

# The effects of message repetitions on immediate and delayed attitude change

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In a 2 by 2 by 2 design, Ss received a persuasive message from either a high or low credibility source, heard the message either one or five times, and were tested as to immediate attitude and delayed attitude (4 weeks). Results indicate that message repetition facilitates the persistence of attitude change, particularly for that elicited by the high credibility source. An unexpected finding was higher message recall in the high than in the low credibility source treatment.

Johnson & Watkins (1970) tested the effects of the repetition of a persuasive message on attitude change by varying the level of difficulty of the message and by repeating the message either one, three, or five times. This research indicated that if the message is easily comprehended on the first presentation, additional presentations do not facilitate attitude change, although the additional repetitions do facilitate recall of the message. Repetition only facilitates attitude change when the message is not easily comprehended on the first presentation. The Ss in this experiment were retested 2½ months after the initial testing, and it was found that the initial attitude change had decayed considerably in all treatment groups and that there was no difference between the various repetition treatments. If it is assumed that the decay of initial attitude change is primarily a function of forgetting, then the results reported in Johnson & Watkins (1970) are contrary to the reliable finding of an inverse relationship between the degree of original learning and rate of forgetting.

One explanation for the failure of the repetition variable to influence the persistence of attitude change is that the 2½-month delay period was too long. Some past research (Kelman & Hovland, 1953; Watts & McGuire, 1964) has shown that the decay of immediate attitude change is fairly rapid over a period of 3 to 6 weeks, and the additional 4 to 6 weeks in the Johnson and Watkins study may have allowed the forgetting curves of each repetition treatment to reach a common asymptote. If this explanation is valid, then it is hypothesized that using a shorter delay period, i.e., 4 weeks, message repetition should facilitate the persistence of attitude change. The study presented in this paper seeks to test this hypothesis using a 2 by 2 by 2 factorial design with high or low credible source, one or five repetitions of the same persuasive message, and an immediate and delayed (4 week) measurement of attitude.

## SUBJECTS

The Ss were 76 introductory psychology students at Loyola University who received laboratory credit for their participation. They were tested in groups of three to six persons each. There were 19 Ss in each of the four treatment categories. The materials were similar to those used in previous research in this series, and a more explicit description can be found in Johnson & Scileppi (1969).

## PROCEDURE

After reporting to the laboratory, the Ss were told that they would be asked to listen to a tape-recorded communication made by a specific person and then would be asked their opinions about it. The E then read a 120-word biographical statement about the source of the message. One of the biographical statements described the source as a medical authority who was recognized as an expert in the field of tuberculosis and X-rays. The other statement described the source as a medical quack who had served a prison term for fraud. The statement was then read a second time.

The E then turned on the tape recorder, and the Ss heard a 350-word communication arguing against the use of chest X-rays for the detection of TB. The message presented rather plausible evidence concerning the danger of radiation as well as pointing out the availability of a safer technique (the skin test). This target issue was used because Ss are generally highly favorable to the use of the chest X-ray. For half of the Ss the message was presented once, and for half of the Ss the message was repeated five times with a 20-sec delay between repetitions.

After listening to the tape, the Ss were given a test booklet, the first page of which consisted of several questions related to the target issue. Two statements on this questionnaire were used as the attitude measure. These statements were: "Chest X-ray examinations for TB should be taken regularly and often" and "Everyone should get a chest X-ray each year in order to detect any possible TB

(tuberculosis) symptoms at an early state;" the S indicated his degree of agreement with each of the statements on a 15-point bipolar scale. Next, the Ss were given a second and similar questionnaire and were asked to fill it out as they thought the source would fill it out. Ss then answered a questionnaire designed to assess their recall of the communication. This questionnaire consisted of sentences taken from the message. Parts of the sentences were omitted, and the Ss had to fill in the missing words or phrases. There were 20 such words or phrases that had to be recalled. Lastly, the Ss responded to a questionnaire designed to assess their impressions of the source's credibility on the topic. This was a 9-position scale ranging from "I would consider him completely incompetent to render an opinion on this topic" to "I would accept his judgment on this matter without question."

Four weeks after the initial testing session the Ss were retested on the target issue. In order to avoid associating this delayed measurement with the initial session, Ss were tested during their regular classroom period, they were tested by a different E, the testing took place as part of a periodic survey made by the psychology department in which all class members filled out the questionnaires, and the two questions used as the dependent variable were imbedded within a 50-item attitude survey covering a variety of topics.

## RESULTS

The dependent variable of concern was the S's posttreatment attitude on the target issue. This was measured on the two 15-point bipolar scales. The possible range of scores is 2-30, with a low score indicating more agreement with the communication. Table 1 reports the mean posttreatment attitude scores. A 2 (high and low source) by 2 (one and five repetitions) by 2 (immediate and delayed attitude) analysis of variance with repeated measures on the last factor was performed on these means.

The results of the ANOVA indicated a significant effect of source ( $F = 42.79$ ,  $df = 1/72$ ,  $p < .001$ ), indicating more agreement with the message in the high source condition than the low source condition, and a significant effect of trials ( $F = 9.15$ ,  $df = 1/76$ ,  $p < .005$ ), indicating more agreement with the message on the immediate than on the delayed measure. The main effect of repetition and the Repetition by Source interaction was not significant ( $F < 1$ ). All interaction effects that had trials as a component were significant at least beyond .05, and these effects were further analyzed with Duncan's multiple range test: (1) The Trial by

Table 1  
Mean Attitude and Recall Scores as a Function of Source and Repetition Conditions

	Immediate Attitude <sup>a</sup>	Delayed Attitude <sup>ab</sup>	Source Evaluation	Message Recall	Perceived Message Position
High Credible Source					
One Repetition	6.84	15.47	6.68	76.68%	3.52
Five Repetitions	9.06	10.16	6.73	86.47%	3.58
Low Credible Source					
One Repetition	17.52	18.05	3.73	70.16%	2.84
Five Repetitions	18.15	18.68	3.16	78.32%	3.05

<sup>a</sup>The lower the score, the more agreement with the persuasive message.

<sup>b</sup>No treatment control group mean = 24.74.

Source interaction indicated greater decay in agreement with the message in the high credible source condition than in the low source condition. For the high source condition there is significantly less agreement ( $p < .001$ ) for the delayed measure than for the immediate measure, whereas no statistically significant loss of agreement occurred in the low source treatment; (2) the Trials by Repetition interaction indicates less agreement with the message from the immediate to delayed measure for the one-repetition treatment ( $p < .005$ ) but not for the five-repetition treatment; (3) in the Trials by Repetition by Source interaction, no significant differences were found between the four means associated with the low source condition (Table 1). For the high source condition there is a significant decrease in agreement with the message across trials for the one-repetition treatment ( $p < .001$ ) but not for the five-repetition treatment. Furthermore, no significant differences occurred between the one- and the five-repetition conditions for the immediate measure; however, the one-repetition condition indicated significantly less agreement than the five-repetition condition ( $p < .005$ ) on the delayed measure.

As part of the delayed test of attitude, all members of the regular classes were given the questionnaires. To provide a no-treatment control group, the responses of 38 randomly selected students were used. The mean attitude score for this group was 24.74. This mean was then added to the treatment means for the delayed measure, an analysis of variance was performed on the five means, and comparison between means were made using the Duncan test. The results indicate that there was significantly less agreement with the message for the control group than for any of the treatment groups. All significance levels were beyond the .001 level.

Evaluation of source credibility was made on a 9-point bipolar scale, with the higher score indicating a more

favorable evaluation. A 2 by 2 analysis of variance performed on the means reported in Table 1 indicated a significant effect due to the source manipulation ( $F = 99.37$ ,  $df = 1,72$ ,  $p < .001$ ). The main effect of repetition and the Source by Repetition interaction yielded F ratios of less than one.

The scoring of message recall was according to a standardized procedure used in past research in this series. A phrase or word was considered correct if it was recalled exactly as stated in the message or if it approximated the actual phrase. A 2 by 2 analysis of variance performed on the means reported in Table 1 indicated greater recall for the high source treatment than for the low source treatment ( $F = 4.52$ ,  $df = 1,72$ ,  $p < .05$ ) and greater recall in the five-repetition condition than in the one-repetition treatment ( $F = 6.75$ ,  $df = 1,72$ ,  $p < .025$ ). The Source by Repetition interaction yielded an F ratio of less than one.

As an indicant as to whether the Ss were accurate in determining what position was being advocated in the message, they were asked to check the attitude questionnaire as they thought the source would check it. The means for this variable are presented in Table 1. An analysis of variance performed on these data yielded F ratios of less than one for all sources of variance.

#### DISCUSSION

The finding that message repetition did not influence agreement with the message when the attitude measure was taken immediately after the message presentation replicates the finding of Johnson & Watkins (1970). These authors have suggested the presence of a scanning device having a set of preprogrammed judgmental criteria for the acceptance or rejection of new information. The repetition of an easily understood message should have little effect on the acceptance of such information because both the preprogrammed criteria and the information input have remained the same, and, therefore, one always gets

the same outcome decision. The input of such information may alter the judgmental criteria used for the evaluation of other information inputs, but it does not alter the judgmental criteria used to evaluate itself.

The effectiveness of message repetition seems to be in maintaining the initial levels of agreement with the message over time. It is assumed that this effect is due to an inverse relationship between the strength of the original learning of the message and the rate of forgetting, with repetition positively influencing the strength of original learning and thus slowing the rate of forgetting. The greater decay in message agreement in the high Source 1 repetition than in the low Source 1 repetition is consistent with past research (e.g., Watts & McGuire, 1964). The forgetting of the message probably progresses at the same rate (a negatively accelerating curve?) for both high and low source conditions. However, the fact that the high source elicited considerably more initial attitude change than the low source would seemingly necessitate that, given equal amounts of forgetting, more attitude decay towards the pretreatment attitude would occur in the high than in the low source treatment. Message repetition did not facilitate persistence in the low source condition. Presumably the rate of attitude change decay is so slow in this condition (because of the low amounts of initial attitude change) that the additional effects of the repetition variable are of little consequence.

An unexpected finding of this study is the better recall of the contents of the message in the high source condition than in the low source condition. This counters previous findings of no recall differences between sources (Johnson, Torcivia, & Poprick, 1968; Johnson & Scileppi, 1969). It also runs counter to the "lazy organism" hypothesis (McGuire, 1969), which suggests that no recall differences should be found between clearly valenced sources, but there should be more high recall to unclearly valenced sources than valenced sources. It is in the latter condition that the S is forced to absorb the contents of the material in order to decide on its validity. The previous research in this series has used written messages, whereas the study presented here used a tape-recorded message. Why (or if) the different modes of presentation influence recall as a function of source seems to be an interesting question; however, any answer at present would be highly speculative.

REFERENCES

- JOHNSON, H. H., & SCILEPPI, J. A. Effects of ego-involvement conditions on attitude change to high and low credibility communicators. *Journal of Personality & Social Psychology*, 1969, 13, 31-36.
- JOHNSON, H. H., TORCIVIA, J. M., & POPRICK, M. A. Effects of source credibility on the relationship between authoritarianism and attitude change. *Journal of Personality & Social Psychology*, 1968, 9, 179-183.
- JOHNSON, H. H., & WATKINS, T. A. The effects of message repetition on attitude change. Paper presented at the meeting of the Midwestern Psychological Association, Cincinnati, Ohio, May 1970.
- KELMAN, H. C., & HOVLAND, C. I. "Reinstatement" of the communicator in delayed measurement of opinion change. *Journal of Abnormal & Social Psychology*, 1953, 48, 327-335.
- McGUIRE, W. J. The nature of attitudes and attitude change. In G. Lindzey and E. Aronson (Eds.), *The handbook of social psychology*. Vol. III. Reading, Mass.: Addison-Wesley, 1969. Pp. 136-314.
- WATTS, W. A., & McGUIRE, W. J. Persistence of induced opinion change and retention of inducing message content. *Journal of Abnormal & Social Psychology*. 1964, 68, 233-241.
- In the context of A and B, it is hypothesized that different associations would be elicited.

SUBJECTS

The Ss were 70 introductory psychology students at the University of Nebraska. Participation in experiments was required of all introductory students, but they were free to select the particular experiments in which they participated. Ss were run in three groups of 13, 27, and 30 Ss each.

PROCEDURE

Since Willner (1964) found the analogy problems of the type used in the Miller Analogies Test to be among those least soluble through word association, it was decided to select 25 problems from the Miller Analogies Practice Tests provided by Friedberg (1967). Seven different tests were constructed from these problems. First, the control group received an analogy test composed of the 25 problems. Six other tests were constructed using the same D choices that the control group received; however, each test had a different combination of the A, B, and C parts. Group A received a test booklet containing only the A parts with instructions to choose a word from the list of four alternatives accompanying each item to go with the first word. Groups B and C received similar booklets and instructions except that the items contained only the B and C parts, respectively. Group ABC received all three of the analogy parts, as well as the D choices, but with the word association instructions. All external clues identifying these as analogy problems were removed. Group ABC received the three A, B, and C parts in their original order; Groups BCA and CAB were given test booklets identical to those given to Group ACB except that the parts occurred in different orders (i.e., according to the order indicated by their symbols). The test booklets were shuffled and handed to Ss as they entered the experimental testing room. Written instructions accompanied each booklet, and the only oral instructions offered were comments on information to be included on the IBM answer sheets. After S completed and turned in his test booklet, he was given a postexperimental questionnaire asking him for his impressions of the experiment and how he chose his answers. The entire procedure took from 10 to 25 min.

RESULTS

Answers were scored in terms of whether or not they correctly completed the analogy problems. One question was discovered to contain a typographical error and had to be discarded in the scoring, leaving a total

## Word association and verbal analogy problems

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Previous attempts to identify verbal analogy problems that can be solved on the basis of word association did not take account of the possibility that associations to a word are different when that word is in the context of other words than when it is presented alone. The various parts of 25 verbal analogy problems were presented, individually and in combinations, to Ss with instructions to choose responses on the basis of word associations. Ss receiving all three of the stimulus parts of the analogy problems chose answers that completed the corresponding problems significantly more often than Ss given only one of the stimulus parts. This result, and other factors, led to the conclusion that it is not possible to eliminate totally the word association bias of verbal analogy problems.

In spite of the considered importance of analogical reasoning in the measurement of intelligence (Willner, 1964) and in the construction of scientific explanations (Dreistadt, 1968, 1969; Oppenheimer, 1956), there is very little empirical data on analogical reasoning as a psychological process. This deficit can be attributed to (1) the lack of an adequate theoretical conception of the process and (2) inadequate experimental tasks in which to investigate the relevant variables.

It is possible to view analogical reasoning in terms of rule construction and utilization. Analogies have the general form, A is to B as C is to D, where the various parts of the analogy can be virtually anything. When presented as a problem-solving task, Part D is some particular item which S must either supply or select from among a list of similar items. According to a "Rule Model" of analogical reasoning, S finds or constructs a rule which connects the attributes of A to the attributes of B and then applies this rule to the attributes of C in order to generate D. When the analogy problem is presented in a multiple-choice format, S identifies the correct answer by comparing the attributes generated by

the application of the rule to C against the attributes of various alternatives provided. This model is consistent with previous proposals for describing analogical reasoning (Dreistadt, 1968; Goldstein, 1962; Willner, 1964) and is closely related to recent models of human conceptual behavior (Haygood & Bourne, 1965).

Although an effort has been made to devise appropriate tasks, the lack of adequate experimental materials is more difficult to remedy. For example, some analogy problems can be solved without knowledge and/or application of the "Rule Model" simply because parts C and D have a high association value. Goldstein (1962) and Willner (1964) constructed verbal analogy problems in which the biasing influence of word association was reduced by eliminating items in which Part C had a strong tendency to evoke Part D, regardless of Parts A and B and the rule connecting their attributes. In both studies only Part C was presented as the word association stimulus. However, as Woodworth & Schlosberg (1954) and Cofer (1957) report, the associations to a word vary in relation to the context in which it appears. Thus, if Part C were to appear