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Effects of Need for Cognition on Message Evaluation, Recall, and Persuasion

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This research concerns the relation among need for cognition, message processing, and persuasion. Pairs of subjects holding approximately the same attitude toward instituting senior comprehensive exams and differing widely in their scores on the need for cognition scale were recruited to participate in the first study. In Experiment 1, subjects read a set of either strong or weak arguments supporting the recommendation that senior comprehensive exams be instituted. Results revealed that argument quality had a greater impact on the message evaluations and source impressions provided by individuals high than by those low in need for cognition and that subjects high in need for cognition reported expending more cognitive effort and recalled more message arguments regardless of argument quality. The major findings in Experiment 1 were replicated in Experiment 2 with a different topic (i.e., raising student tuition) and cover story. In addition, the inclusion of a postcommunication attitude measure revealed that the attitudes of individuals high in need for cognition were more affected by argument quality than those of subjects low in need for cognition. Together, these studies document a reliable difference among individuals in their tendency to derive information from and elaborate on externally provided message arguments.

Social psychology is replete with theories based on the premise that people, if not commonly enjoying, are at least commonly engaging in effortful problem solving as they steer their course through their social environment. The emphasis on the view that people actively process information is apparent, for example, in the vintage theories of social comparison (Festinger, 1954), cognitive consistency (Abelson et al., 1968), and attribution (Heider, 1958; Kelley, 1967) and in the recent interest in "social cognition." This view contrasts with the notion that "behavior is actually accomplished much of the time without paying attention to the substantive details of the 'informative' environment" (Langer, Blank, & Chanowitz, 1978, p. 635).

The present research focuses on a particular and pervasive component of our social environment: persuasive communications. Will (1982) estimated that the average American is exposed to more than 1,500 persuasive messages daily from national advertisers alone. People have neither the resources to think exhaustively about every persuasive appeal to which they are exposed nor the luxury (or apparently the inclination) of being able to ignore them all. Elsewhere, we have suggested that situational factors can play an important role in enabling and motivating individuals to think extensively versus superficially about the merits of an appeal. In one such study (Petty & Cacioppo, 1979), subjects were exposed to a counterattitudinal advocacy containing either strong arguments (i.e., they elicited primarily favorable thoughts about the appeal in a pretest) or weak arguments (i.e., they elicited primarily unfavorable thoughts about the ap-

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peal in a pretest). Some subjects were led to believe the recommendation would affect them personally (high issue involvement), and others were led to believe it had few personal ramifications (low issue involvement). Results indicated that subjects engaged in greater scrutiny of the information in the message under high than under low issue involvement. Consequently, argument quality was a more important determinant of the postcommunication attitudes of subjects who believed the recommendation was personally important than of those who believed it was unimportant. Similarly, Petty, Wells, and Brock (1976) exposed subjects to a strong or a weak set of persuasive arguments under conditions of low or high distraction. Distraction disrupted message evaluation, and, as a result, subjects' attitudes were affected by argument quality when distraction was low, but not when distraction was high (see Petty & Cacioppo, 1983, for a review of how other situational factors affect people's motivation and ability to engage in issue-relevant thinking).

We reasoned that just as there are situational factors such as distraction and issue involvement that influence the likelihood that individuals will think about and elaborate on the externally provided message arguments, so too must there be dispositional factors governing message processing and, indirectly, persuasion. Our reading of the literature suggested that the individual difference described by Cohen, Stotland, and Wolfe (1955; Cohen, 1957, Note 1) as *need for cognition* was a particularly promising factor to examine. Indeed, although it was overlooked at the time, Cohen et al.'s initial study on need for cognition, in retrospect, may have been the first to demonstrate that individuals high in need for cognition scrutinize communications more, and are more affected by its cogency, than are subjects low in need for cognition. Subjects read a story about an interview between a student and a potential employer and then rated the story in terms of how much they liked it, how interesting they found it, and so forth. Some subjects read a well-organized story, whereas others read an ambiguous story. As might be expected, the ambiguous story was evaluated more negatively overall than the structured story, but this discriminating judgment seemed only to characterize individuals high in need for cognition.

The objective tests used to gauge individual differences in need for cognition were never described in detail or published and are apparently no longer available, so our initial efforts were necessarily aimed at developing and validating an assessment instrument (Cacioppo & Petty, 1982; Cacioppo, Petty, & Kao, in press). In the first study, we generated a pool of questions concerning a person's reactions to demands for effortful thinking in a variety of situations (Cacioppo & Petty, 1982). When generating these, we specifically included items describing a variety of situations in which people could choose to garner information, analyze available evidence, abstract from past experiences, or synthesize ideas; explicitly excluded were items dealing with inner broodings, reverie, mystical or religious experience, mind wandering, and artistic imaginings. Hence, the need for cognition scale (NCS) was designed to distinguish between individuals who dispositionally tend to engage in and enjoy effortful analytic activity and those who do not. Following pilot testing to identify ambiguous items in need of rewording or deletion, the set of items was administered to two groups of individuals presumed to differ substantially in their tendency to engage in and enjoy effortful cognitive endeavors (i.e., members of a university faculty vs. assembly line workers in the neighboring communities). Criteria of ambiguity, irrelevance, and internal consistency were employed to select the items for the NCS, and a factor analysis of these items confirmed that one factor was dominant. A second study, in which the NCS was administered to a more homogeneous population (undergraduate students in an introductory psychology class), validated the factor structure obtained in the first study. Finally, correlations with what were expected to be related (e.g., open-mindedness) and unrelated (e.g., test anxiety) constructs provided discriminant and convergent evidence for the validity of the NCS (Cacioppo & Petty, 1982, in press).

Evidence that individuals high in need for cognition do indeed enjoy relatively effortful cognitive tasks even in the absence of feedback about performance was obtained in Study 4 of Cacioppo and Petty (1982). Subjects used

either simple or complex instructions while performing a boring number-circling task. Afterward, subjects expressed their attitudes toward the task. It was not surprising that subjects generally disliked the task, but a significant interaction revealed that people high in need for cognition tended to prefer the complex to the simple task whereas people low in need for cognition tended to prefer the simple to the complex task.

Having achieved a means for assessing need for cognition, we were in a position to return to the question that initiated our interest in this disposition: Do individual differences in need for cognition predict the likelihood that recipients will extract and cognitively elaborate on information from a persuasive communication? Experiment 1 was designed as a conceptual replication of Petty, Harkins, and Williams (1980), with the major difference being that we examined the role of a dispositional (need for cognition) rather than a situational (group size) factor on cognitive effort and message evaluation. Experiment 2 was subsequently conducted to examine the effects of need for cognition and argument quality on persuasion.

Experiment 1

In Experiment 1, we varied the cogency of the message arguments supporting the recommendation that seniors be required to pass a comprehensive exam in their major as a requirement for graduation (a counterattitudinal advocacy). Subjects, who were selected following preliminary testing on the basis of their scores on the NCS and their initial attitudes toward the recommendation, were told that their task was to evaluate an editorial written by a journalism student. They then read either a strong or a weak set of arguments supporting the recommendation to institute senior comprehensive exams. We expected the results would be reminiscent of those obtained when situational factors such as issue involvement (Petty & Cacioppo, 1979), group size (Petty et al., 1980), or distraction (Petty et al., 1976) were manipulated. Specifically, although we expected the version of the message containing strong arguments to be evaluated more positively than the version containing weak arguments by all subjects, this difference was expected to be stronger for individuals who carefully scrutinize the message (i.e., subjects high in need for cognition) than for those who do not (i.e., subjects low in need for cognition).

Method

Preliminary Test

Five hundred twenty-seven undergraduate students in introductory psychology classes participated in a preliminary testing session during which they completed a battery of tests. Included in the battery were the 34-item NCS (Cacioppo & Petty, 1982) and an attitude survey regarding campus issues (e.g., raising student tuition, instituting senior comprehensive exams). Students were classified as being low, moderate, or high in need for cognition based on their responses to the NCS, and pairs of students who differed dramatically in need for cognition (i.e., who fell in the bottom or the top tripartite of scores) and who reported approximately the same attitude toward instituting senior comprehensive exams were recruited for possible participation in Experiment 1. Students did not know what facet of the preliminary testing was responsible for their eligibility, and the experimenter did not know the subjects' levels of need for cognition when they arrived at the laboratory.

Design and Procedure

One hundred fourteen undergraduates (53 men and 61 women) ultimately participated in a 2 (Need for Cognition) × 2 (Argument Quality) factorial. Subjects were tested in groups of 5 to 16 in cubicles constructed so that no subject could have visual or verbal contact with any other subject. It was possible, therefore, to run all experimental conditions simultaneously.

At the beginning of the experimental session, subjects were instructed that the University of Iowa's branch of the National Society of Journalism Teachers was undergoing an evaluation of its programs and that the psychology department was assisting by studying the subjective impact of various journalistic styles. The subjects were further told that they would be reading an editorial prepared by a journalism student for possible broadcast and publication. Subjects were asked simply to provide an evaluation of the editorial.

Immediately following these background comments, the subjects read either a strong or a weak set of arguments favoring the recommendation that senior comprehensive exams be instituted as a prerequisite for graduation at their university. Afterward, subjects completed a dependent variable booklet and participated in another study that is irrelevant to the present discussion. At the conclusion of the study, subjects were debriefed, thanked, and dismissed.

Independent Variables

Need for cognition. Subjects' classification as being high or low in need for cognition was based on their responses to the NCS, obtained several weeks earlier in the prelim-

inary test (see above). Although the separation of the preliminary test from Experiment 1 by several weeks may have weakened this factor, we reasoned that need for cognition would not be an important recipient factor to consider should it not represent a fairly stable individual difference. Students whose NCS scores fell within the middle tripartite were not recruited to participate in Experiment 1 to minimize any errors in classification that could result when, as in our preliminary test, there are clusters of individuals scoring at and near the median value.

Argument quality. All subjects read an editorial that they believed had been prepared by a journalism student for possible publication in the local newspaper. The editorials were approximately 300 words long and contained either six strong or six weak arguments for instituting senior comprehensive exams. These sets of arguments, which were essentially those described as the "strong" and "very weak" communications in Petty et al. (1980), were pretested and adjusted as necessary to assure that the strong version elicited primarily favorable thoughts and the weak version elicited primarily unfavorable thoughts from both subjects high and subjects low in need for cognition.[1]

Dependent Variables

Message evaluation. We postulated that subjects high, in contrast to those low, in need for cognition would discriminate between the strong and the weak versions of the message arguments when evaluating the editorial. In order to assess message evaluation, subjects were asked to rate the editorial, using the following 9-point scales: (a) "To what extent do you feel the communication made its point effectively?" (1 = not at all, 9 = completely); (b) "To what extent did you like the communication?" (1 = not at all, 9 = very much); (c) "To what extent do you feel the communication was convincing?" (1 = not at all, 9 = very convincing); (d) "Considering both content and style, how well written was the communication?" (1 = poorly written, 9 = very well written); and (e) "Would you judge the reasons given for supporting the recommendation in the preceding message as being . . ." (1 = very poor and uncompelling, 9 = very good and compelling). The average of each subject's responses to these five questions served as the general index of message evaluation.

Cognitive effort. We also postulated that people high, in contrast to those low, in need for cognition would be thinking more extensively about the message arguments. Two questions were embedded in the postexperimental questionnaire to test this hypothesis: "To what extent were you trying hard to evaluate the student's performance as a journalist?" (1 = not at all, 9 = very much) and "How much effort did you put into evaluating the communication?" (1 = none, 9 = very much). The average of each subject's responses to these two questions served as the index of cognitive effort.

Recall of message arguments. In pilot research (Petty, Note 2), subjects high in need for cognition recalled more message arguments than did subjects low in need for cognition. In order to determine whether this was a reliable finding, subjects in the present study were asked to list as many of the message arguments as they could remember. Subjects, who had not expected this recall test, were given 5 minutes to list arguments. Subsequently, two judges independently determined the number of arguments each subject correctly recalled. Judges were unaware of the experimental hypotheses and any subject's level of need for cognition, though of course judges knew whether they were scoring recall from the strong or the weak version of the message. An item listed by a subject was counted correctly recalled if it expressed one of the six arguments contained in the appropriate message. Arguments listed twice by a subject were counted only once. The interrater reliability was .74, and the judges' counts were averaged prior to analyses to derive the index of message recall.

Ancillary questions. Several additional items were embedded in the questionnaire to maintain the cover story and for exploratory purposes. Subjects were asked, "Would you judge the source of the preceding message as being . . ." (1 = very low in expertise, 9 = very high in expertise); "Would you judge the source of the preceding message as being . . ." (1 = very untrustworthy, 9 = very trustworthy); "Would you judge the recommendation made in the preceding message as being . . ." (1 = very unimportant to you personally, 9 = very important to you personally); and "Would you characterize the preceding message as being . . ." (1 = not at all worth thinking about, 9 = very much worth thinking about).

Results

Because not every student we recruited to participate in Experiment 1 appeared, a one-way analysis of variance (ANOVA) was performed first to determine whether the subjects who participated in Experiment 1 differed in their initial attitude toward instituting senior comprehensive exams. The results confirmed that the attempt to match subjects on this measure was successful (Ms = 4.02 and 4.06 on a 9-point scale for subjects low and those high in need for cognition, respectively; $F < 1$). Next, subjects' responses in Experiment 1

[1] Argument quality has been defined operationally such that "strong" arguments elicit more favorable than unfavorable statements, as assessed by the thought-listing technique (cf. Cacioppo & Petty, 1981) and "weak" arguments elicit more unfavorable than favorable thoughts about the recommendation (e.g., see Petty & Cacioppo, 1979; Petty et al., 1976). In pretests for the present study, we observed that a "strong" message that we had used previously again tended to elicit more favorable than unfavorable thoughts when need for cognition was ignored. However, when the profile of cognitive responses was examined within each need-for-cognition group, we found that people high in need for cognition were actually generating slightly more unfavorable thoughts (e.g., counterarguments) than favorable thoughts to the strong message. Modifying the strong arguments (e.g., by fabricating more impressive and believable statistics) proved sufficient to elicit primarily favorable thoughts from both individuals high and those low in need for cognition.

were submitted to 2 (Need for Cognition) × 2 (Argument Quality) ANOVAs.[2]

Cell means for message evaluation are depicted in Figure 1. As expected, the ANOVA yielded two significant effects on this measure: a main effect for argument quality, $F(1, 110) = 160.86$, $p < .001$, which simply reflected that the strong arguments were judged more positively ($M = 5.86$) than the weak arguments ($M = 2.26$), and a Need for Cognition × Argument Quality interaction, $F(1, 110) = 22.45$, $p < .001$ (see Figure 1). Pairwise comparisons by the Duncan multiple-range test revealed that individuals high in need for cognition provided more discriminating judgments of these externally provided arguments than did individuals low in need for cognition.

We have found that people scrutinize a persuasive message more when they believe the recommendation is personally relevant than when they believe it is irrelevant (e.g., Petty & Cacioppo, 1979). In the present study, we reasoned that individuals high in need for cognition were more likely to cogitate generally and about persuasive communications specifically, but it is possible that they viewed the persuasive appeal about senior comprehensive exams as more personally relevant. If the latter was the case, then a main effect for need for cognition should obtain on the appropriate ancillary measure included in this study. Analysis of the measure regarding issue involvement ruled out this alternative interpretation. However, a main effect for argument quality, $F(1, 110) = 4.46$, $p < .05$, indicated that the recommendation was considered more important when supported by strong rather than weak arguments, and a Need for Cognition × Argument Quality interaction, $F(1, 110) = 4.47$, $p < .05$, reflected that subjects high in need for cognition rated the recommendation as being more important when it was supported by strong rather than weak arguments, whereas argument quality did not alter the ratings of subjects low in need for cognition (see Table 1).

The results of analysis of the recall data, which revealed one significant effect, were also consistent with the notion that individuals high in need for cognition extracted more from, and thought more about, the message arguments. Subjects high in need for cognition recalled substantially more arguments ($M = 3.98$) than their counterparts ($M = 2.91$), $F(1, 110) = 13.62$, $p < .01$. Analysis of the measure of cognitive effort also revealed that subjects high in need for cognition reported expending more effort thinking about the editorial ($M = 5.93$) than did subjects low in need for cognition ($M = 4.98$), $F(1, 110) = 9.61$, $p < .01$. A main effect for argument quality signified that subjects reported thinking more about the weak than the strong message arguments, $F(1, 110) = 6.78$, $p < .05$, but a Need for Cognition × Argument Quality interaction indicated that this effect primarily characterized subjects high in need for cognition, $F(1, 110) = 6.48$, $p < .05$ (see Table 1).

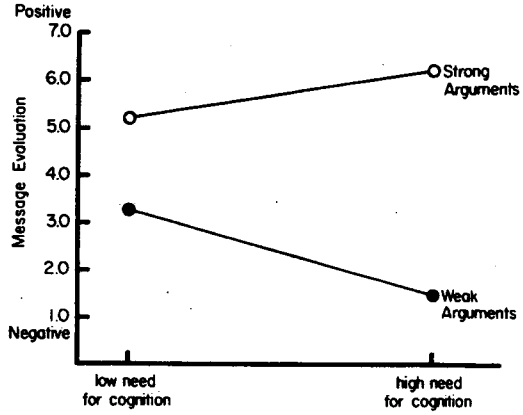

Figure 1. Message evaluation as a function of argument quality and need for cognition.

Yet another suggestion that individuals high in need for cognition were thinking more about the message arguments comes from their judgments of the communicator. Recall that subjects knew nothing about the communicator other than that he or she was a journalism student who had written an editorial that they had read. The subjects' impressions of the communicator are summarized in Table 1. It is not surprising that subjects perceived the communicator to be more expert, $F(1, 110) = 84.38$, $p < .01$, and trustworthy, $F(1, 110) = 135.69$, $p < .001$, after they had been exposed to the strong rather than the weak arguments. However, these effects were clearly

[2] Initial attitudes were also equivalent across conditions when a 2 (Need for Cognition) × 2 (Argument Quality) analysis of variance was performed (all Fs < 1).

Table 1
Ratings of the Persuasive Communication as a Function of Need for Cognition and Argument Quality

Variable	Low need for cognition		High need for cognition	
	Weak argument	Strong argument	Weak argument	Strong argument
Cognitive effort	5.00_a	4.96_a	6.60_b	5.25_a
Importance of recommendation	$5.80_{a,b}$	$5.67_{a,b}$	4.90_a	6.53_b
Trustworthiness	3.64_b	5.08_c	1.83_a	5.86_c
Expertise	2.88_b	4.83_c	1.07_a	5.58_c
Worth considering further	4.64_a	5.96_b	3.62_a	6.89_b

Note. Means in a given row with dissimilar subscripts differ at $p < .05$ by the Duncan multiple-range test.

stronger for individuals high than those low in need for cognition. The Need for Cognition × Argument Quality interactions were significant for both trustworthiness, $F(1, 110) = 18.05$, $p < .01$, and expertise, $F(1, 110) = 21.00$, $p < .01$. Means and pairwise comparisons for these measures are summarized in Table 1.

Analysis of the ancillary question regarding how worthwhile it would be to think further about the recommendation yielded two significant effects. A main effect for argument quality indicated that subjects viewed the recommendation as deserving more consideration when it was supported by strong ($M = 6.43$) than rather than weak ($M = 4.13$) arguments, $F(1, 110) = 44.04$, $p < .001$, and a Need for Cognition × Argument Quality interaction again indicated that this effect was more apparent for subjects high than for those low in need for cognition, $F(1, 110) = 6.81$, $p < .05$ (see Table 1).[3]

Experiment 2

The most common strategy employed in investigations of the role of recipient factors in persuasion is to search for a particular personality trait that renders people generally susceptible or resistant to influence (e.g., Janis & Field, 1959). Eagly (1981) referred to this as the "personality strategy." A second, termed the "attitude change strategy," involves deriving hypotheses about individual differences in general persuasibility from postulates in attitude theories (e.g., Eagly & Teelak, 1972). Eagly suggested that neither strategy has been particularly successful: The former fails to consider the underlying cognitive processes postulated to be responsible for persuasion, and the latter fails to consider stable individual differences in cognitive ability, motivation, and style. The present research illustrates a third hybrid approach wherein the focus is on individual differences in attitudinal processing. The results of Experiment 1 showed that subjects high in need for cognition were more likely to (a) discriminate between the strong and the weak versions of the message arguments when evaluating the merits of the supportive arguments, (b) be affected by the quality of these externally provided message arguments when forming impressions of the communicator, (c) recall more message arguments regardless of their cogency, and (d) report expending more cognitive effort than were individuals low in need for cognition.

There is, however, a potential problem with the generalizability of the results in Experiment

[3] Reanalysis of these data with sex of subject as a factor did not change any of the conclusions reported above. A Sex of Subject × Need for Cognition interaction was obtained on the measure of cognitive effort, a result indicating that although people high in need for cognition reported expending more cognitive effort than individuals low in need for cognition, this difference was stronger for males than for females, $F(1, 106) = 6.63$, $p < .05$. Two additional findings involving the factor of sex of subject were obtained in the analyses of the ancillary measures. First, a main effect for sex of subject indicated that female subjects judged the recommendation to be more important personally ($M = 6.30$) than did male subjects ($M = 5.17$), $F(1, 106) = 7.74$, $p < .05$. Second, a Sex of Subject × Need for Cognition × Argument Quality interaction on the measure of trustworthiness indicated that the two-way interaction noted above was more apparent for males than for females, $F(1, 106) = 6.13$, $p < .05$. No other tests involving this factor were significant.

1. Analyses of the attitude surveys that the 527 students completed during the preliminary testing suggested that individuals high in need for cognition possess more positive attitudes toward intellective issues (i.e., recommendations with implications for effortful thinking) but similar attitudes toward nonintellective issues, when compared with students low in need for cognition. Analyses of the data from these 527 students revealed that those high in need for cognition held more positive attitudes toward instituting senior comprehensive exams (high, $M = 4.05$; low, $M = 3.38$; $p < .05$) and less positive attitudes toward adopting narrower college curricula (high, $M = 1.40$; low, $M = 2.99$; $p < .05$), whereas their attitudes toward sleeping fewer hours in a day (high, $M = 3.52$; low, $M = 3.11$; *ns*), raising student tuition (high, $M = 2.86$; low, $M = 2.65$; *ns*), and extending international boundaries at sea (high, $M = 3.48$; low, $M = 3.54$; *ns*) did not differ. Students high and students low in need for cognition were selected for Experiment 1 in part on the basis of their initial attitudes toward senior comprehensive exams to avoid confounding need for cognition with subjects' initial attitudes toward the recommendation, an effort that was accomplished successfully (see Footnote 2). This subsequent analysis of the attitude data from our preliminary test suggests, however, that the subjects classified as high or low in need for cognition who participated in Experiment 1 may not be entirely representative of their constituencies. In order to eradicate any concern about the validity of the results obtained in Experiment 1, a partial replication was conducted by using a recommendation toward which students high and those low in need for cognition felt equally antagonistic: raising student tuition. Strong and weak versions of a persuasive message were developed in pretests during the semester in which Experiment 2 was conducted. The responses of both students who scored high and students who scored low on the NCS were monitored in pretests to assure that the strong and the weak arguments were effective.

A second and important aim of Experiment 2 was to determine the effects of argument quality and need for cognition on attitudes toward the recommendation rather than toward the communication per se. Pretesting replicated previous surveys showing that students high and those low in need for cognition did not differ in their attitudes toward raising student tuition at their university, so only postcommunication measures of attitude were administered in Experiment 2. This allowed the data to be collected from each subject in a single session without the potentially obfuscating effects of having subjects specify their attitudes toward an issue, read a persuasive communication, and express their attitudes on the issue again.

Finally, data from subjects falling in the middle third of the distribution of scores on the NCS were deleted prior to analyses, so that, as in Experiment 1, we minimized the measurement error in classifying subjects as high or low in need for cognition.[4]

Method

Design and Procedure

One hundred ten female undergraduates participated in a 2 (Need for Cognition) × 2 (Argument Quality) factorial. Subjects were tested in groups of 8 to 16 in cubicles constructed so that no subject could have visual or verbal contact with any other subject, a condition making it possible to run all of the experimental conditions simultaneously.

Subjects were told that the Office of Student and Academic Affairs at the University of Iowa was reevaluating its policies and was seeking recommendations about possible changes. Subjects were told that policy statements had been prepared for possible broadcast and publication in the local media to inform and to obtain the reactions of people in the university community. Subjects were asked to read one of the policy statements, rate it for readability, and respond to the questions about the policy statement which followed it in their booklet.

Following the reading of this background material, subjects read either a strong or a weak set of arguments favoring

[4] The data from subjects whose scores on the NCS fell near the median were not analyzed in the initial tests of the hypothesis because post hoc analyses of the pilot studies suggested that subjects from a homogeneous population (e.g., from introductory psychology classes) whose NCS scores fell near the median responded to a variety of experimental tasks in a similar fashion whether their score was marginally above or below the median. It was assumed a priori that by deleting the data from these subjects in the present study, the responses to the persuasive communication attributable to need for cognition would be more apparent. As a follow-up of this reasoning, we conducted reanalyses, including the data from subjects scoring in the middle tripartite on the NCS as a group with moderate need for cognition, and found the same pattern of results, with a few F ratios involving the factor of need for cognition slightly reduced.

the recommendation that student tuition be increased at the University of Iowa, completed a dependent variable booklet, were debriefed, thanked, and dismissed.

Independent Variables

Need for cognition. The NCS was included last in the dependent variable booklet to allow for the subsequent selection of subjects who were high or low in need for cognition. Following the completion of data collection, subjects were ranked on the basis of their scores on this scale, and the data from those in the upper or lower tripartite were retained for analysis (see Footnote 4).

Argument quality. Though all subjects read an approximately 300-word message justifying the proposal that student tuition be increased, half of the subjects read a set of four strong arguments, and half read a set of four weak arguments. Briefly, in the strong version of the message, it was noted that despite increasing enrollments, inflation and interest rates were responsible for the erosion of the university's buying power, which had now reached its lowest level in 20 years. Second, it was stated that faculty and staff had already sacrificed a great deal in accepting small annual increases in salary. It was argued that several top faculty members, researchers, and creative artists had recently left the university for better paying positions at other universities (a well-publicized fact on campus) and that others were threatening to leave if their salaries were not maintained at levels at least comparable with those at other financially stricken peer universities. Third, statistics were cited indicating that the number of recruiting companies and the average starting salaries of undergraduates were a direct function of the prestige of the university granting their degree. The implications of an eroding financial base and the loss of quality faculty for the quality of teaching, the intellectual atmosphere at the university, and the prestige of the university were discussed briefly. Finally, it was noted that increasing undergraduate enrollments, coupled with the hiring freeze imposed on the university (at that time), had resulted in the overcrowding of classes and the reduction in the quality and diversity of instruction offered to students. Increasing student tuition was deemed a necessary means of dealing with these problems.

By contrast, in the weak message it was argued that the taxpayers of Iowa had been bearing the burden of higher education too long. It was suggested that tuition should be increased in order to take the unfair burden off taxpayers and place the burden on the shoulders of those who chose higher education as a priority in these financially difficult times. Second, it was stated that the multimillion-dollar sports arena under construction at their university had been funded primarily by contributions from residents and businesses in the state and that students would be the primary benefactors of the new arena. Hence, it was argued that state residents had already contributed significantly to students at the university and that students should contribute more to cover the cost of their own education. Third, it was argued that social programs, which were being cut by the federal government, were a more important priority for limited state resources (e.g., being of more use to the state residents) than was the university. It was noted that the average faculty salary was considerably higher than the average salary of a state resident "not on the government payroll" and that if students felt that quality faculty and staff were leaving for higher salaries at comparable universities, then the students should contribute the lion's share of the funds needed to keep faculty salaries on a par with those in peer institutions. Finally, it was reasoned that at least part of the money from tuition increases should be spent on improving the physical appearance of the university. It was suggested, for instance, that funds were needed to improve the roadways to and from the new arena to minimize the traffic congestion that was expected to accompany sports events at the university.

Dependent Variables

Attitude index. Immediately after reading the editorial, subjects read the following:

> Since your personal views on the desirability of the policy recommendation about which you read might influence the way you rate these materials, a measure of your own opinion is desired.

Subjects used four semantic differentials (good/bad, beneficial/harmful, wise/foolish, favorable/unfavorable) to indicate their own feelings about the recommendation to raise student tuition. Nine-point scales were used throughout the dependent variable booklet. In some scales the endpoint designating a positive response was labeled with a positive attribute (e.g., beneficial), and in some scales this endpoint was labeled with a negative attribute (e.g., foolish). Prior to analyses, responses to scales were transformed so that 1 signified a negative (or low level of an) attribute and 9 designated a positive (or high level of an) attribute. Each subject's responses to the attitude measures were averaged to form an attitude index.

Message evaluation. Subjects were asked to "rate the quality of the arguments used to support the policy recommendation" (1 = poor and unconvincing arguments, 9 = good and convincing arguments), which served as the measure of message evaluation.

Ancillary measures. Subjects' responses to two items embedded in the questionnaire were averaged to determine the extent to which the subjects felt the recommendation was personally important. These items were as follows: "How likely is it that the University of Iowa will institute the policy recommendation about which you read?" (1 = very unlikely, 9 = very likely); and "How personally relevant or important did you find the policy recommendation?" (1 = not at all relevant, 9 = very relevant). Subjects provided data on their impressions of the communicator by responding to the question "Regardless of how you felt about what the author had to say, how qualified did you think the author was to speak on the topic?" (1 = not at all qualified, 9 = very qualified). Finally, three items were included immediately following the attitude measure in order to maintain the cover story, assure that the strong and the weak sets of message arguments did not differ in their peripheral cue value, and ensure that the arguments were just as easy to comprehend and follow by subjects low as by those high in need for cognition. Subjects were asked to rate the readability of the policy statement they had read on scales labeled "difficult to understand/easy to understand," "hard to follow/easy to follow," and "contains complex structure/contains simple structure" (see Petty, Cacioppo, & Goldman, 1981). No differences were

Table 2
Ratings of the Persuasive Communication as a Function of Need for Cognition and Argument Quality

Variable	Low need for cognition		High need for cognition	
	Weak argument	Strong argument	Weak argument	Strong argument
Message evaluation	6.94_b	7.63_b	3.94_a	7.26_b
Qualification of source	6.38_b	6.00_b	4.18_a	6.42_b

Note. Means in a given row with dissimilar subscripts differ at $p < .05$ by the Duncan multiple-range test.

found on these items, and hence they are not discussed further.

Results

An ANOVA of message evaluation yielded the expected main effect for argument quality, $F(1, 70) = 18.32$, $p < .05$, a result indicating that the strong arguments were rated more positively ($M = 7.45$) than the weak arguments ($M = 5.49$). A main effect for need for cognition was also obtained, $F(1, 70) = 12.25$, $p < .05$, due to the fact that individuals high in need for cognition rated the message more negatively overall ($M = 5.69$) than individuals low in need for cognition ($M = 7.30$). These main effects were qualified by the expected Need for Cognition × Argument Quality interaction, $F(1, 70) = 8.70$, $p < .05$. A summary of pairwise comparisons by the Duncan multiple-range test are presented in Table 2. These tests revealed that, as in Experiment 1, argument quality had a larger impact on the evaluations of subjects high than of those low in need for cognition. This result again suggests that the former individuals scrutinized more the message arguments that were provided.

The analysis of the attitude index yielded a main effect for argument quality, $F(1, 70) = 27.53$, $p < .01$, which shows that the strong arguments were more persuasive ($M = 6.36$) than the weak arguments ($M = 3.93$) and a marginally significant Need for Cognition × Argument Quality interaction, $F(1, 70) = 3.54$, $p < .07$. In order to provide a more sensitive test of the specific experimental hypothesis, a contrast was calculated to test whether the difference between attitudinal responses to the strong and those to the weak message was larger for the high than for the low need for cognition group.[5] This directional contrast was significant, $t = 1.91$, $p < .03$, one-tailed (see Figure 2).

It is of interest to note that the pattern of means on the attitude measure was similar, though not identical, to that found for message evaluation ($r = .52$, $n = 74$, $p < .05$). We reasoned that if subjects high in need for cognition were more likely to derive their attitude through a considered evaluation of the arguments central to the recommendation, then there should be a stronger association between message evaluations and attitudes in subjects high than in those low in need for cognition. In order to evaluate this notion, a separate correlation was calculated between these measures in the high and the low need for cognition groups. As expected, this correlation was significantly larger in the high need for cognition group ($r = .70$, $n = 37$) than in the low need for cognition group ($r = .22$, $n = 37$; $Z = 2.68$, $p < .05$).

To further test the notion that it was the relative insensitivity of individuals low in need for cognition to variations in argument quality that determined their failure to show the attitude effects, we conducted two analyses of covariance (ANCOVAs). In the first, postcommunication attitudes served as the criterion measure, and message evaluation served as the covariate; in the second, message evaluation served as the criterion, and postcommunication attitudes served as the covariate. The results revealed that the significant Need for Cognition × Argument Quality interaction for message evaluation remained significant when attitudes served as the covariate, $F(1, 68) = 5.24$, $p < .03$, whereas any hint of a significant Need for Cognition × Argument Quality in-

[5] This contrast was based on past research focused on the effects of argument quality and situational factors (e.g., distraction, issue involvement). A recent review of this research can be found in Petty and Cacioppo (1983).

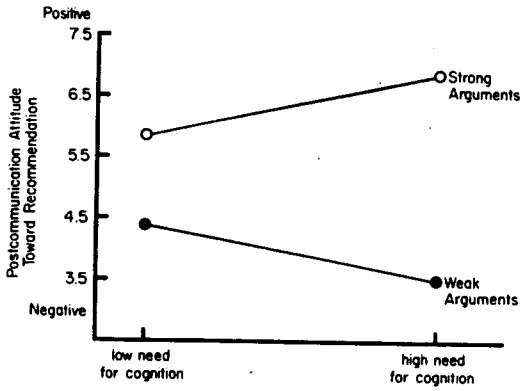

Figure 2. Postcommunication attitudes as a function of argument quality and need for cognition.

teraction on the attitude measure was eliminated ($F < 1$) when the measure of message evaluation served as the covariate. The results of these analyses too are consistent with the view that need for cognition affects message processing and thereby affects people's susceptibility or resistance to persuasion.

Analyses of subjects' ratings of how personally involving was the recommendation yielded one main effect. Subjects rated the recommendation as more involving after reading the strong ($M = 3.08$) than after reading the weak ($M = 1.78$) version of the message, $F(1, 70) = 9.12$, $p < .01$. Finally, analyses of the subjects' ratings of the qualifications of the communicator revealed that the Need for Cognition × Argument Quality interaction was replicated, $F(1, 70) = 5.75$, $p < .05$. As in Experiment 1, the impressions formed by individuals high, but not low, in need for cognition about the communicator were affected by argument quality (see Table 2). No other test was significant.

General Discussion

We began the present investigation with three observations: (a) A premise in many social psychological theories, and particularly in many theories of attitude change, is that people commonly deliberate about information in their social environment (cf. Insko, 1967; Shaw & Costanza, 1982; West & Wicklund, 1980); (b) persuasive communications are so pervasive that people cannot think extensively about all to which they are exposed (Miller, Maruyama, Beaber, & Valone, 1976; Petty & Cacioppo, 1981); and (c) recipient factors, such as those described by Cohen et al. (1955), Murray (1938), Murphy (1947), and other early personality and social psychologists, may be predictive of the extent to which externally provided arguments for a recommendation are scrutinized. The present investigation was designed to explore this third postulate.

Social psychologists have long noted that there are not only situational factors that affect people's tendencies to deliberate about information from their social environment but also dispositional factors that govern the likelihood that individuals will scrutinize social information (cf. Maslow, 1943; Murphy, 1947; Murray, 1938). Indeed, it is noteworthy in retrospect that early evidence for the third postulate listed above can be found in the first (and, heretofore, the only) experiment published on the relation between need for cognition and persuasion (Cohen, 1957). In Cohen's study, 35 undergraduates indicated their attitudes toward instituting the stricter scoring procedure of grading on a curve, and each student's level of need for cognition was measured. Approximately 1 month later, the students were introduced to a communicator who was described as a faculty member who had recently chaired the departmental committee investigating grade inflation at their university. Students were told that he was there to speak about the current grading problem at the university and to obtain their views on the problem. About half of the students heard the communicator outline the grading problem and then provide information about how grading on the curve was a judicious solution; the remaining students heard the arguments for grading on the curve before the grading problem was described. Cohen reasoned that outlining the problem prior to providing the possible solution would result in more attitude change than the reverse order of presentation; he also reasoned that subjects high in need for cognition would be more motivated than their counterparts to think about the issue and, consequently, would evidence a weaker order of presentation effect following a short delay. His results supported both predictions.

The present studies extend Cohen's observations in several important respects. Message evaluation was examined in Experiments 1 and 2, recall was obtained in Experiment 1,

impressions of the communicator were collected in Experiments 1 and 2, and postcommunication attitudes were assessed in Experiment 2. Various topics, messages, and measures have been used in these studies, and the need for cognition of subjects was assessed in a purportedly unrelated investigation in Experiment 1 and at the conclusion of Experiment 2. For all these variations, the patterns of results are quite consistent. The manipulation of argument quality had a larger impact on the message evaluations, impressions of the communicator, and attitudes of individuals high in need for cognition than of those low in need for cognition. Individuals high in need for cognition also recalled more message arguments from both the strong and the weak versions of the message, and they reported expending more cognitive effort in deliberating about the message to which they were exposed than did their counterparts. Moreover, the correlation between message evaluation and postcommunication attitudes was significantly higher for individuals high than for those low in need for cognition, and statistical analyses to examine the causal sequence of message evaluation and attitudes supported the notion that the scrutiny and evaluation of the message influenced postcommunication attitudes rather than vice versa. Finally, it should be noted that in a study in which we used audiotapes rather than printed communications, we again found that subjects high, in contrast to subjects low, in need for cognition provided more discriminating evaluations of the strong and weak versions of the message arguments and recalled more message arguments regardless of their quality (see review by Cacioppo & Petty, in press). Collectively, these data suggest that individuals high in need for cognition are more likely to extract information from and think about externally provided message arguments than individuals low in need for cognition.

There are several limitations that should be noted, however. Need for cognition may constitute one factor that affects the likelihood that an individual will deliberate about the merits of the arguments for a recommendation, but we do not mean to suggest it is the only, or perhaps even the most important, factor. Situational factors are particularly powerful determinants of individuals' motivation and ability to consider the meaning, implications, and nuances of persuasive arguments (cf. Petty, Cacioppo, & Heesacker, in press). Moreover, other dispositional factors, such as intelligence (cf. McGuire, 1968) or cognitive development (Inhelder & Piaget, 1958; cf. Neimark, 1982), may also prove to be predictive of elaboration likelihood in persuasion contexts. It has been our working assumption that need for cognition represents a motivational tendency which, though not invariant, develops through an individual's experiences with complex cognitive endeavors and, for the most part, reflects the intrinsic rewards the individual derives from these types of efforts. Intelligence, in contrast, may perhaps best be viewed as an ability factor that delimits the boundaries of an individual's deliberations. The factor of prior knowledge about an issue, at least if experimentally manipulated, may function as yet another, more limited ability factor governing the extent to which an individual can think about and elaborate on arguments for a recommendation (e.g., Cacioppo & Petty, 1980; cf. Wood, 1982). Therefore, need for cognition is viewed here as a contributory rather than a necessary or sufficient cause for the likelihood of high elaboration.

It may be questioned whether individuals high and those low in need for cognition differ in terms of their general intelligence. To assess this, we administered the NCS and the Shipley-Hartford (1940) scale to more than 100 undergraduates drawn from the same subject population that was employed in this research. The results revealed that need for cognition was unrelated to both abstract reasoning ($r = -.03$) and verbal reasoning ($r = .15$). In a subsequent replication by Morris, Bachman, Bromwell, and Sterling (Note 3), again involving more than 100 students, need for cognition was again found to be unrelated to abstract reasoning ($r = .12$) and weakly related to verbal reasoning ($r = .21$). Hence, although it is reasonable that more intelligent individuals are more likely to experience success in difficult cognitive endeavors and, therefore, come to be characterized by high levels of need for cognition, there appear to be at most only small differences in intelligence between individuals who are classified as high and those who are classified as low in need for cognition in *this* subject population.

Although further research in which measures of need for cognition and mental abilities are both obtained would be informative, it seems unlikely that the small potential differences in intelligence between individuals classified as high and those classified as low in need for cognition could account for the obtained differences in message evaluation, source evaluation, reported cognitive effort, and attitude change. Eagly and Warren (1976) found that verbal intelligence could influence both a recipient's ability to understand a message and his or her susceptibility to persuasion. In their study, subjects high, in contrast to those low, in intelligence understood and tended to agree more with complex arguments, whereas the opposite pattern emerged for simple arguments. In Experiment 2 of the present research, we specifically asked subjects to rate how easy or difficult the message was to understand, how easy or difficult it was to follow, and the extent to which the message was characterized by a simple or a complex structure. No differences were found on any of these measures, results suggesting that the high- and the low-need-for-cognition subjects were equally able to understand and follow the message arguments.

A second caveat concerns the generalizability of these data. In these studies, including Cohen's (1957) study, students were confronted with relatively involving, counterattitudinal appeals. As the perceived personal importance of a recommendation decreases, people tend to move from careful deliberations of the merits of the arguments for a recommendation to simpler, less cognitively taxing means of evaluating the recommendation (Cacioppo & Petty, 1980; Chaiken, 1980; Petty & Cacioppo, 1979, in press; Petty et al., 1981; Petty, Cacioppo, & Schumann, in press). It is only reasonable that lowering issue involvement would reduce the elaboration likelihood of both individuals high and those low in need for cognition, though at any given level of issue involvement it is individuals high in need for cognition who should think more about an issue. However, exceptions to this principle should include appeals that are so important that individuals high and those low in need for cognition would think as much as possible about them and appeals that are so unimportant that neither group would think about them.

Finally, this research raises several questions about the relation between need for cognition and yielding. The data suggest that individuals high in need for cognition are more likely to think about the arguments presented when deriving their attitudes toward an issue, but it is not clear from these studies whether they would also think more about variations in peripheral cues. Petty et al. (1981) exposed subjects to either strong or weak persuasive arguments emanating from either an expert or an inexpert source. In addition, the advocacy was presented to some subjects as being personally consequential and to others as being inconsequential. The results showed that the attitudes of subjects who believed that the recommendation would affect them personally were influenced by the quality of the arguments presented in support of the recommendation, whereas the attitudes of subjects who believed the advocacy was not particularly involving were influenced by the expertise of the source rather than the quality of the arguments. Similarly, Petty and Cacioppo (in press) demonstrated that message factors such as the apparent number of arguments supporting a recommendation could also serve as a persuasion cue (e.g., the more arguments, the better the recommendation) when more obvious cues were held constant across conditions. Subjects were exposed to a set of either three or nine arguments that were either strong or weak in quality. In addition, half of the subjects believed that the recommendation was personally important, and the remaining subjects believed that it was unimportant. As expected, the attitudes of subjects who believed the recommendation was involving were determined by the quality of the arguments presented, whereas those of the remaining subjects were determined by a feature of the appeal that was apparent following a more superficial analysis of the persuasive communication: the simple number of arguments.

These data, which were obtained in response to the manipulation of situational factors in the persuasion context, support the existence of central and peripheral persuasion processes (see Petty & Cacioppo, 1981). It remains for future research to determine exactly how the

dispositional factor of need for cognition bears on our analysis of persuasion, however. Subjects low in need for cognition, for example, may be more likely to travel the peripheral route to persuasion because, in their effort to derive a "reasonable" position on the issue while minimizing the expenditure of cognitive resources, they utilize obvious cues in the persuasion context (e.g., the "apparent" number of arguments for the recommendation). It is also possible, however, that individuals low in need for cognition are less likely to think about changes in superficial as well as substantive features of a persuasive appeal, and this would make them no more likely to travel the peripheral route to persuasion than individuals high in need for cognition.

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