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Cognitive Processing of One- and Two-sided Persuasive Messages

JEROLD L. HALE, PAUL A. MONGEAU, and RANDI M. THOMAS

Studies regarding message sidedness and persuasion indicate that sidedness effects are moderated by the type of two-sided message employed, but do not indicate why various messages differ in persuasiveness. This research tests two causal models of cognitive processing. Model 1 posits that messages produce general evaluations that prompt the generation of cognitions. Model 2 suggests messages prompt cognitions upon which subsequent evaluations are based. The data are consistent with Model 2 and inconsistent with Model 1 and begin to demonstrate how one-sided, nonrefutational two-sided, and refutational two-sided messages are processed.

THE SOURCE OF A PERSUASIVE MESSAGE has at her/his disposal numerous language strategies for the composition of the message. One choice the source must make is whether to present a one-sided or a two-sided message. A one-sided message presents only arguments favoring the position advocated by the source and a two-sided message presents both arguments opposing the source's position and those favoring it (Hovland, Lumsdaine, & Sheffield, 1949).

A substantial body of literature has accumulated concerning the persuasive effects of one-sided and two-sided messages (for a review see Allen, 1991), and it indicates that the effects of message sidedness are moderated by the type of two-sided message employed (Allen, 1991; Allen, et al., 1990). Specifically, Allen reports that operationalizations of message sidedness differ in important ways. Some messages labeled "nonrefutational" are composed of both arguments favoring the source's position and opposing arguments, but do not include direct refutation of the opposing arguments (e.g., Bettinghaus & Basehart, 1969). Other two-sided messages labeled "refutational," include supporting arguments directly refuting the opposing ones (e.g., McCroskey, Young, & Scott, 1972). The accumulated research shows refutational two-sided messages are more persuasive than both one-sided messages and nonrefutational two-sided messages (Allen, 1991; Allen et al., 1990).

While a compelling case can be made for the type of appeal as a moderator of sidedness effects, research on the issue does not provide

JEROLD L. HALE is an Associate Professor of Speech Communication at The University of Georgia. PAUL A. MONGEAU is an Assistant Professor of Communication at Miami University. RANDI M. THOMAS is a law student at Vanderbilt University.

insight as to why the messages differ in persuasiveness. One approach that can be taken to address this issue is to study message recipients' cognitive processes. The study of cognitive processes is a rapidly growing focus of the study of social influence (e.g., Eagly & Chaiken, 1984; Petty & Cacioppo, 1986; Petty, Ostrom, & Brock, 1981). From the literature on cognitive processing and persuasion two causal models of the effects of message sidedness can be posited.

Model 1

Model 1 may be inferred from Petty and Cacioppo (1986)[1] who argued that:

> if under scrutiny the message arguments are found to be cogent and compelling, favorable thoughts will be elicited that will result in attitude change in the direction of advocacy. (p. 70)

With regard to message sidedness effects, different sidedness operationalizations produce different initial evaluations, i.e., judgments of message quality. Those evaluations, in turn, lead to the generation of different patterns of cognitions. The cognitions generated determine the degree to which a message recipient's attitude will mirror the position advocated by the source.

This model can also explain the results of recent sidedness investigations (Allen, 1991; Allen et al., 1990) where refutational two-sided messages were found to be more persuasive than either nonrefutational two-sided messages or one-sided messages. Specifically, the direct refutation of opposing arguments in a refutational two-sided message may be perceived as more cogent and reasonable than either a nonrefutational two-sided message or a one-sided message.

From the preceding discussion a simple causal string can be inferred where message sidedness leads to an evaluation of the message, i.e., are the arguments cogent and reasonable? That evaluation should prompt the generation of positive cognitions. The cognitions generated will influence recipients' attitudes.

Model 2

Model 2 contains the same elements as the previous model but in a different causal order. It is reasonable to suggest that different operationalizations of message sidedness lead to different patterns of generated cognitions, and that those cognitions will influence judgments of whether the message is cogent and reasonable. Moreover, the message evaluation could determine the degree to which the advocacy influences the receiver's attitude.

This model can also account for recent sidedness research reporting that refutational two-sided messages are more persuasive than either nonrefutational two-sided messages or one-sided messages. Specifically,

the direct refutation of opposing arguments may lead to the generation of more positive cognitions than simply mentioning, and failing to refute, opposing arguments or presenting only supporting arguments.

Model 2 differs from the previous model only insofar as it reverses the causal order of the "message evaluation" and "generation of cognitions" steps of the process. It posits that sidedness influences cognitions, which influence evaluations, which influence attitudes.

METHOD

Participants

Participants were 194 undergraduate volunteers at a Midwestern university. Their participation partially fulfilled a department research requirement.

Design

A posttest-only design with independent groups was employed. Message sidedness was experimentally varied so that participants received a one-sided, nonrefutational two-sided, or refutational two-sided message concerning comprehensive economic sanctions against South Africa. The one-sided message presented only arguments supporting economic sanctions. The nonrefutational two-sided message included a series of arguments supporting sanctions followed by a series of arguments opposing sanctions. This procedure is similar to two-sided operationalizations used in several sidedness studies (Allen, 1991). The refutational two-sided message yoked pairs of arguments together so that an argument opposing sanctions was followed by a refutational argument supporting sanctions against South Africa. This procedure is also similar to the two-sided message operationalizations found in many sidedness studies (see Allen, 1991).

Procedure

Participants were told the research was a survey of students' opinions concerning legislation enacting comprehensive economic sanctions against South Africa. Each participant was given a packet containing informed consent materials, a message, and a questionnaire to be used in evaluating the message. Participants read the message, completed the questionnaire, were debriefed, and dismissed.

Measures

Attitudes. Attitudes toward the advocated position were assessed using five seven-interval semantic differential scales. The items included negative-positive, favorable-unfavorable, approving-disapproving, supportive-defensive, and agreeable-disagreeable. The items formed a unidimensional and reliable measure (*alpha* = .93).[2]

Message evaluation. Seven semantic differential items were included to assess a receiver's evaluation of the message. The items included biased-unbiased, unfair-fair, disorganized-organized, uninformed-informed, inaccurate-accurate, confusing-clear, complete-incomplete. The message evaluation scales formed a unidimensional and reliable measure (*alpha* = .88).

Generated cognitions. Cognitions were measured by asking participants to write down any thoughts they recalled having as they read the message. Subjects subsequently coded whether each cognition was positive, negative, or neutral.

RESULTS

Replicating the Sidedness Effects

Before testing the cognitive processing models presented previously, the consistency of these data with those reported by Allen (1991) were assessed. Separate sidedness-attitude correlations were computed for nonrefutational and refutational two-sided messages. In all cases, positive correlations indicated the two-sided message was more persuasive than the one-sided message and negative correlations indicated the one-sided message was more persuasive than the two-sided message. For participants who received either a one-sided message or a nonrefutational two-sided message, the sidedness-attitude correlation was $r = -.10$. For participants receiving either a one-sided message or a refutational two-sided message, the sidedness-attitude correlation was $r = .09$. These two correlations are significantly different from one another. Moreover, both are within sampling error of the corresponding correlations from Allen's (1991) meta-analysis.[3]

Testing Model 1

Each model was tested separately including one-sided and nonrefutational two-sided messages in one test, and one-sided and refutational two-sided messages in the other. The models were tested using LISREL VI (Joreskog & Sorbom, 1985), and if a model fit the data the deviations between predicted and obtained correlations for the variables in the model were less than expected by sampling error.

Model 1 with nonrefutational messages. The matrix of observed and predicted correlations between all of the variables in the model are presented in Table 1. The model including path coefficients is shown in Figure 1.

Results indicated the data are inconsistent with the model. The chi-square goodness-of-fit test was significant and substantial, χ^2 (3) = 100.00, $p = .001$. The goodness-of-fit index was 0.79, while the adjusted goodness-of-fit index was 0.29. The sum of the squared error was quite large (.49), and the variance explained by the model was trivial, $R^2 = .04$.

TABLE 1
Correlation/Error Matrix for Both Models Using
Nonrefutational Two-sided Messages

	SIDES	EVALUATION	COGNITIONS	ATTITUDE
SIDES		.00/.05	.11*/.00	−.10*/−.12*
EVALUATION	−.03		.00/.00	.69*/.00
COGNITIONS	.10	.23		.00/.02
ATTITUDE	−.10	.73	.19	

Correlations are below the diagonal. Deviations between predicted and obtained correlations are above the diagonal (Model 1/Model 2).
(*) denotes deviations greater than sampling error.

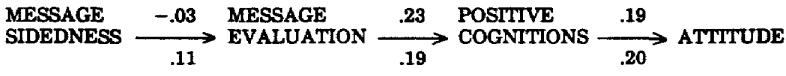

Figure 1. Model 1: Message evaluation precedes generation of cognitions. Path coefficients for Nonrefutational two-sided data are above path and coefficients for Refutational two-sided data are below path.

The model provided a poor fit to the data and the LISREL analyses revealed several significant deviations. The most substantial deviation occurred for the evaluation-attitude correlation, where the predicted correlation was substantially smaller than the obtained one. A deviation of this sort indicates that general message evaluations most likely have a direct effect on attitudes, and does not suggest that some other variable may mediate the relationship between evaluations and attitudes. That, of course, is exactly what was posited by Model 2.

Model 1 with refutational messages. The matrix of predicted and observed correlations between all variables in the model are shown in Table 2. Model 1 does not fit the data when refutational two-sided messages are employed. The Chi-square goodness-of-fit test was statistically significant and substantial, $\chi^2(3) = 64.89$, $p = .001$). The goodness-of-fit index was 0.83, and the adjusted goodness-of-fit index is 0.44. The sum of the squared error for the model was large (.38), and very little variance was explained by the model, $R^2 = .04$. As was the case with the previous test of the model, there was a substantial deviation between the predicted and obtained evaluation-attitude correlation. Such an error indicates that the influence of evaluations on attitudes is probably direct. This finding is consistent with the process posited in Model 2. The model, complete with path coefficients is presented in Figure 2.

TABLE 2
Correlation/Error Matrix for Both Models Using Refutational Two-sided Messages

	SIDES	EVALUATION	COGNITIONS	ATTITUDE
SIDES		.00/.08	.16*/.00	.09/.07
EVALUATION	.11		.00/.00	.59*/.00
COGNITIONS	.18	.19		.00/.08
ATTITUDE	.09	.63	.20	

Correlations are below the diagonal. Deviations between predicted and obtained correlations are above the diagonal (Model 1/Model 2).
(*) denotes deviations greater than sampling error.

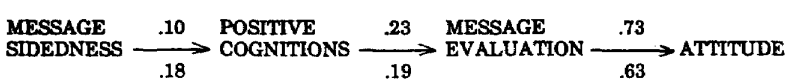

Figure 2. Model 2: Message evaluation precedes generation of cognitions. Path coefficients for Nonrefutational two-sided data are above path and coefficients for Refutational two-sided data are below path.

Testing Model 2

As was the case with Model 1, this model was tested separately for each two-sided message type. The results were similarly organized.

Model 2 with nonrefutational messages. The correlation/deviation matrix for the variables included in this model are shown in Table 1.

Model 2 fit the nonrefutational two-sided message data nicely. The chi-square goodness-of-fit test was insignificant, $\chi^{2\ [3]} = 2.44$, $p = .49$. The goodness-of-fit index was 0.99 while the adjusted index was 0.97. The values were indicative of small errors of prediction. Similar evidence was provided by the sum of squared errors (.001). Moreover the variance explained by Model 2 was substantial, $R^2 = .53$. Figure 1 shows this causal model complete with the obtained path coefficients.

Model 2 with refutational messages. The predicted and obtained correlations for Model 2 using refutational two-sided messages are shown in Table 2.

Model 2 fit the refutational two-sided message data well. The chi-square goodness-of-fit test was nonsignificant, $\chi^2 = 2.25$, $p = .52$. The goodness-of-fit index was 0.99 while the adjusted index was 0.97. The values were indicative of small errors of prediction. Similar evidence was provided by the sum of squared errors (.001). Moreover the variance explained by Model 2 was substantial, $R^2 = .40$. The causal model and obtained path coefficients are shown in Figure 2.

A variety of additional summary statistics are available for each test of the two models. The summary statistics are presented in Table 3.

TABLE 3
Goodness-of-fit and variance statistics for causal models.

	Model 1 Implicit	Model 1 Explicit	Model 2 Implicit	Model 2 Explicit
Chi-square	100.00	64.89	2.44	2.25
Degree of Freedom	3	3	3	3
Probability	.001	.001	.49	.52
Goodness-of-fit Index	.79	.83	.99	.99
Adjusted Goodness-of-fit Index	.29	.44	.97	.97
Root Mean Square Residual	.22	.17	.04	.04
Proportion of Sig. Deviations	.38	.25	.00	.00
Coefficient of Determination	.001	.012	.010	.032
Sum of Squared Errors	.44	.38	.001	.001
R-squared for Attitude	.04	.04	.48	.40

DISCUSSION

The primary objective of this research was to begin to explain why refutational two-sided messages are more persuasive than either nonrefutational two-sided messages or one-sided messages. In accomplishing that objective these data also afforded an opportunity to address an important secondary issue, i.e., replicating the meta-analytic findings reported by Allen (1991).

Type of Two-sided Message

These data replicate the meta-analytic findings of Allen (1991). As with the meta-analysis, the message sidedness-attitude correlation is significantly stronger for refutational two-sided messages than for nonrefutational two-sided messages. Moreover, the correlations between message sidedness and attitudes are within sampling error of the mean correlations in the meta-analysis for both types of two-sided appeals. These data, taken together with the meta-analysis, clearly indicate that refutational two-sided messages are superior to both one-sided messages and nonrefutational two-sided messages.

It is clear from this research, and from previous efforts, that the effect of message sidedness on persuasiveness is a weak one, most likely because the effect is indirect. Boster and Mongeau (1984) noted that the more intervening steps between the receipt of a message and the persuasiveness measure, the weaker the message effect will be. These data show that between the transmission of the message and the attitude

measure there are at least two intervening steps. With each successive step the sidedness-attitude correlation would be weakened.

Cognitive Processing of Messages

The primary goal of this study was to begin to understand why refutational two-sided messages are more persuasive than either nonrefutational two-sided messages or one-sided messages. Fulfilling this goal was a two-step process that involved fitting models to these data and then scrutinizing the model providing the best fit. These data suggest an order for the steps involved in cognitively processing persuasive messages. Based on the superior fit of Model 2 to these data it appears as though exposure to a message prompts the generation of cognitions, which produces an evaluation of the message, and that evaluation influences a recipient's attitude. It does not appear as though message recipients engage in a general evaluation before generating additional cognitions about the message.

When scrutinizing Model 2 it becomes clear that the number of positive cognitions generated is greater for refutational two-sided messages than for either nonrefutational two-sided messages or one-sided messages. In that way these data begin to offer an explanation for the "type of appeal" sidedness effects reported in recent literature (Allen, 1991: Allen et al., 1990). The issue of why this difference occurs is still partly unanswered.

One intuitively appealing possibility is that direct refutation of an opposing argument increases the perceived strength of the argument presented. Message recipients may have trouble comparing the arguments in a nonrefutational two-sided message and so perceive them to be weaker than when there is direct refutation. Arguments in one-sided messages may simply be perceived as being weaker than for refutational two-sided messages because mention of opposing arguments is missing. This explanation is consistent with the regularity of positive judgments and cognitions produced across sidedness conditions. There is considerable evidence demonstrating that perceived argument strength is positively related to the quantity of positive cognitions (e.g., Petty & Cacioppo, 1986).

If this explanation is accurate the difficulty of comparing arguments in a nonrefutational two-sided message might be moderated by individual difference variables. For example, persons with a high need for cognition, greater cognitive complexity, higher tolerance for ambiguity, or higher argumentativeness might generate a number of positive message cognitions despite having received a nonrefutational two-sided message. On the other hand, persons with a low need for cognition, low cognitive complexity, low tolerance for ambiguity, or low argumentativeness should have more trouble generating positive cognitions. Indeed, some research shows that the ability to engage in message

relevant thinking is influenced by such variables (e.g., Cacioppo, Petty, Kao, & Rodriguez, 1986).

This investigation was not intended to be a test of the elaboration likelihood model of persuasion (Petty & Cacioppo, 1986), but future sidedness research should explore the possibility that message sidedness functions as a central persuasive cue. These data indicated that sidedness influenced message elaboration, i.e., the generation of message relevant cognitions. Assuming the stimulus topic was even moderately involving to message recipients, the cognition data reported here are consistent with the notion that sidedness operated as a central cue. A complete test of this possibility might include experimental controls of involvement, argument strength, and message sidedness. If sidedness operates as a central cue, the results of such a study should be similar to these results in the high involvement condition and dissimilar in the low involvement condition of the research.

SUMMARY

In short, Allen's (1991) type of appeal hypothesis provided useful information regarding message choices in persuasive settings. Additional studies, including this one, have replicated his findings. The available studies each indicated that the source of a message is most persuasive when he/she uses a refutational two-sided message in lieu of either a nonrefutational two-sided message or a one-sided message.

This research identified a simple cognitive process to explain message sidedness effects. If the process is a robust one it should occur for other message effects. Such replications would be useful and could include both of the models tested here. This research also raised additional questions regarding message sidedness effects that ought to be probed, including whether individual differences and/or involvement moderate sidedness effects.

ENDNOTES

1. This model may be inferred from Petty and Cacioppo's work. We do not mean to imply that they would necessarily endorse the model.
2. Unidimensionality of each measure was tested using an ordinary least squares confirmatory factor analysis technique testing for internal consistency and parallelism.
3. These correlations are published elsewhere as a part of a replication of Allen's (1991) meta-analysis. The cognitive processing data have not been published elsewhere.

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