate to one another to explain argument structures, revealing a little complex but interpretable mechanism. Thus, this study contributes to the theoretical development in research on argumentative communication.

Second, it has a pedagogical value. That is, this study suggests that teachers can help their students construct arguments well in two important ways, provided that, for example, arguments with reason-based and direct macro-structures and complex micro-reasoning structures are desired. One way is to teach their students' necessary skills in argument, which will increase their motivation to make constructive arguments or ARGap. The other way is to provide information on specific issues for arguments in their classrooms for the purpose of increasing the students' involvement in the issues.

Third, it demonstrated that the framework for describing argument structures used in the present study is useful and reliable. Considering that the

independent and mediating variables successfully predicted the dependent variables derived from the framework, we obtained a piece of positive evidence regarding the validity of the framework. It may be fruitfully applied to the analysis of argument structures in the future.

This study is limited in two respects. First, the issue used in this study was a social issue. People may argue differently on different types of issues, e.g. personal or domestic issues. Second, this study examined people from one cultural group. It needs to be seen whether the same findings hold true for people from other cultural contexts as well. Future research will take these issues into consideration and contribute to exploring in more detail the potential factors that motivate individuals to structure argument.

Appendix

Examples of Coded Script

Argument A

unit number	argument	code	unit number it connects to
(1)	I basically believe that the death penalty should be retained.	NC	
(2)	There might be some rare exceptions.	HC-QU	(3)
(3)	However, because humans abhor their own death more than anything else,	VS-QL	(4)
(4)	retaining the death penalty will lead to the prevention of crimes.	VS-CE	(1)
(5)	I would like more information be disclosed about each case if the capital punishment is going to be retained.	HC-CL	(1)

(6) I think the time and the place of the execution and the specifics of the crime that the executed committed should be reported.	HC-CL (5)	

Note. Argument A has (a) a vertical macro-structure, because its main claim, NC, is supported by one or more reasons. Its (b) climacticity score is .17 = 1 (the location of the NC) / 6 (the total number of units). The argument's (c) use of the serial-type micro-reasoning structures is 1, and its (d) proportion of the compound-type micro-reasoning structures to argument length is 0 = 0 / 6.

Argument B

unit number	argument	code	unit number it connects to
(1)	Because those criminals who are sentenced to death committed very serious crimes,	VS-QL	(2)
(2)	I do not see any moral problem about putting them to death.	HC-QU	(3)
(3)	However, I do not think it it's a good idea to allow them to put an end to their lives using the death penalty.	VS-QL	(6)
(4)	We can introduce life in prison without parole to make the criminals pay the penalty for their crimes for the rest of their lives.	HC-CL	(3)
(5)	Also, I hear that there have been some criminals who were falsely accused and sentenced to death.	VS-QL	(6)
(6)	For these two reasons, I think it is best to replace the death penalty by other forms of punishment.	NC	

Note. Argument B has (a) a vertical macro-structure, because its main claim, NC, is supported by one or more reasons. Its (b) climacticity score is 1.0 = 6 (the location of the NC) / 6 (the total number of units). The argument's (c) use of the serial-type micro-reasoning structures is 0, and its (d) proportion of the compound-type micro-reasoning structures to argument length is .33 = 2 / 6.

Argument C

unit number	argument	code	unit number it connects to
(1)	A novel that I read the other day made me think about capital punishment.	HC-CI	(5)
(2)	The author of the novel writes about both advantages and disadvantages of capital punishment.	HC-CL	(1)
(3)	Although I approve of giving capital punishment to those criminals who committed very serious crimes,	HC-QU	(4)
(4)	I think it is not easy to judge if a crime is so serious that the criminal has to be sentenced to death.	HC-CL	(5)
(5)	But I personally believe that capital punishment should be retained.	NC	

Note. Argument C has (a) a horizontal macro-structure, because its main claim, NC, is not supported by any reason. Its (b) climacticity score is 1.0 = 5 (the location of the NC) / 5 (the total number of units). The argument's (c) use of the serial-type micro-reasoning structures is 0, and its (d) proportion of the compound-type micro-reasoning structures to argument length is 0 = 0 / 5.

Notes

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[2]Power analysis was conducted using PASS 2008 (Hintze, 2008), a power analysis and sample size software program, for the logistic regression analysis that

was used to test the categorical dependent variables. For a sample size of 250 observations, with the level of significance set at .05, with a moderate odds ratio, which is an index of effect size in logistic regression, being 2.0, the power of the analysis was .99. Odds ratio of 2.0 in this case meant a change in the probability of Y, the binary dependent variable, = 1 from the value of 0.8 (P1) at the mean of X, the independent variable, to 0.889 (P2) when X is increased to one standard deviation above the mean. That is, it is [P1/(1-P1)] / [P0/(1-P0)].

Power analysis was also conducted for the multiple regression analyses that were used to test for the rest of the dependent variables. For a sample size of 250 observations, with the level of significance set at .05, and with a moderate effect size of f^2 = .15, the power of the analyses was above .99.

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Table 1

Means and Standard Deviations

	M	*SD*
ARGap [a]	28.67	7.77
ARGav [a]	27.27	6.62
Involvement [b]	13.62	3.88
Horizontal versus. vertical macro-structure [c]	0.81	0.40
Climactic versus. anticlimactic macro-structure [d]	0.59	0.36
Serial-type micro-reasoning structures [e]	0.14	0.35
Compound-type micro-reasoning structures [f]	0.14	0.21

Note. N = 229 except for climactic versus. anticlimactic macro structure, for which N = 216.

[a] Motivation to approach arguments or ARGap was measured by ten items on a five-point scale (1 = "The description hardly ever applies." to 5 = "The description almost always applies."). The same was true for motivation to avoid arguments or ARGav.

[b] Involvement was measured by three items on a five-point scale. (1 = "almost never" to 7 = "very often"), (1 = "not at all" to 7 = "to a very high degree"), and (1 = "not at all important to 7 = "very important").

[c] This is a dichotomous variable; horizontal macro-structure was coded as 0, while vertical macro-structure was coded as 1. Of the 229 responses, 43 had horizontal macro-structure, in which the central statement or NC is not supported by any reason or vertically-supporting (VS) statement. 186 responses had vertical or linear macro-structure, which contains support or reasoning or vertically-supporting (VS) statements for the central claim (NC). The 43 arguments with horizontal macro structure included 13 arguments which consisted of only one unit coded as NC.

[d] This signifies the relative location of the central claim, represented by the order in which the central claim appears in the argument, divided by the total number of units. Thirteen one-unit arguments were excluded from the analysis because it was hard to decide on the climacticity of arguments consisting of only one unit.

[e] This is a categorical variable. When an argument had no serial-type micro-reasoning structure, it was coded as 0. When an argument had one or more serial-type micro-reasoning structure, it was coded as 1.

[f] the proportion of the compound-type micro reasoning structures in an argument to argument length

Table 2

Intercorrelations

Variables	1	2	3	4	5	6	7
1. ARGap	--						
2. ARGav	-.20**	--					
3. Involvement	.38**	-.02	--				
4. Horizontal/vertical macro structure	.17*	-.01	.26**	--			
5. Climactic/anticlimactic macro structures	-.22**	-.01	-.15*	-.06	--		
6. Serial-type micro reasoning structure	.12	-.11	.26**	.20**	-.03	--	
7. Compound-type micro reasoning structures	.09	-.02	.21**	.34**	-.02	.08	--

Note. $N = 229$ except for climactic versus. anticlimactic macro-structure, for which $N = 216$. Significant at $p < .01$** and $p < .05$* (two-tailed).

Table 3

Logistic Regression Analysis with Horizontal/Vertical Macro Structure as the Dependent Variable

Step and Variables	Nagelkerke R^2	*B*	*Wald*
Step 1: ARGap	.05	.06	6.30*
ARGav		.01	0.06
Step 2: involvement	.12	.16	9.77**
(ARGap)[a]		.04	2.01
Step 3: ARGap x involvement	.12	.01	0.91
ARGav x involvement	.12	<.01	0.11

Note. [a] When involvement was added to the equation in Step 2, the effect of ARGap on the dependent variable diminished. The Sobel test indicated that the drop in the direct effect of ARGap on the dependent variable was significant (z = 2.85, p = .002).

Significant at p < .01** and p < .05* (two-tailed). N = 229.

Table 4

Multiple Regression Analysis with Climactic/Anticlimactic Macro-Structure as the Dependent Variable

Step and Variables	R^2	β	t
Step 1: ARGap	.05	-0.22	-3.36**
ARGav		-0.06	-0.86
Step 2: involvement	.05	-0.06	-0.87
Step 3: ARGap x involvement	.06	-0.07	-0.92
ARGav x involvement	.06	-0.06	-0.74

Significant at $p < .01$** (two-tailed). $N = 216$.

Table 5

Logistic Regression Analysis with the Use of the Serial-Type Micro-Reasoning Structures as the Dependent Variable

Step and Variables	Nagelkerke R^2	*B*	*Wald*
Step 1: ARGap	.04	.04	2.02
ARGav		-.04	1.78
Step 2: involvement	.20	.31	16.30**
Step 3: ARGap x involvement	.20	-.01	0.45
ARGav x involvement	.20	-.01	0.45

Significant at $p < .01$** (two-tailed). $N = 229$.

Table 6

Multiple Regression Analysis with the Use of Compound-Type Micro-Reasoning Structures as the Dependent Variable

Step and Variables	R^2	β	t
Step 1: ARGap	.01	.09	1.38
ARGav		< 0.01	0.01
Step 2: involvement	.04	0.19	2.67**
Step 3: ARGap x involvement	.04	-0.02	-0.26
ARGav x involvement	.04	0.01	0.19

Significant at $p < .01$** (two-tailed). $N = 229$.