

4.3 Group Size Effects on Cognitive Effort and Attitude Change

Richard E. Petty *University of Missouri-Columbia*

John T. Cacioppo *University of Iowa*

and

Stephen G. Harkins *Northeastern University*

Although the study of attitudes and persuasion has long been viewed as a central focus of social psychology (Allport, 1935), relatively little attention has been paid to two basic features of the persuasion situation—the number of people receiving a persuasive message, and the number of people delivering a communication.¹ The typical analysis of social influence considers one source presenting a message to one recipient, and the *number* of sources and recipients has not been viewed as an important factor on its own. This lack of systematic attention to group effects by persuasion researchers is unfortunate given the large number of naturalistic situations in which we are in the company of others when exposed to persuasion attempts, and are the targets of persuasion by multiple sources. For example, at political rallies, numerous speakers advocate the same position to a large group of people whose individual opinions will be combined (on election day) to determine the outcome. In the criminal justice system, multiple witnesses testify about the character of a defendant to a group of people who must form a collective judgment. In this paper, we present a brief outline of a program of research we have initiated on the effects of presenting a message to multiple recipients rather than to just one, and then we address the effects of receiving a message from multiple sources rather than from just one.

Number of message recipients

As we noted above, when a juror listens to the persuasive evidence presented in a courtroom, he or she knows that there are 11 other people who are listening to and evaluating the same evidence. When a person listens to a political candidate make a speech on television, he or she knows that there are millions of others who are also listening to and evaluating the same speech. What is the effect of knowing

that the responsibility for evaluating a persuasive message is shared with others? The only experimental research directly relevant to the effects that the number of message recipients have on persuasion that we have located was conducted by Knower almost half a century ago. Knower (1935, 1936) reported that oral and written presentations were more persuasive when they were presented to individuals than when presented to groups. These findings have neither been replicated nor adequately explained. Much more recently, Latané (1976) and Newton and Mann (1980) reported correlational investigations of naturally formed crowds of different sizes and persuasion. In these studies, increasing crowd size was sometimes associated with enhanced and sometimes with diminished persuasion. Of course, in these naturalistic correlational investigations, crowd size may be confounded with many other variables (e.g. weather, speaker enthusiasm, etc.), and thus interpretation is rather difficult.

Even though there has been relatively little attention to how the number of message recipients affects persuasion, there has been a considerable amount of research on how the number of people available to perform some *physical task* affects performance on that task. A brief review of this research will be instructive.

Group size and physical tasks

There is now considerable evidence that in many situations in which a group is responsible for a physical task, the real or perceived presence of other people produces *social inhibition*. That is, people are less likely to respond, or respond with less effort than they would have if they had been alone. Perhaps the most well-known social inhibition effect is Latané and Darley's (1970) demonstration that the real or implied presence of other people inhibits individuals from rendering help to a victim in distress. This social inhibition effect is not limited to emergency situations, however. Later research has documented that when other people are present or available to respond, individuals are less likely to help pull hard on a rope (Ingham *et al.*, 1974), shout or clap loudly upon request (Latané *et al.*, 1979; Harkins *et al.*, 1980), pick up coins in an elevator (Latané and Dabbs, 1975), or answer an intercom for someone else (Levy *et al.*, 1972).

Interestingly, this social inhibition effect is not confined to situations in which one's physical efforts are aimed at helping someone else. To see if social inhibition might also operate when the physical effort required by a task might help oneself, Petty *et al.* (1977b) gave elevator riders an opportunity to help themselves to a coupon redeemable for a free sandwich at a local fast-food restaurant. The coupon was revealed to riders as the elevator doors closed, and was attached to a large sign that said 'FREE McDONALD'S BURGER'. Riders were free to help themselves to the coupon during their brief ride in the elevator. After they left the elevator, an experimenter would board, record whether the coupon was gone, and attach another coupon if necessary.

Of the 56 people who entered the elevator alone, 26 were randomly allowed to ride by themselves, 16 were joined by an informally dressed student (confederate), and 14 were joined by 2 confederates. When the coupon came into view, the confederate(s) looked at the free offer, but did not react. Single individuals were far more likely to help themselves to the coupon (81%) than were people who rode with either one (38%) or two (14%) other people. The response rates of individuals with one or two confederates present, though not differing ($p > .20$), were both significantly lower than those of riders who were alone ($ps < .01$).

Although these results are consistent with the view that social inhibition occurs even in situations in which the physical response brings an immediate reward to oneself, these results may have also been obtained in part because subjects in groups wanted to avoid taking the only coupon and thus avoid appearing selfish to the other rider(s). To see if the social inhibition effect would also emerge when the latter process could not operate, a second experiment was conducted. In this second study, two coupons were clearly visible when the elevator doors closed. Fourteen riders were randomly allowed to ride by themselves, and 13 were joined by a confederate. Overall, 86% of those individuals who were alone took at least one coupon, with 43% helping themselves to both. In comparison, only 31% of those with one other person present helped themselves to even one coupon, and no one took two, $\chi^2(1) = 8.4, p < .01$. These data are very similar to the comparable proportions of 81% and 38% obtained when there was only one coupon, and suggest that the social inhibition effect does not appear to be due to subjects not wanting to appear selfish to the other riders. Selfishness is not an issue in the second study because riders in pairs could have taken one coupon, leaving the other for their fellow rider.

Clearly then, the research that we have briefly summarized above indicates that across a wide variety of situations, persons appear to inhibit or reduce their physical responses when they are members of a group faced with a physical task. It is reasonable to suspect, therefore, that *cognitive* responses might likewise be inhibited when people are members of a group faced with an effortful cognitive task.

Group size and cognitive tasks

Experiment 1

To provide an initial test of the hypothesis that group responsibility for a cognitive task inhibits the cognitive effort devoted to the task, Petty *et al.* (1977a) asked undergraduates to evaluate a poem and an editorial ostensibly written by fellow students. The student evaluators were led to believe that they were either the only one, one of four, or one of 16 evaluators. All subjects actually read the same two communications, and after exposure to each stimulus were asked three questions designed to measure their perceived effortful involvement in the task (e.g. to what

extent were you trying hard to evaluate the communication?), and four questions designed to provide a general measure of attitude toward the communication (e.g. to what extent did you like the communication?). Scores on the first set of questions were summed to form a general 'effort index,' and scores on the second set of questions were summed to form a general 'attitude index.'

The results from this study were quite straightforward. Individual evaluators reported putting more effort into evaluating the communications than did group evaluators ($F(1, 72) = 4.65, p < .05$) who did not differ according to group size. These data indicate that persons in groups felt less compelled to work at assessing the communications than individuals and provide support for our hypothesis that group responsibility for a cognitive task inhibits cognitive effort. The general attitude measure revealed that individuals who thought that they alone were responsible for rating the communications were significantly more favorable toward them than evaluators who thought they were rating in groups ($F(1, 72) = 6.01, p < .05$) which again did not show a significant difference according to size. Furthermore, a significant within-cell correlation between the perceived effort index and the general attitude index ($r = +.48, p < .01$) suggested that the enhanced effort of individual over group evaluators may have directly contributed to the enhanced attitude ratings that individual evaluators provided for the communications.

There are several theoretical mechanisms that might account for the relationship between effort and evaluation (e.g. commodity theory—Brock, 1968; deindividuation theory—Zimbardo, 1970). One of the most developed is Jones and Gerard's (1967) 'effort justification' hypothesis derived from Festinger's (1957) dissonance theory. This formulation states, 'If a person expends effort that is not readily justified by the amount of reinforcement received, he tends to create reinforcements out of the stimuli in the immediately surrounding environment' (p. 89). Thus, individual evaluators may have justified their increased efforts by overvaluing the communications (see also Cohen, 1959; Wicklund *et al.*, 1967).

An alternative explanation would contend that increasing cognitive effort accentuates the perceived features of a stimulus, leading to discovery and increased liking of a good communication's virtues and disliking of a poor communication's flaws. In a series of studies on basic persuasion processes, we have shown that by either increasing a person's motivation (Petty and Cacioppo, 1979a, 1979b) or ability (Cacioppo, 1979; Cacioppo and Petty, 1979) to think about a persuasive message, more polarized attitudes result. Specifically, we have shown that with greater ability and/or motivation to process the arguments in a communication, more favorable thoughts are generated to high quality arguments yielding more positive evaluations, but more unfavorable thoughts are generated to low quality arguments yielding more negative evaluations (see Petty and Cacioppo, 1981, Chs. 8 and 9 for a review). In our initial investigation on the effects of number of evaluators on cognitive effort and attitudes (Petty *et al.*, 1977a), group evaluators liked the communications (i.e. rated them above the

midpoint on the attitude scales) and individual evaluators liked them even more. This is the result that would be expected if individual evaluators were motivated to do more thinking about the positive stimuli than group evaluators were.

Experiment 2

In order to assess these various alternative explanations, Petty *et al.* (1980) conducted a second experiment on group size and attitudes. In this experiment, all subjects were told that their task was to evaluate critically an editorial. The subjects, all university students, were led to believe that they were assisting the journalism school at their university evaluate its programs by providing peer feedback on the writing abilities of students in the school. Subjects were told either that they were the only person who would evaluate the editorial or that they were 1 of 10 people who would evaluate the editorial. Thus, some subjects believed that they bore the full responsibility for the evaluation, whereas others believed that they shared the responsibility with other members of a group.

Subjects read one of three editorials. Each message argued that seniors be required to pass a comprehensive exam in their declared major prior to graduation, but the editorials differed in their presentation of eight key arguments. One message was designed to contain points that were logically sound, defensible, and compelling (strong arguments message). These arguments (e.g. schools with the exams attract larger and more well-known corporations to recruit students for jobs) were shown in a pretest to elicit primarily favorable thoughts. A second message contained arguments that were designed to be more open to refutation and skepticism (moderate arguments message). These (e.g. adopting the exams would allow the university to be at the forefront of a national trend) were shown to elicit a mixture of unfavorable and favorable thoughts in a pretest. The third message contained arguments that were quite easy to counterargue and was designed as an extremely negative stimulus (weak arguments message). These arguments (e.g. the risk of failing the exam was a challenge most students would welcome) elicited primarily unfavorable thoughts in a pretest.

After reading the appropriate message, subjects completed the same communication evaluation measures as employed in the initial experiment, and the same perceived effort measures. In addition, subjects were given $2\frac{1}{2}$ minutes to list the thoughts that occurred to them while reading the editorial. This measure was employed to reflect the 'actual' in contrast to the 'perceived' amount of cognitive effort expended in the task (see Cacioppo *et al.*, 1981). After subjects had listed their thoughts, they were instructed to go back and rate their ideas as + (something favorable or good about the editorial), - (something unfavorable or bad about the editorial) or 0 (neither in favor of nor opposed to the editorial).

The major results from this study are presented in Table 1. As in the first experiment, subjects who believed that they were the only evaluator of the editorial reported more cognitive involvement with the task on the 'perceived

Table 1 Effects of group size and editorial quality on cognitive effort and editorial evaluation

Measure	Strong arguments		Moderate arguments		Weak arguments	
	Individual	Group	Individual	Group	Individual	Group
Perceived effort index	8.81 _a	7.63 _b	7.81 _{ab}	7.04 _b	8.58 _a	8.10 _{ab}
Unfavorable thoughts	.86 _a	1.40 _a	1.90 _{ab}	1.86 _a	3.80 _c	2.53 _b
Favorable thoughts	3.76 _a	2.83 _b	2.00 _b	2.20 _b	.96 _c	1.76 _{bc}
Communication evaluation index	9.30 _a	7.64 _b	6.83 _b	7.17 _b	4.03 _c	5.85 _d

Note Means in the same row without a common subscript are significantly different at the .05 level by the Newman-Keuls procedure. Table adapted from Petty *et al.* (1980).

effort index' ($M = 8.4$) than did subjects who believed that they were 1 of 10 evaluators ($M = 7.6$), $F(1, 168) = 9.66$, $p < .002$. Importantly, significant main effects for the Argument Quality manipulation on the measures of favorable thoughts $F(2, 168) = 20.08$, $p < .001$, and unfavorable thoughts, $F(2, 168) = 23.02$, $p < .001$, attested to this manipulation's success. Subjects generated the most favorable thoughts to the strong arguments ($M = 3.3$), next most to the moderate ($M = 2.1$), and least to the weak arguments ($M = 1.3$). Similarly, subjects generated the most unfavorable thoughts to the weak arguments ($M = 3.2$), next most to the moderate ($M = 1.9$), and least to the strong arguments ($M = 1.1$). In addition to these main effects on the thought production measures, two significant Group Size \times Argument Quality interactions ($ps < .05$) emerged. These interactions indicated that increasing the number of evaluators inhibited the production of unfavorable thoughts to the weak message, and inhibited the production of favorable thoughts to the strong message.

The pattern of results on the measure of attitude toward the communications followed the thought measures quite closely. A main effect for the Argument Quality manipulation, $F(2, 168) = 59.93$, $p < .001$, revealed that subjects reading the editorials with strong arguments provided the most favorable evaluations ($M = 8.5$), followed by subjects reading the moderate arguments ($M = 7.0$), and then subjects reading the weak arguments ($M = 4.9$). Of most interest, however, was a significant Group Size \times Argument Quality interaction, $F(2, 168) = 16.11$, $p < .001$, which clearly indicated that individual evaluators had more favorable attitudes toward the strong argument editorial but less favorable attitudes toward the weak editorial than did group evaluators. The group size manipulation had no effect on attitudes toward the moderate editorial.

Finally, an analysis of the average within-cell correlations among the attitude and cognitive effort measures indicated that within the strong message cells, the more cognitive effort subjects perceived themselves to exert, the more favorably

they evaluated the editorial ($r = +.43, p < .05$), but within weak message cells, the more cognitive effort subjects perceived themselves to exert, the less favorably they evaluated the editorial ($r = -.34, p < .05$). The pattern within all cells was that the more favorable thoughts actually generated by subjects, the more positively they evaluated the editorials ($r = +.35, p < .05$), and the more unfavorable thoughts they generated, the more negatively they evaluated the editorials ($r = -.40, p < .05$).

Limitations and implications

The results of the two studies we described above provide clear support for the view that group responsibility for a cognitive task can lead to an inhibition of cognitive effort on that task. Both experiments showed that group evaluators reported less cognitive involvement in the task on a measure of *perceived* cognitive effort, and Experiment 2 showed that group evaluators *actually* generated fewer thoughts consistent with the quality of the stimulus than did individual evaluators. People are apparently less willing to engage in effortful cognitive activity when they share the responsibility for a task with others than when they alone are responsible for the cognitive work. This may provide one explanation for why numerous political surveys show that voters are often quite uninformed about important national issues (Campbell *et al.*, 1964). When millions are responsible for making a collective decision about whom to elect for President, each individual bears only a small fraction of the responsibility for evaluating the candidates, and thus individual cognitive effort is minimal.

The two studies on group size and cognitive effort also indicated how cognitive effort is translated into an overall evaluation or attitude. Specifically, attitudes were tied to the amount of cognitive effort expended and the quality of the stimulus to be evaluated. The more cognitive effort expended, the more favorable the evaluation when the stimulus was of high quality, but the more negative the evaluation when the stimulus was of low quality. The added cognitive effort expended by individual evaluators apparently renders them better able to discover and appreciate the virtues of a positive stimulus and the flaws of a negative one. This finding, of course, suggests that the link between cognitive effort and evaluation is a result of information processing activity rather than dissonance reduction.²

We suspect that several of the conditions found in our two studies are necessary for group diffusion of cognitive effort to occur: the task should be clearly identified as a cooperative group project and involve costly effort, responsibility should inhere in the group as a whole and not in specific members, rewards to individuals should not be contingent on identifiable individual output, and group interaction should be minimal. When group interaction is permitted, other processes may become important. For example, the sharing of information in a group can lead group evaluators' opinions to become more *extreme* than the

initial opinions of the individuals composing the group (see Burnstein and Vinokur, 1977). This group polarization phenomenon, of course, provides a direct counterpoint to the group moderation phenomenon (group evaluators expressing less extreme evaluations of a stimulus than individual evaluators) that we have described above. It appears that knowing that a group will have responsibility for an ultimate decision leads to opinion moderation in the stage of opinion formation (because group evaluators are less diligent in thinking about the stimulus to be evaluated), but actual group discussion may lead to opinion polarization (because group members share information and arguments they have individually generated). Some group decisions occur without much formal discussion among group members (e.g. election decisions) and thus cognitive inhibition and opinion moderation may be the prepotent process, but many other group decisions involve both an initial information gathering and opinion formation stage prior to discussion, and then an actual group discussion (e.g. jury decisions). In these situations, both processes will operate in direct conflict such that the larger the group that is assigned responsibility for the task, the greater the likelihood for moderation of opinion prior to discussion, but the greater is the likelihood for polarization as a result of the discussion.

Number of message sources

Just as there are many real-world situations in which groups rather than individuals are responsible for evaluating a persuasive advocacy, there are many situations in which an advocacy on a particular subject is received from several sources rather than just one. There are numerous reasons to suspect that the more people who advocate a particular view, the more persuasion that will result. First, it has been well documented that *conformity* pressures increase simply as a result of learning that others endorse a contrary view even if the reasons for the endorsements are not known (e.g. Asch, 1951; Krech *et al.*, 1962; White, 1975). Generally, conformity is thought to occur because of the implicit assumption on the part of conformers that behaving like others will elicit approval, whereas dissimilar behavior will bring about negative consequences (Allen, 1965; Kiesler and Kiesler, 1969). Another reason that multiple sources might produce more persuasion than a single source in naturalistic contexts is that multiple sources might generate more arguments than a single source, and research indicates that increasing the number of arguments associated with a position enhances agreement with that position (e.g. Calder *et al.*, 1974; Insko *et al.*, 1976). Finally, exposure to multiple sources might lead to the repetition of certain arguments. A moderate number of repetitions of relatively complex arguments appears to enhance their persuasiveness (e.g. Cacioppo and Petty, 1979, 1980). Since we were interested in whether there were any persuasive effects of multiple sources that did *not* depend on conformity pressures, multiple arguments, or message repetition, we designed an exploratory study that allowed independent assessment of these processes.

Experiment 1

In the initial study, Harkins and Petty (1981) told university students that a faculty committee was soliciting student opinions on the institution of senior comprehensive exams at their university. All of the students were told that the investigators had recently videotaped three students who were asked to give three of their thoughts about the proposed exams. All subjects were told that the first three students who were videotaped favored the exam idea, and that they would be shown a short randomly selected portion of the tapes made so far to obtain their reactions. Subjects then saw a brief segment of videotape in which either (a) one source presented one argument, (b) three different sources presented variations of the same basic argument, (c) one source presented three different arguments, or (d) three different sources gave three different arguments (one each). The segments were constructed from a master tape consisting of three males, each of whom gave three arguments in favor of the exams. Although each speaker made each of the three arguments on the master tape, each speaker's version of the argument was somewhat different.³ The selection of speaker, argument, pairing of speaker and argument, and order of presentation was determined randomly in the appropriate conditions. Each subject saw a different randomly determined segment of videotape constructed in this way.

In addition to these four experimental conditions, two control conditions were conducted. In the *conformity-control* group, subjects read the same instructions as subjects in the experimental groups, but were told that we would like to have them answer a few questions *prior* to viewing the videotape. They, in fact, never saw the tape since this condition was designed to assess the effects of simply knowing that three fellow students who were in favor of the exams had each generated three arguments to which they might be exposed. In the *no-information* control group, the subjects simply read a brief description of the comprehensive exam proposal and were asked for their opinions on it. These subjects were unaware of the existence of the three students who generated three arguments.

To measure subjects' own attitudes about the comprehensive exams, all of them responded to four 9-point semantic differential scales (e.g. good/bad) on which they rated the exam proposal, and to one 11-point scale on which they rated their extent of agreement with the proposal. These responses were converted to standard scores and averaged to form a measure of attitude toward the position advocated in the editorial. In addition, subjects were given 2½ minutes to list their thoughts about the exam proposal, and they responded to several ancillary questions.

The major results from this study are presented in Table 2. An analysis of the standardized attitude measure revealed a significant effect for experimental condition, $F(5, 96) = 15.4$, $p < .01$. A Newman-Keuls analysis on this measure showed the following. First, students in the conformity control condition expressed significantly more agreement with the comprehensive exam proposal than students in the no-information control condition. This indicates that simply

Table 2 Effects of multiple sources and multiple arguments on attitudes and thought generation

Experimental condition	Attitude	Favorable thoughts
Three sources—three arguments	1.88 _a	3.75 _a
Three sources—one argument	.30 _b	2.20 _b
One source—three arguments	.04 _b	1.85 _b
One source—one argument	.03 _b	1.50 _b
Conformity control	.12 _b	1.95 _b
No-information control	-2.38 _c	.70 _c

Note Means in each column without a common subscript are significantly different at the .05 level by the Newman-Keuls procedure. Attitudes are expressed in standardized scores. Table adapted from Harkins and Petty (1981).

knowing that others have endorsed the proposal was sufficient to increase agreement even though no arguments were actually heard (a conformity effect). The experimental cells provide information about the effects of actual exposure to the multiple sources and arguments. Subjects in all of the experimental cells showed significantly more agreement with the exam proposal than subjects in the no-information control group, but subjects in only one of the experimental groups showed more agreement than subjects in the conformity control condition—multiple sources presenting multiple arguments. The enhanced persuasion in this group cannot be attributed to the information included in the arguments alone, to the number of speakers alone, nor to the simple additive combination of these factors, since neither arguments nor speakers manipulated singly resulted in reliably more persuasion than a single speaker presenting a single argument, $p_s > .20$. The 2 (one or three arguments) \times 2 (one or three sources) interaction contrast suggested by this non-additive pattern of means was reliable, $F(1, 96) = 5.07, p < .05$.⁴

Harkins and Petty suggested that there were two viable interpretations for the multiple source—multiple argument effect. One explanation contends that subjects in the different experimental conditions made differential attributions about the number of good arguments that existed in support of comprehensive exams. That is, the knowledge that several sources each independently generated different, yet convincing arguments may have led subjects to infer that there was a large pool of reasonable arguments in favor of the exam proposal. This inference might lead to enhanced agreement since if a large number of reasonable proarguments exist, the proposal must be worth supporting. A second plausible interpretation would contend that subjects in the multiple source—multiple argument condition devoted more cognitive effort to evaluating the message than subjects in the other conditions, and that this enhanced thinking led to more polarized attitudes. This

interpretation argues that each time a new source is introduced, the subject 'gears up' to process the message. If it is a new speaker, and a new argument, the recipient thinks about the argument's implications. However, if the same speaker appears again, even though with new arguments, the recipient puts minimal effort into processing the argument because this source has been heard already. Likewise, if new speakers are presented, but all give the same relatively simple argument, little additional thought takes place, because the recipient has heard this argument already. Consistent with this reasoning, Harkins and Petty found that subjects in the multiple source-multiple argument condition generated more favorable thoughts about the issue than subjects in any other condition (see Table 2).

Experiment 2

A second experiment was conducted to assess the two viable accounts for the multiple source-multiple argument effect. All subjects in this study were told that 100 students had been videotaped giving their opinions about raising the driving age to 21, and that 91% of the students favored the proposal. As in the first experiment, subjects were told that they would view a randomly selected sample of the videotapes. Three experimental conditions were constructed. In one condition, subjects saw one fellow student present four cogent arguments for raising the driving age. In a second condition, subjects saw four different students each present a different argument for raising the driving age. This condition replicates the multi-speaker, multi-source condition of the previous study. Finally, a third group of subjects saw four different students each present a different argument, but these subjects were told that 'although there were different wordings, when we boiled down all of the arguments generated by the 100 students . . . we found that there were essentially four different favorable arguments . . . you will hear all four.' Thus, the argument pool was specified at four arguments for these subjects. After viewing the appropriate videotape, subjects completed measures similar to those described in the previous experiment.

If the argument pool interpretation of the multiple source-multiple argument effect is correct, then subjects who see multiple persons deliver multiple arguments but think that these arguments exhaust the pool should be no more persuaded than subjects who see only one speaker deliver these four arguments. In fact, they might even be less persuaded since subjects who see only one speaker believe that the *lower* limit on the argument pool is four. On the other hand, the cognitive effort interpretation would expect that specifying the size of the argument pool would not eliminate the effect since enhanced processing in the four-speaker, four-argument case should still occur, even if the arguments presented exhausted the argument pool.

The results of this study favored the cognitive effort hypothesis. The extent of agreement with raising the driving age to 21 was the same in both conditions

where four speakers were heard ($F < 1$) even though subjects had differential perceptions about the number of good arguments that existed in support of the driving age proposal. Of subjects in the condition where the argument pool was specified, 80% believed that five or fewer good arguments existed in support of the proposal, whereas only 35% of subjects in the other two conditions believed this. Also, consistent with the cognitive effort hypothesis, the four-speaker conditions produced significantly more agreement than the one-speaker condition, $F(1, 27) = 9.10, p < .05$. The measure of favorable thought generation showed that subjects hearing four speakers present the four arguments generated more positive thoughts ($M = 1.85$) than subjects hearing one speaker present the same four arguments ($M = .4$), $F(1, 27) = 8.4, p < .05$. This pattern of results argues strongly against the argument pool interpretation.

Experiment 3

One interesting implication of the cognitive effort interpretation of the multiple-source, multiple-argument effect is that if the arguments presented by multiple sources were weak rather than compelling, there would be less persuasion the more speakers who endorsed the proposal. In a test of this hypothesis, Harkins and Petty (1981) had subjects read three compelling arguments about the senior comprehensive exam issue that were attributed to either one or three people, or three weak arguments that were attributed to one or three people. The same cover story used in Experiment 1 was employed, and as in the other studies, background information about the number of people and arguments that existed in support of the advocacy was held constant. The same dependent measures as employed in the previous studies were also used.

A significant Argument Quality \times Number of Sources interaction on the attitude measure, $F(1, 96) = 11.1, p < .001$, provided strong support for the cognitive effort hypothesis. As predicted, subjects exposed to three compelling arguments purportedly produced by three different people expressed more agreement with the exam proposal ($M = 1.08$) than subjects who read the same high-quality arguments presumably generated by one person ($M = .05$); but, subjects who read the three weak arguments purportedly generated by three different people expressed less agreement with the exam proposal ($M = -1.24$) than subjects who read the same weak arguments presumably generated by one person ($M = .11$). The latter effect is especially intriguing because it provides one instance in which the more people who endorse a particular position, the *less* influence that results. Finally, the thought generation data provided further support for the cognitive effort hypothesis: subjects having the arguments presented by three different sources generated more favorable thoughts when the arguments were strong and more unfavorable thoughts when the arguments were weak than subjects having the arguments presented by a single source.

Limitations and implications

The results of the three studies described above provide strong support for the view that the number of sources who provide arguments in support of an advocacy appears to have an effect on persuasion over and above that which would be expected based on previous research on conformity, number of message arguments, and message repetition. This 'extra' effect appears to be due to the fact that the different arguments receive greater thought when they come from multiple sources rather than from a single source. All three studies showed that subjects receiving novel arguments from multiple sources generated more thoughts consistent with the quality of the arguments presented than subjects receiving the same novel arguments from a single source. People are apparently more willing to engage in effortful cognitive activity when the information they receive comes from multiple sources rather than from a single source.

Of course, future research will be directed at determining the limiting conditions of the multiple-source effect. For example, in the research reported here all of the sources presented arguments on the same topic. If the topics were switched, then subjects might be motivated to engage in further thought about the information presented by a single source because the subject would not have heard the source's view on the second topic. This would eliminate the multiple-source effect by motivating more processing of information presented by single sources. Another way to eliminate the multiple-source effect would be to reduce motivation to process the information from many sources. For example, Wilder (1977) has shown that conformity was reduced by subjects' perceptions that the sources of influence were not independent. This suggests that to the extent that the multiple speakers' arguments are not seen as independently generated, their persuasive impact may be reduced. Thus, if subjects were told that the arguments were generated by a committee, members of which would be presenting them, we might expect that multiple speakers presenting multiple arguments would elicit no more persuasion than that found with single sources.

Summary and conclusions

The research that we have presented in this chapter delineates the effects of two basic, yet largely ignored, features of the persuasion setting: the number of message recipients and the number of message sources. The data from these studies are consistent with the notion that under certain conditions, the same process (i.e. idiosyncratic thought about the appeal) mediates the effects of number both of recipients and sources. These studies suggest the following:

1. When subjects are the targets of a communication and are individually responsible for evaluating the message, they put more effort into processing

the arguments than subjects who share the responsibility for the evaluation with other people.

2. When subjects are the targets of a communication presented by multiple sources, they put more effort into processing the arguments than subjects who are targets of the same communication presented by a single source.
3. Depending on the quality of the arguments in the message, modifications in the amount of cognitive effort expended can lead to enhanced or diminished persuasion. If the arguments in the message are normally convincing, then increasing cognitive effort leads to the discovery of the merits of the arguments and enhanced persuasion; if the arguments are unconvincing, increasing the cognitive effort expended leads to the discovery of the message flaws and diminished persuasion.

These findings suggest that the number of sources and the number of recipients of persuasive messages, relatively ignored variables, can play an important role in persuasion, and that this role is mediated by the amount of cognitive effort the recipients devote to cognitively elaborating (thinking about) the content of the message. The cognitive responses produced by expending effort (favorable or unfavorable thoughts) then mediate the direction and amount of attitude change produced.

Notes

1. Of course there are some well-known exceptions to this general statement (e.g. conformity research) which we address later in the chapter.

2. Dissonance theory would expect that increased effort would be associated with more favorable attitudes for all messages, since for each message individual evaluators would have to justify their enhanced effort. Commodity Theory would similarly expect all three messages to show enhanced value with increasing effort. Deindividuation theory would expect all group evaluators to exert the least effort and to give the least favorable evaluations since their individual responses are anonymously hidden in the group evaluation. None of these formulations can account for more effort (by individual evaluators) being associated with *less* favorable evaluations as was the case for the weak message.

3. For example, using the quality of education argument, Speaker A stated: 'My brother went to NU and didn't really learn anything. If he had known all along that he would have to take comprehensive exams, he would have tried harder as he went along and would have learned something.' Speaker B's version of this argument was: 'We have all heard about how students graduated from high school without really knowing how to read and write. Senior comprehensive exams would make sure that students couldn't graduate from NU without the basic skills.'

4. There are also a number of other accounts that cannot explain the pattern of data. Differential recall of the arguments cannot account for the results because subjects hearing the three arguments presented by one person recalled the same number of arguments as subjects hearing the arguments presented by three persons. Differential inferences about the number of people who endorsed the proposal cannot account for the results because subjects in all experimental cells made the same inferences about the number of others who endorsed the proposal (see Harkins and Petty, 1981, for further

details on these measures). Message repetition is also not a viable explanation for the potent effect of three sources presenting one unique argument each because in this condition no argument was repeated. Furthermore, even in the three source-one argument condition where one argument was repeated three times, enhanced persuasion did not result. As noted earlier, we had hoped to avoid repetition effects in this study and were apparently successful in doing so by employing short and simple arguments that were easily understood the first time they were presented. It is likely that a repetition effect would have emerged if longer or more complicated arguments had been presented (Harrison, 1977; Sawyer, 1981).

References

- Allen, V. L. (1965). 'Situational factors in conformity,' in L. Berkowitz (ed.), *Advances in Experimental Social Psychology*, Vol. 2, Academic Press, New York.
- Allport, G. W. (1935). 'Attitudes,' in C. Murchison (ed.), *Handbook of Social Psychology*, Vol. 2, Clark University Press, Worcester, Mass.
- Asch, S. E. (1951). 'Effects of group pressure upon the modification and distortion of judgment,' in H. Guetzkow (ed.), *Groups, Leadership and Men*, Carnegie, Pittsburgh.
- Brock, T. C. (1968). 'Implications of commodity theory for value change,' in A. Greenwald, T. Brock, and T. Ostrom (eds.), *Psychological Foundations of Attitudes*, Academic Press, New York.
- Burnstein, E., and Vinokur, A. (1977). 'Persuasive argumentation and social comparison as determinants of attitude polarization,' *Journal of Experimental Social Psychology*, **13**, 315-332.
- Cacioppo, J. T. (1979). 'Effects of exogenous changes in heart rate on facilitation of thought and resistance to persuasion,' *Journal of Personality and Social Psychology*, **37**, 489-498.
- Cacioppo, J. T., Harkins, S. G., and Petty, R. E. (1981). 'The nature of attitudes and cognitive responses and their relationships to behavior,' in R. E. Petty, T. M. Ostrom, and T. C. Brock (eds.), *Cognitive Responses in Persuasion*, Erlbaum, Hillsdale, NJ.
- Cacioppo, J. T., and Petty, R. E. (1979). 'Effects of message repetition and position on cognitive responses, recall, and persuasion,' *Journal of Personality and Social Psychology*, **37**, 97-109.
- Cacioppo, J. T., and Petty, R. E. (1980). 'Persuasiveness of communications is affected by exposure frequency and message quality,' in J. Leigh and C. Martin (eds.), *Current Issues and Research in Advertising, 1980*, University of Michigan, Ann Arbor.
- Calder, B. J., Insko, C. A., and Yandell, B. (1974). 'The relation of cognitive and memorial processes to persuasion in a simulated jury trial,' *Journal of Applied Social Psychology*, **4**, 62-93.
- Campbell, A., Converse, P., Miller, W., and Stokes, D. (1964). *The American Voter: An Abridgement*, Wiley, New York.
- Cohen, A. R. (1959). 'Communication discrepancy and attitude change: A dissonance theory approach,' *Journal of Personality*, **27**, 386-396.
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*, Row, Peterson, Evanston, Ill.
- Harkins, S. G., Latané, B., and Williams, K. (1980). 'Social loafing: Allocating effort or taking it easy?,' *Journal of Experimental Social Psychology*, **16**, 457-465.
- Harkins, S. G., and Petty, R. E. (1981). 'The effects of source magnification of cognitive effort on attitudes: An information processing view,' *Journal of Personality and Social Psychology*, **40**, 401-413.
- Harrison, A. A. (1977). 'Mere exposure,' in L. Berkowitz (ed.), *Advances in Experimental Social Psychology*, Vol. 10, Academic Press, New York.

- Ingham, A. G., Levinger, G., Graves, J., and Peckham, V. (1974). 'The Ringelmann effect: Studies of group size and group performance,' *Journal of Experimental Social Psychology*, **10**, 371-384.
- Insko, C. A., Lind, E. A., and LaTour, S. (1976). 'Persuasion, recall, and thoughts,' *Representative Research in Social Psychology*, **7**, 66-78.
- Jones, E. E., and Gerard, H. B. (1967). *Foundations of Social Psychology*, Wiley, New York.
- Kiesler, C. A., and Kiesler, S. B. (1969). *Conformity*, Addison-Wesley, Reading, Mass.
- Knower, F. H. (1935). 'Experimental studies of change in attitude: I. A study of the effect of oral arguments on changes of attitudes,' *Journal of Social Psychology*, **6**, 315-347.
- Knower, F. H. (1936). 'Experimental studies of changes in attitudes: II. A study of effect of printed arguments on changes in attitudes,' *Journal of Abnormal and Social Psychology*, **30**, 522-532.
- Krech, D., Crutchfield, R., and Ballachey, E. (1962). *Individual in Society*, McGraw-Hill, New York.
- Latané, B. (1976). 'A theory of social impact,' Paper presented at the 21st International Congress of Psychology, Paris, July.
- Latané, B., and Dabbs, J. (1975). 'Sex, group size, and helping in three cities,' *Sociometry*, **38**, 180-194.
- Latané, B., and Darley, J. (1970). *The unresponsive bystander: Why doesn't he help?* Appleton-Century-Crofts, New York.
- Latané, B., Williams, K. D., and Harkins, S. G. (1979). 'Many hands make light the work: The causes and consequences of social loafing,' *Journal of Personality and Social Psychology*, **37**, 822-832.
- Levy, P., Lundgren, D., Ansel, M., Fell, D., Fink, B., and McGrath, J. (1972). 'Bystander effect in a demand without threat situation,' *Journal of Personality and Social Psychology*, **24**, 166-171.
- Newton, J. W., and Mann, L. (1980). 'Crowd size as a factor in the persuasion process: A study of religious crusade meetings,' *Journal of Personality and Social Psychology*, **39**, 874-883.
- Petty, R. E., and Cacioppo, J. T. (1979a). 'Effects of forewarning of persuasive intent and involvement on cognitive responses and persuasion,' *Personality and Social Psychology Bulletin*, **5**, 173-176.
- Petty, R. E., and Cacioppo, J. T. (1979b). 'Issue involvement can increase or decrease persuasion by enhancing message-relevant cognitive responses,' *Journal of Personality and Social Psychology*, **37**, 1915-1926.
- Petty, R. E., and Cacioppo, J. T. (1981). *Attitudes and Persuasion: Classic and Contemporary Approaches*, Wm. C. Brown, Dubuque, Iowa.
- Petty, R. E., Harkins, S. G., and Williams, K. D. (1980). 'The effects of group diffusion of cognitive effort on attitudes: An information processing view,' *Journal of Personality and Social Psychology*, **38**, 81-92.
- Petty, R. E., Harkins, S. G., Williams, K. D., and Latané, B. (1977a). 'The effects of group size on cognitive effort and evaluation,' *Personality and Social Psychology Bulletin*, **3**, 579-582.
- Petty, R. E., Williams, K. D., Harkins, S. G., and Latané, B. (1977b). 'Social inhibition of helping yourself: Bystander response to a cheeseburger,' *Personality and Social Psychology Bulletin*, **3**, 575-578.
- Sawyer, A. (1981). 'Repetition and cognitive responses,' in R. E. Petty, T. M. Ostrom, and T. C. Brock (eds.), *Cognitive Responses in Persuasion*, Erlbaum, Hillsdale, NJ.
- White, D. (1975). 'Contextual determinants of opinion judgments: Field experimental probes of judgmental relativity boundary conditions,' *Journal of Personality and Social Psychology*, **32**, 1047-1054.

- Wicklund, R. A., Cooper, J., and Linder, D. (1967). 'Effects of expected effort on attitude change prior to exposure,' *Journal of Experimental Social Psychology*, 2, 416-428.
- Wilder, D. (1977). 'Perception of groups, size of opposition and social influence,' *Journal of Experimental Social Psychology*, 13, 253-268.
- Zimbardo, P. G. (1970). 'The human choice: Individuation, reason, and order, versus deindividuation, impulse and chaos,' in W. Arnold and D. Levine (eds.), *Nebraska Symposium on Motivation, 1969*, Vol. 17, University of Nebraska Press, Lincoln.