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REPETITION, ORDER OF PRESENTATION, AND TIMING OF ARGUMENTS AND MEASURES AS DETERMINANTS OF OPINION CHANGE [1]

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A model of order effects developed by Miller and Campbell (1959) predicts more recency with intervals between arguments and less recency with a delay of the posttest. To test the model, this study used 320 undergraduates as Ss, periods of 1 wk. as intervals and delays, and jury-trial excerpts as materials. Retention data supported the model completely. Opinion data showed less recency with delay ($p < .01$), as predicted, but did not show more recency with intervals—a striking nonconfirmation. Repeating an argument (1 vs. 3 times) increased opinion change slightly ($p < .05$) and retention markedly ($p < .01$). Both retention and opinion showed strong overall recency ($p < .01$).

Thirty years of research and theorizing have provided much data on the effect of order of presentation on the formation of impressions and opinions. The current literature, however, does not show a completely clear picture. McGuire (1966) has noted some inconsistency in the results and also the difficulty in accounting for these results within any one theoretical framework. Anderson (1965), Lana (1964), Rosnow (1966), and Rosnow, Holtz, and Levin (1966) have also reviewed the order-effect literature and noted that the issue has not as yet been completely clarified.

The purpose of the present study was to test a model of order effects developed by Miller and Campbell (1959) and based on the negatively accelerated forgetting curve proposed by Ebbinghaus. Miller and Campbell's article offered some support for their model as did a later article by Insko (1964). Miller and Campbell (1959) presented Figure 1 to illustrate their model.

In this diagram, the solid line (Line A) represents the contribution of a communication presented first, its strength decaying as time elapses. The two dashed lines (B and B′) represent the contributions of a second opposing communication. In one instance, this second communication is presented immediately after the first (Line B); in the other instance, one week after the first (Line B′). Net effects of the two communications in combination are reflected by the vertical distance between Line A and Line B or B′ at any given point in time. The numbered vertical slicings in the diagram represent four possible schedulings of a measure of net effects, designated as Conditions 1-4. Five predictions emerge, stated in terms of the relative magnitude of the recency effect, i.e., the dominance of the second communication in the composite under the four conditions: $3 > 4$, $3 > 1$, $3 > 2$, $1 > 2$, and $4 > 2$ [Miller & Campbell, 1959, p. 2].

The $1 > 2$ and $3 > 4$ predictions imply that recency trends should be stronger when-

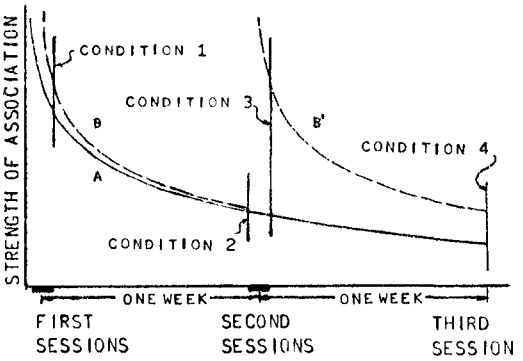

FIG. 1. Hypothetical forgetting curves for a first and a second competing persuasive communication when both are presented during a single session (Curves A and B) or when the two are presented 1 week apart (Curves A and B′). (The four conditions, appearing as vertical slicings, represent the timing of measurements. After Miller & Campbell, 1959.)

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ever the posttest is not delayed, while the 3 > 1 and 4 > 2 predictions imply that recency trends should be stronger when an interval occurs between the two messages. It may be noted, however, that Figure 1 shows only relatively small differences between 1 and 2 and between 4 and 2. Nonconfirmation of the 1 > 2 and 4 > 2 predictions would not seem to embarrass the model greatly. The most emphatic prediction would seem to be simply that Condition 3 (the no-delay–interval condition) should show a stronger recency effect than any other condition.

The Miller-Campbell model calls for manipulation of time (a variable known to be related to retention) to see if passage of time is related to opinion change. The present study added, also, a manipulation of frequency of presentation (another variable known to be related to retention) to see if frequency of presentation would affect opinion change.

METHOD

Design and Procedure

The present study employed an analysis of variance design to determine the effects of five different variables on opinion and retention: Replication 1 versus Replication 2, one repetition versus three repetitions of an argument, order of presentation, a 1-week interval versus no interval between the first and second arguments, and a 1-week delay versus no delay between the last speech and the act of decision making.

All the subjects in a given cell were assembled in the same classroom and seated one seat apart. All of the subjects completed their opinion ratings first. The retention test appeared half of the time in the defense-prosecution order and half of the time in the prosecution-defense order. Each group was measured only once in a posttest-only design as defined by Campbell (1957). The no-interval–no-delay session required about 50 minutes. In the no-delay conditions, the testing began immediately after the second communication. Some subjects, those in the interval and/or delay conditions, had to return a second or third time. Two experimental sessions, one from each replication, occurred simultaneously in separate rooms under the direction of two different experimenters. All sessions began at 12, 1, 2, or 3 o'clock on Monday, Tuesday, Wednesday, or Thursday of the same week, the two replications being spread over the various days of the week and hours of the day in a randomized pattern, with the restriction that the groups run at any given time never filled corresponding cells in their respective replications.

The two different replications provided some estimate of the strength of supposedly irrelevant factors such as hour of the day, day of the week, and personal characteristics of the experimenter. If these factors do exert effects, they must become apparent as main effects of replications or as interactions between the replication variable and the other variables. Since the present design did allow the influence of extraneous factors to become apparent, it seems superior to the common practice, followed by Miller and Campbell (1959) and Insko (1964), of running all the subjects in one cell at one time and merely assuming that the uncontrolled factors are irrelevant.

Subjects

Random discarding reduced the number of subjects to 10 in each of 32 cells. All the subjects came from classes in general or introductory psychology.

Communications

Excerpts from the same recordings used by Miller and Campbell (1959) served as the experimental communications in this study.[2] The trial involved a suit for damages caused by an allegedly defective vaporizer. Miller and Campbell (1959) used practically all of the prosecution and defense arguments, which they arranged in separate blocks. Each block lasted approximately 45 minutes. The present study used only excerpts from the opening and closing speeches of each attorney, each block lasting approximately 7 minutes. Pilot studies showed that each argument was highly effective in swaying opinion in its direction.

Response Measures

The subjects marked two graphic 9-point rating scales to express the degree to which they thought either the plaintiff or the defendant was responsible for the accident. One scale asked for an estimate of the amount of money that should be awarded to the plaintiff. These two scales proved to be very highly correlated, and, in the end, they were summed to produce the response measure actually used. If the ratings were higher in the defense-prosecution order, a recency effect was demonstrated. If the ratings were higher when the prosecution argument was repeated, a main effect of repetition was present.

The retention test for the defense argument consisted of 11 fill-in-the-blank items, 12 multiple-choice items, and 7 true-false items; the retention test for the prosecution argument was similar. The retention measure of most interest is the relative retention of the two arguments, as determined by subtracting the error score on the prosecution test from

[2] Miller and Campbell (1959) expressed their indebtedness to Fred L. Strodtbeck of the University of Chicago who originally recorded the jury trials and made them available. The present authors are glad to express their thanks to Miller and Campbell for the use of their recordings.

the error score on the defense test. The balanced design allows the other variables to impinge systematically on the size of this difference, just as they impinge on the magnitude of the opinion ratings. The reliability of the relative retention measure was determined by correlating the relative retention of the odd versus the even items and applying the Spearman-Brown prophecy formula.

RESULTS

Total Retention

The data on total retention have no direct relevance to the decay curve analysis since it makes predictions only about relative retention. One result worthy of note was substantially better retention by the subjects of one replication. The means were 25 versus 21, and the related F ratio was a sizable 36 ($df = 1/288$, $p < .01$). This difference in the amounts learned in the two replications was most likely due to some difference in the two experimenters. The experimenter in charge of the low-scoring replication was a female graduate research assistant, while the experimenter in charge of the high-scoring replication was a male assistant professor, the senior author. The sex and/or status differences between the experimenters might possibly account for the differential learning of their subjects. The relative retention and opinion data generally showed an impressive consistency between replications despite the difference in the amount of learning attained in the two. The strong replications main effect, however, cautions against the careless assumption that variables are unimportant merely because they seem so.

TABLE 1

MEANS SHOWING DEFENSE ERRORS MINUS PROSECUTION ERRORS IN ALL CONDITIONS AND IN INTERVAL × DELAY CONDITIONS

	No interval		Interval	
	No delay	Delay	No delay	Delay
Defense-prosecution order				
Defense repeated				
Replication 1	5	3	4	−2
Replication 2	3	2	4	2
Prosecution repeated				
Replication 1	13	9	12	10
Replication 2	10	9	11	7
Prosecution-defense order				
Defense repeated				
Replication 1	0	1	−5	−2
Replication 2	1	0	−3	0
Prosecution repeated				
Replication 1	9	9	8	6
Replication 2	7	9	2	7
Net recency effect	14	4	29	6

TABLE 2

ANALYSIS OF VARIANCE SHOWING THE EFFECT OF REPLICATION, REPETITION, PRIMACY-RECENCY, INTERVAL, AND DELAY ON RELATIVE RETENTION AND OPINION

Source	*df*	*F*	*F*
		Relative retention	Opinion
Replication (Rep)	1	1.41	.19
Repetition (R)	1	305.88*	5.31*
Order (O)	1	56.00**	22.69*
Interval (I)	1	15.71**	.00
Delay (D)	1	1.82	1.62
Rep × R	1	7.53**	—
R × D	1	—	4.12*
O × I	1	5.94*	.06
O × D	1	19.82**	17.94**
O × I × D	1	4.24**	.25
Within (error)	288	17	16

Note.—All significant interactions are listed.
* $p < .05$.
** $p < .01$.

Relative Retention

Relative retention as a function of the various treatments is indicated in Tables 1 and 2. Dramatic theoretical confirmation was provided by these data. The predicted effects show up clearly in the last row of Table 1, which, when read from left to right, corresponds to Conditions 1–4 in the Miller-Campbell figure. Recency was greater in interval versus no-interval conditions (29 versus 14, 6 versus 4), and recency was less in delay versus no-delay conditions (4 versus 14, 6 versus 29). These facts are reflected in the analysis of variance by significant interactions between order and interval and between order and delay.

As suggested earlier, the strongest prediction of the model would seem to be one of relatively more recency in Condition 3 than anywhere else. This expectation certainly found confirmation here since the recency effect in Condition 3 (29) far exceeded the next largest recency effect (14). This fact is reflected in the analysis of variance by the

significant second-order interaction involving order, interval, and delay.

The retention data showed a net recency effect in all four conditions, and overall the order main effect is highly significant.

Not surprisingly, the subjects remembered the repeated argument far better than the unrepeated one.

Certain artifactual effects also occurred in the relative retention data. One of these was a significant interaction between replications and repetition. This interaction seems to be due to the fact that repetition improved retention relatively more in the high-scoring replication.

The interval main effect shown in Table 2 seems to occur mainly because the error scores ran higher on the defense test than on the prosecution test. The relative retention score was based upon the number of defense errors minus the number of prosecution errors. Except for the unexpected difference in difficulty, it would have made little difference which test came before the interval. As it was, however, error scores on the hard defense test could not get much higher when defense was before the interval, but error scores did have room to increase when the relatively easier prosecution test came before the interval. As a result, the relative number of prosecution errors was greater in the interval condition.

TABLE 3

MEAN OPINION RATINGS UNDER ALL CONDITIONS AND IN INTERVAL × DELAY CONDITIONS

	No interval		Interval	
	No delay	Delay	No delay	Delay
Defense-prosecution order				
Defense repeated				
Replication 1	12	10	11	10
Replication 2	14	7	13	10
Prosecution repeated				
Replication 1	14	11	14	12
Replication 2	12	12	13	10
Prosecution-defense order				
Defense repeated				
Replication 1	9	10	8	7
Replication 2	9	10	9	9
Prosecution repeated				
Replication 1	8	10	9	11
Replication 2	9	10	9	13
Net recency effect	17	0+	16	2

TABLE 4

ORDER EFFECTS IN OPINION AND RETENTION IN THREE STUDIES

Source	Condition			
	No interval		Interval	
	No delay	Delay	No delay	Delay
	1	2	3	4
Miller & Campbell (1959)				
Opinion	.06	−2.11	1.67	−.11
Retention	.33	.39	5.65	1.89
Insko (1964)				
Opinion	−.60	.39	1.44	.43
Retention	.72	.74	7.92	−1.44
Present study				
Opinion	17	0+	16	2
Retention	14	4	29	6

It may be noted that this lack of responsiveness on the part of the defense test would tend to attenuate the magnitude of the Interval × Order interaction which was, nonetheless, confirmed.

Opinion

The opinion data also indicated a number of significant trends; however, the dramatic confirmation of theory was no longer present. The effect of the several independent variables on opinion is indicated by Tables 2 and 3.

Table 2 shows that repetition, which represents the unique aspect of the present study, was associated with a technically significant main effect ($p < .05$), the repeated argument being slightly more persuasive. Repetition also interacted with delay, however, having more effect when a delay occurred; and, in fact, repetition apparently exerted no effect at all when there was no delay. Apparently repetition exerted its effect not because the repeated argument had a greater persuasive impact, but only because its impact decayed less rapidly than that of the nonrepeated argument.

Smaller recency effects occurred in delay versus no-delay conditions as the model would predict. This effect was very strong (17 versus 0+, 16 versus 2) and is reflected in the analysis of variance by the significant interaction between order and delay.

The opinion data did not confirm the other implications of the model. Recency trends were not appreciably stronger in the interval conditions than they were in the corresponding no-interval conditions (16 versus 17, 2 versus 0+). Condition 3 showed a large recency effect (16), but it was actually slightly smaller than the recency effect in Condition 1 (17). This last result is a striking nonconfirmation of the model because, as noted earlier, the strongest single implication of the model would seem to be that Condition 3 should show a larger recency effect than any other condition. These negative results are reflected in the analysis of variance by the nonsignificance of the Order × Interval and the Order × Interval × Delay interactions.

Correlation between Opinion and Retention

To obtain still another indication of the possible relation between opinion and retention, the retention and opinion measures were correlated. The reliability of the relative retention score was .85, while the overall correlation between opinion and retention was .28. Correlations computed within the four possible combinations of interval and delay did not differ significantly from each other. The correlational analysis agrees with the other data in suggesting that learning considerations account for some, but only a modest proportion, of the variance found in opinion measures.

Cross-Experimental Comparisons

Table 4 presents a summary of the results of the present study and of the other two studies that are directly pertinent to the Miller-Campbell model, Columns 1 through 4 in this Table corresponding to Conditions 1 through 4 illustrated in the figure prepared by Miller and Campbell (see Figure 1). If, as has been suggested, one looks for a relatively predominant recency effect in Condition 3 as the most emphatically predicted effect, it may be noted that the retention data of all three studies did confirm this prediction. The opinion data of the Miller and Campbell (1959) and Insko (1964) studies were also confirmatory. The opinion data of the present study, however, completely failed to confirm this very strong prediction since the present study showed a recency effect in Condition 1 which was almost exactly as strong as the one in Condition 3.

Overall, the data clearly favor recency trends. Table 4 shows that the retention data indicated recency 11 times out of 12, while the opinion data showed recency 9 times out of 12.

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