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Performance consequences of encoding belief-incongruent editorials

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PERFORMANCE CONSEQUENCES OF ENCODING BELIEF-INCONGRUENT EDITORIALS

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Abstract

Performance and message consequences of encoding belief-incongruent editorials were examined in this study. Twenty-six students enrolled in News Editing completed a student opinion survey, containing scales for both direction and intensity of belief. Approximately two weeks later they were asked to write editorials on two propositions determined to be strongly-held beliefs. Each subject was required to write one editorial congruent with personal belief and one belief-incongruent editorial. Subjects were assigned at random so that 14 did the belief-congruent encoding first and 12 did the belief-incongruent encoding first. The research hypotheses--that when encoding belief-incongruent editorials subjects would make more spelling and punctuation errors, take longer to write, produce fewer words per minute, and write less readable messages than when encoding belief-congruent editorials--were rejected. However, time, rate, and readability for the second editorial improved significantly over the first editorial. These results suggest that students' writing apprehension decreases and performance improves from a first to a second encoding, regardless of whether they are writing belief-congruent or belief-incongruent editorials. The author suggests a need to incorporate order effect as a variable into future studies of belief-congruent vs. belief-incongruent message encoding.

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Introduction

In the mass communication model of Westley and MacLean (1957), gatekeepers are those communicators who mediate between society and the environment; they gather news (information about events in the environment) for dissemination to members of society. While serving to extend the environment for receivers of the communication, at the same time they limit and define the information that is transmitted.

In his classic study of a wire copy editor's gatekeeping function, White (1950) called reporters the first gate in the gatekeeping process. Assuming that a society requires not merely information, but accurate, undistorted information, it is important to ask just how well reporters serve that need. Surprisingly, a survey of related literature shows that the question is seldom asked. While the question can be researched on several levels, one need is for inquiry into the basic question of what influences the intrapersonal input-output processes of gatekeepers. The following hypothetical case will illustrate the problem:

A reporter whose retarded child lives in an institution is assigned to interview a nationally prominent authority on mental retardation. This authority is opposed to institutions and favors establishment of community services. He tells the reporter that in his opinion parents who do not want to accept responsibility for providing a loving home for their retarded children should have their parental rights terminated. Will the reporter's message-

encoding behavior and resulting story be affected by having to write about beliefs contradictory to his own?

Survey of related literature

The need for investigation into how personal beliefs (and other variables) may influence message accuracy is demonstrated by empirical data from questionnaires sent to news sources which show inaccuracy and distortion to be problems of considerable magnitude. The originator of such studies found factual or typographical errors in two-thirds of the news stories examined (Charnley, 1936). That accuracy is largely dependent on the reporter's intrapersonal information processing is suggested by the findings of Morris (1973): 75 per cent of the reporters he questioned opposed using tape recorders, relying instead on memory and note-taking ability.

Flegel and Chaffee (1971) conjectured that reporters must frequently write stories incongruent with their own beliefs. They noted that most newspapers support conservative policies and candidates while their reporting staffs are often predominantly liberal.

Clearly there is a need for more research into the relationship between a writer's beliefs and message accuracy. This study examined one aspect of the relationship, specifically the effects of cognitive incongruency on the written message encoding behaviors of students. It was hypothesized that when subjects must encode a message incongruent with their beliefs, they

would make more spelling and punctuation errors, take longer to write the message, and write less readable messages than when encoding a belief-congruent message.

While there have been many studies of accuracy, the quest to determine causes of inaccuracies has not been vigorous. Among researchers who examined the relationship between reporters' beliefs and bias or inaccuracy was Breed (1955), who found that a reporter's personal aspirations and allegiances influenced performance. Gieber (1959) found that influences such as newspaper policy and work pressures prevented reporters who wrote civil rights stories from fully exploring events they reported.

That the relationship between perceived beliefs and writing news stories is highly complex was demonstrated by Kerrick, Anderson and Swales (1964). They found that students who most disagreed with a stated editorial policy wrote the most partisan stories and editorials in favor of that policy. Also included in this study was a group of students who wrote news stories without receiving any information about news policy. These students, writing from a "fact sheet" that contained balanced statements about labor and management, tended to select statements consistent with their own beliefs. Of course, that does not tell us if working reporters function in the same way. That question was dealt with by Flegel and Chaffee (1971), who concluded that reporters were more influenced by their own personal opinions than by what they perceived to be the views of editors and readers.

Other researchers have linked message distortion to distortion of memory, images of reference groups or persons, lack of preparation, and reporters' expectations. Following five-minute interviews, Payne (1949-1950) found memory faults in experienced interviewers. Zimmerman and Bauer (1956) found that journalism students were more likely to remember material they believed to be congruent rather than incongruent with beliefs of an anticipated audience. In a study of the effects of reference persons on reporters, Pool and Shulman (1959) found the stories were more accurate if good news elicited images of supportive persons, and bad news, images of critics. Lawrence and Grey (1969) found that insufficient background was the main cause of many subjective inaccuracies. There is some literature in the area of survey interviews; a notable study here is one by Smith and Hyman (1950), who found that an interviewer's expectations have a greater biasing effect than do his own ideological preferences.

Performance and message consequences of belief-incongruent encoding. The present study is derived from research by Greenberg (1961), who examined the influence of communicator beliefs on certain performance and message variables. Greenberg found that journalism students writing from an assignment incongruent with their beliefs took longer to write, made more grammatical, spelling, and punctuation errors, performed more editing, and encoded less readable messages than students writing neutral and consonant assignments. Greenberg attributed the results to "cognitive stress."

The informal observations of a well-known advice columnist tend to confirm some of Greenberg's findings. Ann Landers stated that in 22 years of reading letters from people who need help she has learned to tell the authentic from the fake because people writing in anguish often misspell words, write in the margins, and add last minute thoughts.

Greenberg and Tannenbaum (1962) cited previous psychological research which indicated that cognitive stress influences the individual's normal pattern of behavior, usually resulting in lowered efficiency. When an individual's cognitions (i.e., valued beliefs, perceptions, and attitudes) are exposed to threat, cognitive stress results, affecting the beliefs themselves and the balance within the individual's belief system. They theorized that such disturbances predispose an individual to deviate from normal behavior on a given task. If this hypothesis is valid, then cognitive stress induced in the communicator through a threat to some personal beliefs should influence that person's encoding function. The consequences should be apparent in the encoding behavior itself and in the message produced (pp. 169-170). However, to date no one has presented any further test of this hypothesis.

Research problem

The general problem investigated was: "Does the encoding of a belief-incongruent editorial affect efficiency in the production of a written message?" The problem was explored by seeking answers to the following question: Do students encoding belief-incongruent

editorials make more spelling and punctuation errors, take longer to write, produce fewer words per minute, and write less readable messages than when encoding belief-congruent editorials?

Hypotheses

H 1 When encoding a message incongruent with their beliefs, students will write less skillfully than when encoding a belief-congruent message.

H1.1 When encoding a message incongruent with their beliefs, students will make more spelling errors than when encoding a belief-congruent message.

H 1.2 When encoding a message incongruent with their beliefs, students will make more punctuation errors than when encoding a belief-congruent message.

H 1.3 When encoding a message incongruent with their beliefs, students will take longer to write messages than when encoding a belief-congruent message.

H 1.4 When encoding a message incongruent with their beliefs, students will produce fewer words per minute than when encoding a belief-congruent message.

H 1.5 When encoding a message incongruent with their beliefs, students will write less readable messages than when encoding a belief-congruent message.

H 2 When a student must write both an incongruent and a congruent message, the order in which they are written will have no significant relationship to writing performance.

Definition of terms

Belief-congruent encoding: Students wrote editorials in favor of a topic that agreed with their strongly-held beliefs. From a list of 25 propositions about which the students indicated the direction (D) and intensity (I) of their beliefs, each individual was assigned to write an editorial supporting the proposition given the highest positive score (D x I). (See Appendix I.)

Belief-incongruent encoding: Students wrote editorials in favor of a topic that contradicted their strongly held beliefs. From a list of 25 propositions about which the students indicated the direction (D) and intensity (I) of their beliefs, each individual was assigned to write an editorial supporting the proposition given the most extremely negative score (D x I). (See Appendix I.)

Methods and Procedures

Research design

DEPENDENT VARIABLES	TREATMENT CONDITIONS			
	Group A (n=14)		Group B (n=12)	
	T_1	T_2	T_1	T_2
Spelling errors				
Punctuation errors				
Total encoding time				
Production rate				
Readability				

Group A; congruent treatment first
Group B; incongruent treatment first
Group AB: all subjects combined

The empirical hypotheses were tested by comparing all messages written in the belief-congruent treatments with all messages written in the belief-incongruent treatments for each dependent variable. To test the null hypothesis that the order in which messages are written will not affect the results significantly, all editorials written first (T_1) were compared with all editorials written second (T_2) for each dependent variable. Also, order effect was tested by comparing dependent variables within subgroups: congruent vs. incongruent messages in Group A (congruent treatment first) and congruent vs. incongruent messages in Group B (incongruent treatment first).

Dependent variables are of two main types: performance indices and message readability. Since previous research by Greenberg has shown that production efficiency decreases under belief-incongruent encoding conditions, it was expected that there would be a significant increase in encoding time and errors and a significant decrease in production rate and readability under conditions of belief-incongruent encoding over belief-congruent encoding.

The present study is a follow-up to the doctoral dissertation of Greenberg (1961). Some major dissimilarities should be noted. First, Greenberg compared three groups of students, each group assigned to a different treatment: stress-encoding, no-stress encoding, and consonant-encoding. He measured stress at the beginning of the experiment, after induction, and at the end of the encoding task. The present study examined an experimental group

of students under two conditions: belief-incongruent encoding and belief-congruent encoding.

Second, this study did not attempt to ascertain whether stress was induced in subjects. What really matters in the newsroom is the relationship between belief-incongruent encoding and the written messages. Greenberg included a number of dependent variables not under consideration in this study, which focuses on those performance and message variables of most importance in a newsroom setting. For example, the amount of editing, one of Greenberg's dependent variables, would not matter much in the newsroom where the finished product is what counts.

Another departure from Greenberg is in the encoding assignment. He attempted to induce stress by asking journalism students to write an evaluation of their journalism education after being exposed to a presumably real faculty committee report highly critical of the quality of journalism students and journalism education at the University of Wisconsin. In the present study subjects received individual editorial writing assignments, with the experimental comparison being created through assignments to write editorials supporting belief-congruent and belief-incongruent propositions.

Subjects

Subjects were 26 students enrolled in two sections of News Editing taught by Dr. Douglas Anderson at the University of Nebraska at Omaha. They were divided at random into two groups so that 14 did the belief-congruent encoding first and 12 did the belief-incongruent encoding first.

Materials

About two weeks prior to the experiment, the students' strongly-held beliefs were ascertained by administering an opinion survey based on Fishbein's measures of the belief and affect dimensions of attitude (Steiner & Fishbein, 1965). Fishbein's measures involve two semantic differential scales, one for belief and one for affect. Fishbein maintained that for any given concept category an individual has many beliefs that vary in intensity. To determine the total attitude, Fishbein sums the individual's scores on belief scales and multiplies them by the associated affect scores. This method would seem to be in keeping with the position taken by Sherif, Sherif, and Nebergall (1965), who stated that measuring attitudes requires indicators of a range of positions toward the object of the attitude and of a person's ego involvement with the issues.

Rather than using a cluster of beliefs, the researcher sought to determine students' attitudes by a single set of belief-affect scales for each of 25 propositions. A third requirement of Sherif, Sherif and Nebergall--that the test measure a person's attitudes rather than what she thinks the examiner or others consider socially acceptable--may not have been met, inasmuch as students were asked to sign the surveys. However, they were told that no one but the examiner would see the surveys and that their names would never be used in connection with the published results.

A pre-test of the opinion survey confirmed the examiner's expectation that each student would give very high or low ratings ($D \times I = \pm 15$ or more) to at least two of the 25 propositions. The pre-test also identified seven propositions ($D \times I = \pm 8$ or less) which were then replaced or revised.

The examiner asked subjects to take a "student opinion survey" on which they indicated the direction and intensity of their beliefs regarding 25 propositions (see Appendix I). From this "survey" the examiner developed individualized assignments for the editorial writing treatments. Congruency and incongruency of assigned topics were determined by multiplying Direction of Belief (D) times the Intensity of Belief (I) indicated by the student on a given proposition. The proposition given the highest positive score was chosen for the congruent writing assignment, whereas the proposition given the most extremely negative score was chosen for the incongruent writing assignment. The independent variable--congruency--was manipulated by assigning students to write one editorial in favor of a proposition congruent with their beliefs and one editorial in favor of a belief-incongruent proposition.

Procedures

Dr. Anderson and the examiner presented the editorial writing task to students as a combined classroom assignment and experiment. The professor told students he would grade them on the basis of their editing of the manuscripts rather than content. This was done because of the possible stress-inducing effect of a content

grade, a real possibility inasmuch as students had not previously written editorials and had not received instruction in editorial writing as part of the course in which they were enrolled.

The examiner told students the editorial writing assignments were developed from the opinion survey results and would be used in the examiner's research for her Master's thesis. She told them they would be writing favorable editorials on two propositions. She assured them that Dr. Anderson did not know, nor care, what their beliefs were, and that no one would see their editorials except Dr. Anderson and the examiner.

In response to students' questions, the examiner said they might find themselves writing in favor of something with which they disagree. They were instructed to turn in the first assignment as soon as they were finished, at which time they were given the second assignment, also to be turned in upon completion. Approximately 85 minutes of class time was allowed for the experiment.

The following week the examiner visited the classes to "debrief" students by telling them the purpose of her research.

Results and Discussion

Hypothesis 1, performance measures

Means for the congruent and incongruent writing treatments were compared for each dependent variable by the formula for "t" for small uncorrelated samples of unequal size contained in the SPSS V-6.00 program. Table 1 shows the means, standard deviations, and range by group for each variable and treatment. Group AB

represents all subjects (N=26); Group A (n=14) received the congruent treatment first while Group B (n=12) received the incongruent treatment first.

Table 1

Means, Standard Deviations, and Range on Each Dependent Variable by Group

Variable and Group	Means	Standard Deviations	Range: Minimum--		Maximum
Congruent, Spelling errors ÷ total words					
AB	.021	.016	.0	to	.061
A	.020	.016	.0	to	.055
B	.022	.016	.006	to	.061
Incongruent, Spelling errors ÷ total words					
AB	.017	.014	.0	to	.053
A	.015	.017	.0	to	.053
B	.019	.010	.0	to	.032
Congruent, Punctuation errors ÷ total words					
AB	.013	.012	.0	to	.047
A	.014	.014	.0	to	.047
B	.013	.011	.0	to	.028
Incongruent, Punctuation Errors ÷ total words					
AB	.010	.010	.0	to	.038
A	.009	.011	.0	to	.038
B	.011	.009	.0	to	.035
Congruent, Time in minutes					
AB	33.747	11.215	13.133	to	50.633
A	39.064	8.450	24.783	to	50.633
B	27.543	11.113	13.133	to	47.833
Incongruent, Time in minutes					
AB	31.559	9.620	15.233	to	54.533
A	27.704	7.875	15.233	to	44.367
B	36.057	9.800	16.333	to	54.533

Table 1 (continued)

Variable and Group	Means	Standard Deviations	Range Minimum --	Maximum
Congruent, Rate in words per minute				
AB	6.817	2.602	3.417 to	10.751
A	5.588	2.125	3.422 to	10.168
B	8.251	2.427	3.417 to	10.751
Incongruent, Rate in words per minute				
AB	6.612	2.044	3.582 to	12.580
A	6.507	1.538	3.741 to	10.245
B	6.735	2.583	3.582 to	12.580
Congruent, Readability by ITEST program				
AB	46.252	7.637	30.450 to	58.030
A	43.728	8.167	30.450 to	55.740
B	49.197	6.014	39.350 to	58.030
Incongruent, Readability by ITEST program				
AB	48.088	6.973	34.870 to	64.190
A	49.164	8.748	34.870 to	64.190
B	46.832	4.109	41.600 to	55.230

AB=All subjects (N=26)

A=Congruent treatment first=14
B=Incongruent treatment first=12

None of the research hypotheses predicting that writing a message incongruent with personal beliefs would lead to less skillful writing than writing a message congruent with personal beliefs was accepted. For all dependent variables, data from the two subgroups was combined for each encoding condition. Means and "t" values appear in Table 2.

Table 2

Means and t-test Values for Dependent Variables, Congruent vs. Incongruent Treatment

Variable	Means		"t"	
	Congruent Treatment (N=26)	Incongruent Treatment (N=26)		
Spelling	.0208	.0170	1.07	NSD*
Punctuation	.0134	.0102	1.24	NSD
Time	33.7467	31.5589	.70	NSD
Rate	6.8173	6.6124	.47	NSD
Readability	46.2522	48.0880	1.28	NSD

*p>.05, one-tailed

H 1.1, Spelling. A word was considered misspelled if it did not conform to spelling in Webster's New World Dictionary, second edition (1972), or, where applicable, The Associated Press Stylebook, revised edition, (1970), used by journalism students. Spelling errors included uncorrected typographical errors (omitted letters, juxtaposition of letters, but not overstrikes) and misuse of upper and lower case letters. Misuse of hyphens and apostrophes also counted as spelling errors. Multiple errors in a single word counted as one error. The score for spelling was computed by dividing the number of errors by the total number of words.

Scorer reliability (self-self) was developed by practicing on reports written by the researcher's speech classes. Reliability

of the research scoring was then determined for five editorials taken at random from the experimental sample. The examiner scored each of the five editorials twice, with at least two weeks between scoring sessions. A Rho correlation of .92 between rank-orders of errors on the five editorials was achieved.

The "t" value of 1.07 led to rejection of hypothesis 1.1 that students would make more spelling errors when encoding a message incongruent with their beliefs than when encoding a belief-congruent message. Means and "t" values for the measure of spelling errors appear in Table 2.

H 1.2, Punctuation. An error was tallied when any of the following punctuation marks was omitted, misplaced, or used unnecessarily: quotation mark, comma, period, and question mark. Errors were counted if such punctuation did not conform to The Associated Press Stylebook, revised edition (1970). Failure to space after punctuation also constituted an error. The score for punctuation errors was computed by dividing total errors by total number of words.

Scorer reliability (self-self) was developed by practicing on reports written by the researcher's speech classes. Reliability of the research scoring was then determined for five editorials taken at random from the experimental sample. The examiner scored each of the five editorials twice, with at least two weeks between scoring sessions. A Rho correlation of .88 between rank-orders of errors on the five editorials was achieved.

The "t" value of 1.24 led to rejection of hypothesis 1.2 that students would make more punctuation errors when encoding a message incongruent with their beliefs than when encoding a belief-congruent message. Means and "t" values for the measure of punctuation errors appear in Table 2.

H 1.3, production time. Writing time for each editorial was measured in minutes and seconds, and converted to fractional minutes for statistical analysis. The "t" value of .70 led to rejection of the hypothesis that students would take more time to write when encoding a message incongruent with their beliefs than when encoding a belief-congruent message. Table 2 shows means and "t" values for the time measure.

H 1.4, production rate. Production rate was determined by dividing total words by production time. The "t" value of .47 led to rejection of the hypothesis that students would produce fewer words per minute when encoding a belief-incongruent message than when encoding a belief-congruent message. Means and "t" values for the production rate measure appear in Table 2.

H 1.5, readability. Readability scores were determined using the computerized ITEST program containing the RDSCR readability formula (see Appendix IV). The "t" value of 1.28 led to rejection of the hypothesis that students would produce less readable messages when encoding a message incongruent with their beliefs than when encoding a belief-congruent message.

Table 2 shows means for the readability measure. High scores represent more readable messages; operationally they represent the

ability of college undergraduates to replace words deleted from a text (cloze procedure).

Hypothesis 2, order effect

The rationale for testing hypothesis 2--that the order of writing assignments will not significantly affect the results--was that if order was not confounding the results, then significant differences should not appear on scores of dependent variables: 1) between messages written in the same condition (Group A, T_1 vs. Group B, T_2), and 2) between conditions within subgroups.

The first test of order effect was done by comparing means on each dependent variable for all editorials written first (T_1) with all editorials written second (T_2), using the "t" formula for small uncorrelated samples. For example, congruent readability for Group A (congruent treatment first) was compared with congruent readability for Group B (incongruent treatment first). Results of this analysis appear in Table 3.

A further test of order effect was done by using the formula for "t" to compare different conditions for each dependent variable within each subgroup: congruent vs. incongruent messages in Group A and congruent vs. incongruent messages in Group B.

The values of "t" were significant for both subgroups on the variables time, rate, and readability. Table 4 shows that wherever there is a significant difference, performance is better for the second editorial written, with results for Group A going opposite the direction hopothesized and results for Group B going in the predicted direction.

Table 3

Order Effects: Means and "t" Values of T_1 vs. T_2 for Each Dependent Variable

Variable	Means T_1	T_2	"t"
Congruent treatment (Group A vs. Group B)			
Spelling	.02	.02	.45
Punctuation	.01	.01	.22
Time	39.06	27.54	2.94*
Rate	5.59	8.25	2.95*
Readability	43.73	49.20	1.96
Incongruent treatment (Group B vs. Group a)			
Spelling	.02	.02	.65
Punctuation	.01	.01	.41
Time	36.06	27.70	2.37*
Rate	6.74	6.51	.27
Readability	46.83	49.16	.89

*$p < .05$, two-tailed

A=Congruent treatment first

B=Incongruent treatment first

Table 4

Means, "t" Values, and Associated Probabilities for Subgroups A and B Showing Direction in Relation to Research Prediction

Variable	Means T_1	Means T_2	"t"	Probability	Direction
Group A (congruent followed by incongruent)					
				two-tailed	
Spelling	.02	.02	.72	NSD*	
Punctuation	.01	.01	1.30	NSD	
Time	39.06	27.70	3.81	.002	opposite predicted
Rate	5.59	6.51	2.23	.044	opposite predicted
Readability	43.73	49.16	2.72	.019	opposite predicted
Group B (incongruent followed by congruent)					
				one-tailed	
Spelling	.02	.02	.82	NSD	
Punctuation	.01	.01	.44	NSD	
Time	36.06	27.54	2.10	.030	direction predicted
Rate	6.74	8.25	2.36	.038	direction predicted
Readability	46.83	49.20	1.82	.048	direction predicted

*$p > .05$

Paired scores were then examined using Pearson product-moment correlations (contained in the SPSS V-6.00 program) to compare different conditions within each subgroup. The purpose was to determine if significance resulted from order of writing, not some other variable(s). If the order of writing had a simple linear effect on the magnitude of scores in the conditions experienced by subgroups, and since there was no significant effect due to conditions themselves, relative positions in the distributions would remain the same in both conditions, resulting in a high positive correlation. Even if there was a significant difference within a subgroup, correlations would still be high if order of treatment were having a linear effect. The lack of a high positive correlation could indicate that order effect was not simple or that another variable (or variables) influenced scores.

As Table 5 shows, moderate but significant Pearson product-moment correlations were found in comparison of congruent-incongruent editorials on the following variables: Group A--punctuation, rate, and readability; Group B--readability.

Conclusion

What remains, with the rejection of all research hypotheses predicting that writing a message incongruent with personal beliefs would lead to less skillful writing than writing a message congruent with personal beliefs? To explain this unexpected outcome, a closer examination of the role of order effect was called for. This was

Table 5

Pearson "r" Correlations between Congruent and Incongruent Scores on Each Dependent Variable by Subgroup

Variable	"r"
Group A (congruent vs. incongruent)	
Spelling	.167
Punctuation	.476*
Time	.069
Rate	.690*
Readability	.612*
Group B (congruent vs. incongruent)	
Spelling	.373
Punctuation	-.003
Time	.106
Rate	.609
Readability	.665*

*$p < .05$

done by looking at findings, first for the combined treatment groups (AB) and then for the subgroups, A (congruent treatment first) and B (incongruent treatment first) separately. The presence of order effect on some variables can perhaps be explained as a manifestation of initial anxiety that is reduced by the act of writing. When told they would be writing editorials, some students responded with remarks suggesting apprehension, such as, "We've never written editorials before."

While Greenberg did not test for order effect, his results hinted at its presence. He found that while he could not state empirically that encoding per se reduced stress (as measured by students' self-reports on a Nowlis-Green mood scale), he could nevertheless attribute stress reduction more directly to irrelevant encoding (encoding without stress induction) than to not encoding (Greenberg, 1961).

AB group: significant findings

Whether writing congruent or incongruent messages, students took less time for the second encoding than for the first. This fact raises the possibility that students, who were allowed to leave after completing the second editorial, may have taken advantage of the opportunity to get out of class a bit early.

Order of writing was also significant on the production rate variable when students wrote belief-congruent editorials. Production rate was higher when the congruent editorial was the second (Group B, T_2) rather than the first (Group A, T_1)

editorial students wrote. However, the difference between T_1 and T_2 production means for the incongruent editorial writing assignment did not approach significance. There are two possible explanations for these results. One is that it could be a research artifact, perhaps a function of the small number of cases. Second, it could suggest that students' performance improves the longer they write in a congruent condition, but that performance might not improve over time if they were writing in an incongruent condition. The author suggests a need for further study of these findings.

A and B subgroups: significant findings

The most compelling evidence in support of the influence of order effect comes from inspection of results for each variable where significance was found (T_1 vs. T_2 within subgroups). Wherever there is a significant difference, it reflects improved performance on the second editorial writing task over the first (see Tables 4 and 5).

Specifically, findings on the variables time, rate, and readability showed improvement of performance on the incongruent (second) message for Group A and on the congruent (second) message for Group B. Additionally, findings of moderate correlations on punctuation, rate, and readability for Group A and readability for Group B show that the results on these measures are probably in part a function of order. However, the magnitude of the correlations (+.69 to .48) on these measures and the absence of significant correlations for the other dependent variables indicate

that some variable (or variables) other than order is greatly affecting the scores.

Clearly the findings of significant differences in the predicted direction for Group B and in the opposite direction for Group A on the variables time, rate, and readability would have considerable bearing on rejection of those research hypotheses concerning these variables. The findings on the readability measure seem to be especially indicative of order effect, with the values of "t" buttressed by moderate positive correlations in each subgroup. While these findings cannot be extrapolated beyond a population of journalism students, they are nevertheless useful in suggesting a need for incorporating order effect as a variable in future studies of belief-congruent vs. belief-incongruent message encoding.

Various dimensions of this study raise other questions that might be considered in future research. Does allowing students to leave class when they have completed an experimental assignment influence the amount of time they spend on the assignment? Is writing belief-incongruent editorials stressful? Does encoding per se reduce stress and improve performance? Does encoding belief-congruent, but not belief-incongruent, editorials reduce stress and improve performance? Do congruency and order of writing interact to influence performance? Are there personality variables, such as degree of compliance, that influence students to "bend over backwards" to perform well for an anticipated audience? Is writing belief-incongruent editorials for a researcher vs. writing for a public audience different in the degree of stress felt by

the writer? Finally, researchers need to deal with the "real world" and ask, does the amount of writing or reporting experience influence performance in belief-incongruent encoding?

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Appendix I

NAME: _____

STUDENT OPINION SURVEY

Following are 25 propositions on which you are asked to indicate both the direction and intensity of your beliefs. Indicate your responses according to the following scales:

Direction of Belief (D)

Agree +3 +2 +1 0 -1 -2 -3 Disagree

Intensity of Belief (I)

Important to me 7 6 5 4 3 2 1 Not important to me

1. D___ To bring an end to politically motivated skyjackings
   I___ governments should refuse to negotiate with terrorists even if it means sacrificing hostages.
2. D___ Passage of the Equal Rights Amendment will hurt,
   I___ not help, women.
3. D___ Abortions should be legally available during the
   I___ first 12 weeks of pregnancy.
4. D___ Congress should order a halt to research into "genetic
   I___ engineering" because of the possibility of creating a deadly organism.
5. D___ The speed limit on interstate highways should be
   I___ raised to 75 m.p.h.

6. D___ Congress should abolish compulsory retirement age
   I___ limits.
7. D___ The U.S. Air Force should be required to make public
   I___ its classified information on UFO's.
8. D___ The government is delaying development of new
   I___ fuels to guarantee a market for oil companies.
9. D___ The only path to heaven is through belief in
   I___ Jesus Christ.
10. D___ In an affluent society such as ours, welfare is
    I___ a right, not a privilege.
11. D___ Human beings evolved from lower forms of life.
    I___
12. D___ Capital punishment deters criminals.
    I___
13. D___ Convicted child molesters should be executed.
    I___
14. D___ The white race is superior to the black race.
    I___
15. D___ The black race is superior to the white race.
    I___
16. D___ Private ownership of guns should be outlawed.
    I___
17. D___ Cameras and tape recorders should be allowed
    I___ in courtrooms.

18. D___ Intercollegiate football at UNO should be
I___ abolished.

19. D___ Homosexuality should be just cause for a school
I___ district to dismiss a teacher.

20. D___ Courts should take away the children of persons
I___ convicted more than once of child abuse.

21. D___ Sex education belongs in the home, not in the
I___ schools.

22. D___ Possession of small amounts of marijuana should
I___ be legalized.

23. D___ The state of Nebraska should allow homosexual
I___ couples to marry.

24. D___ The government should ban sale of recreational
I___ vehicles in order to conserve energy resources.

25. D___ Contraceptives should be provided to sexually
I___ active girls under legal age with or without
parental consent.

Appendix II

Group A, Congruent Treatment First:

(Scores and Means=14)

	Readability		Spelling		Punctuation		Total Words		Production time		Production rate (wpm)	
	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2
1.	35.25	53.83	.0078	.0060	.0469	.0241	128	166	37.40	44.37	3.4225	3.7415
2.	40.17	40.79	.0324	.0075	.0065	.0075	154	133	34.30	17.57	4.4898	7.5711
3.	46.33	44.75	.0040	.0400	.0246	.0080	244	250	45.87	39.55	5.3198	6.3211
4.	55.74	55.41	.0547	.0113	.0313	.0000	128	176	29.70	27.20	4.3098	6.4706
5.	49.28	57.84	.0130	.0060	.0000	.0000	154	165	43.70	32.92	3.5240	5.0127
6.	40.74	47.67	.0000	.0000	.0000	.0135	131	222	26.20	32.12	5.0000	6.9123
7.	53.89	53.46	.0052	.0050	.0104	.0050	192	200	50.63	29.92	3.7919	6.6852
8.	54.48	54.19	.0268	.0219	.0077	.0146	261	137	34.97	23.73	7.4642	5.7724
9.	36.45	36.62	.0079	.0394	.0039	.0050	252	201	24.78	23.93	10.1681	8.3982
10.	40.56	34.87	.0089	.0000	.0000	.0000	225	88	42.10	15.23	5.3444	5.7767
11.	38.83	47.52	.0361	.0067	.0136	.0000	221	149	41.87	26.42	5.2787	5.6404
12.	52.30	54.08	.0230	.0073	.0115	.0110	347	272	36.97	26.55	9.3868	10.2448
13.	37.72	56.81	.0414	.0526	.0261	.0376	193	133	49.02	20.98	3.9374	6.3383
14.	30.45	40.46	.0119	.0118	.0119	.0059	336	170	49.40	27.37	6.8016	6.2119
Means	43.728	49.164	.020	.015	.014	.009	212	176	39.064	29.704	5.588	6.507

Appendix III

Group B, Incongruent Treatment First:

(Scores and Means=12)

	Readability		Spelling		Punctuation		Total Words		Production time		Production rate (wpm)	
	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2	T_1	T_2
15.	55.23	58.03	.0290	.0138	.0145	.0276	138	145	16.33	13.80	8.4490	10.5072
16.	46.65	43.48	.0311	.0247	.0089	.0247	225	243	26.58	36.58	8.4640	6.6424
17.	46.85	52.37	.0171	.0109	.0171	.0000	175	201	39.43	47.83	4.4379	4.2020
18.	43.45	46.61	.0000	.0145	.0135	.0000	148	138	41.32	40.38	3.5820	3.4173
19.	41.60	39.35	.0269	.0407	.0346	.0163	260	123	54.53	14.77	4.7677	8.3296
20.	43.13	53.04	.0200	.0615	.0050	.0000	200	179	39.98	18.65	5.0020	9.5979
21.	42.93	39.80	.0321	.0304	.0040	.0101	249	296	27.98	27.53	8.8982	10.7506
22.	49.92	47.53	.0112	.0060	.0112	.0120	267	333	35.37	31.55	7.5495	10.5547
23.	43.40	50.39	.0152	.0106	.0102	.0265	197	189	35.58	23.83	5.5363	7.9300
24.	50.64	54.76	.0108	.0213	.0086	.0030	464	329	36.88	32.70	12.5802	10.0612
25.	48.28	55.08	.0133	.0170	.0000	.0254	225	118	32.50	13.13	6.9230	8.9848
26.	49.91	49.93	.0187	.0167	.0047	.0084	214	239	46.18	29.75	4.6337	8.0336
Means	46.832	49.197	.019	.022	.011	.013	230	211	36.057	27.543	6.735	8.251

Appendix IV

Reliability and Validity of the ITEST Readability Program

Readability is a measure of ease of understanding (Klare, 1963). It reflects difficulty of style, not quality of writing or content. The computerized ITEST readability program developed by Rayfield (1977) employs his RDSCR readability formula based on word length, sentence length, and probabilities of certain digraph (two-letter) combinations. The complexity of the RDSCR formula and its application prevents its inclusion here, however, the researcher wishing to replicate this study could obtain Rayfield's doctoral dissertation from Dissertation Abstracts International (volume not yet published as of this writing) or the Newspaper Publishers Association Research Institute.

Reliability is not usually a problem in computerized readability formulae. As long as sample data are prepared accurately, the computer will provide the same readability analysis regardless of how many times the analysis is done.*

Validity of RDSCR was tested by Rayfield using a comparison of RDSCR with Danielson-Bryan and Flesch readability formulae, which were developed against criterion scores from McCall-Crabbs passages. RDSCR correlated .95 with Danielson-Bryan and .96 with Flesch. RDSCR correlated .9 with the cloze criterion (ability of college undergraduates to replace deleted words in a text.

*Rayfield, R. E. Personal communication, March, 1978.

The readability score can be converted to represent a grade level of difficulty as follows:

Score	77	70	65	58	52	49	47	40	38	34	30	27	33	18
Grade	4	5	6	7	8	9	10	11	12	13	14	15	16	17