Positive Mood and Persuasion: Different Roles for Affect Under High- and Low-Elaboration Conditions

Richard E. Petty, David W. Schumann, Steven A. Richman, and Alan J. Strathman

Two experiments examined the processes by which positive mood influences attitude change under high and low message elaboration conditions. To examine elaboration, Experiment 1 included individuals who differed in their need for cognition, and Experiment 2 manipulated the relevance of the message. In each study, Ss were exposed to a persuasive communication following a positive or neutral mood induction. In both studies, positive mood produced more positive attitudes toward the advocacy, but positive mood influenced the positivity of Ss' thoughts only under high-elaboration conditions. Path analyses showed that positive mood had a direct effect on attitudes in the low-elaboration conditions but influenced attitudes indirectly by modifying the positivity of thoughts in the high-elaboration conditions.

Does a positive mood facilitate persuasion? Many of the initial studies addressing this question suggested that manipulations inducing a positive mood either just before or during a persuasive communication increased the likelihood of attitude change (e.g., Biggers & Pryor, 1982; Driben & Brabender, 1979; Srull, 1983). These "main effect" findings were so consistent that in reviewing the work on positive affect and persuasion, McGuire (1985) concluded that

Persuasive impact is greater if the person is in a happy, benevolent mood when the message comes, noshing on peanuts and soda (Janis, Kaye, and Kirschner, 1965), watching a good program (Krugman, 1983), and with pleasant musical background (Gallizio and Hendrick, 1972), an appropriately scented other (Baron, 1983), a smile on one's face (Laird, 1974), nodding one's head (Wells and Petty, 1980), or relaxed in position (Petty, Wells, Hessacker, Brock, and Cacioppo, 1983). (p. 285)

Since 1985, however, the picture has become more complicated. In particular, recent studies have found that positive mood effects can be dependent on the quality of the arguments in a message (e.g., Batra & Stayman, 1990; Bless, Bohner, Schwarz, & Strack, 1990; Mackie & Worth, 1989; Worth & Mackie, 1987). Not surprisingly, different theories have been proposed to account for the earlier main effect versus more recent interaction findings. After a brief review of the various positions, we argue that it is premature to abandon the processes advocated by the earlier main effect theorists in favor of an exclusive reliance on the processes inherent in the more recent theories predicting interactions of mood and argument quality.

Main Effect Theories

Several explanations have been proposed to account for the finding that positive mood is associated with increased persuasion. Many of the initial investigators were guided by classical conditioning notions and proposed that positive affect yielded favorable attitudes and negative affect produced unfavorable attitudes by a relatively simple association process (e.g., Griffitt, 1970; Zanna, Kiesler, & Pilkonis, 1970). More recently, it has been suggested that a simple inference process might be responsible for the effect of mood on attitudes. For example, if people misattribute the cause of their mood to the persuasive message (e.g., I must be feeling good because I like or agree with the message), positive affect could be associated with increased influence and negative affect could be associated with decreased influence (see Cacioppo & Petty, 1982a; Chaiken & Stangor, 1987; Petty & Cacioppo, 1983; Schumann & Thorson, 1990; Schwarz & Clore, 1983; Zillmann, 1978). The basic idea of these approaches is that affect can produce a relatively direct impact on attitudes through a simple association or inference process. None of these models requires that the individual think about the information in the persuasive message per se.

A second group of theorists has noted that mood can exert a
main effect on attitudes by biasing the thoughts that come to mind as a person thinks about the persuasive communication. Specifically, current research suggests that positive mood may selectively facilitate retrieval of positive information from memory and inhibit retrieval of negative material, whereas negative mood may selectively facilitate retrieval of negative information and inhibit retrieval of positive material (Blaney, 1986; Bower, 1981; Clark & Isen, 1982). One consequence of the greater accessibility or priming of mood-congruent material may be that positive mood would bias the perception and interpretation of the message arguments in a favorable manner, but negative mood would produce an unfavorable cognitive bias (see Forgas & Bower, 1988; Mackie, Asuncion, & Rosselli, 1992). That is, a person's mood during a persuasive message could be related to the favorability of the thoughts generated while thinking about that message. This biased-thinking effect should be most likely to occur when people are motivated and able to think about the message presented to them (Liberman & Chaiken, in press; Petty & Cacioppo, 1979a) and the information to be evaluated is somewhat ambiguous (Chaiken, Liberman, & Eagly, 1989; Tesser & Cowan, 1975).

Evidence for the view that mood can be related to the valence of message-relevant thoughts was obtained in some recent research. For example, in one study Breckler and Wiggins (1991) presented subjects with a pro- and an antiabortion message. Following each message, subjects rated their current mood and listed their thoughts. Mood was a significant predictor of thoughts for each message. Specifically, in response to both messages, the more negative the mood reported, the more negative the content of the thoughts. For one of the messages, ratings of positive mood also correlated with thoughts—the more positive the mood, the more positive the thoughts. Of course, given that mood was not directly manipulated in this study, it is not clear if mood produced thoughts, thoughts induced the mood, or some third variable was responsible for the correlation.

In a study manipulating mood, Mathur and Chattopadhyay (1991) embedded one of two commercials in either a relatively happy or a sad television program. Following exposure to the program, subjects listed their thoughts about the ads. The major result was that subjects exposed to the happy program listed a significantly greater proportion of positive thoughts about the commercials ($M = 0.45$) than subjects exposed to the sad program ($M = 0.26$). Unfortunately, no attitude measures were assessed in this study. Nevertheless, the Breckler-Wiggins and Mathur-Chattopadhyay studies are consistent with the idea that moods can have an impact on the valence of subjects' thoughts during message exposure (see also Goldberg & Gorn, 1987).

Multiple Processes Responsible for Main Effects of Mood on Persuasion

To date, investigators exploring the main effects of mood on responses to a persuasive message and other evaluative judgments have tended to focus on just one of the processes outlined earlier. Yet, it seems unlikely that either the relatively thoughtful or the nonthoughtful processes proposed would account for all of the observed main effects of mood on attitudes. Contemporary persuasion studies guided by the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1986) and the Heuristic-Systematic Model (HSM; Chaiken et al., 1989) have shown clearly that the processes of attitude change can be different in different situations. Specifically, when the motivation and ability of message recipients to think carefully and systematically about the issue-relevant arguments contained in a persuasive communication are high, postmessage attitudes are dependent on the positivity of the issue-relevant thoughts generated in response to the message arguments (e.g., Axsom, Yates, & Chaiken, 1987; Cacioppo, Petty, & Morris, 1983; Petty & Cacioppo, 1979b). When motivation or ability for systematic processing of the message is low, however, postmessage attitudes are more dependent on reactions to peripheral cues in the persuasion environment such as the likability of the message source (Chaiken, 1980) or whether the message comes from an in-group or from an out-group member (Mackie, Worth, & Asuncion, 1990).

One intriguing but complicating issue in recent persuasion work is the discovery that any one variable can serve in different roles depending on the overall likelihood of message elaboration (Petty & Cacioppo, 1986). For example, consider the impact of increasing the number of arguments contained in a persuasive communication. Research indicates that when people are motivated and able to think about the arguments, increasing the number of arguments is effective primarily when the arguments are strong and compelling. Increasing the number of weak arguments produces reduced persuasion. On the other hand, when people are relatively unmotivated or unable to think about the merits of the arguments, the more arguments presented, the more persuasion that results regardless of argument quality (Alba & Marmorstein, 1987; Petty & Cacioppo, 1984). These results suggest that increasing the number of strong arguments in a message can lead to more persuasion by two quite different processes. When the likelihood of message elaboration is low, increasing the number of arguments enhances persuasion because the mere number of arguments serves as a peripheral cue and may invoke the heuristic—the more arguments, the more valid the message must be. On the other hand, when the likelihood of elaboration is high, a manipulation of argument number produces persuasion by a more thoughtful process in which the arguments are carefully scrutinized and evaluated (Chaiken, 1987; Petty & Cacioppo, 1984).

The primary goal of the present research is to examine two roles that positive affect might be expected to play in different persuasion contexts. In particular, we focus on how affect might work differently at two points on the elaboration likelihood continuum. Specifically, when people are relatively unmotivated or unable to think about the arguments in a persuasive message, a person's mood, to the extent that it has any effect at all, should be most likely to serve as a simple cue. As a cue, affect should induce change that is consistent with its direction. That is, the presence of positive affect should lead to more favorable attitudes than conditions of neutral affect. This result could occur either because of a relatively simple affect transfer process or because of a simple misattribution or heuristic process in which people reason that they are pleased by the persuasive message. In contrast, when people are relatively motivated and able to think about the arguments in the communication, mood is expected to influence and bias the ongoing informa-
tion-processing activity. That is, when in a positive mood, people should be biased toward generating and retrieving favorable implications of the arguments and inhibited and disrupted from generating and retrieving unfavorable implications. As a result of these processes, the proportion of thoughts generated in response to a message should become more positive as a person's mood becomes more pleasant.

Before describing our test of these notions, it is important to consider the positions of a number of recent theorists who have argued for another possible role for positive affect—that positive mood can inhibit the overall extent of message processing in a relatively unbiased manner.

Effects of Positive Mood on the Extent of Message Processing

Beginning in the 1970s, a number of persuasion studies have revealed that a variable can have opposite effects on attitude change depending on the quality of the arguments that the message contains. For example, in the initial persuasion study that used a manipulation of argument quality to assess the extent of message processing, external distraction was shown to reduce persuasion when the arguments in the message were cogent and compelling but was shown to increase persuasion when the arguments were specious ( Petty, Wells, & Brock, 1976). The interaction of distraction and argument quality was consistent with the cognitive response model of persuasion, which focused on how variables influenced the amount and nature of message elaboration (see Eagly & Chaiken, 1993; Petty, Ostrom, & Brock, 1981; for reviews).

Interestingly, when the first investigation combined a manipulation of positive mood with one of argument quality, an interaction was observed such that positive mood, compared with neutral mood, tended to increase persuasion when the arguments were weak but tended to decrease it when the arguments were strong ( Worth & Mackie, 1987). This interaction pattern has subsequently been replicated (e.g., Bless et al., 1990; but see Smith & Shaffer, 1991), and theorists have presented at least three competing explanations for why positive mood might produce less message processing than either neutral or negative mood. Importantly, each theory also implies limitations to the positive mood disruption effect.

In the mood as information theory, the primary notion is that a person's mood signals the state of the person's world, and depending on this state, the person decides whether to allocate cognitive resources to the task at hand (see Schwarz, 1990). In particular, a negative mood signals that the environment is potentially problematic and that extra processing may be needed. On the other hand, positive mood signals that the environment is okay, so processing is not critical. Research explicitly examining the mood as information theory has demonstrated that individuals in a negative mood are more responsive to the quality of the arguments in a message than individuals in a positive mood ( Bless et al., 1990). What about neutral moods? Because the environment is typically okay when one is in a neutral mood, this state, like a positive mood, should not necessarily enhance information-processing activity over normal levels. That is, the mood as information theory focuses mostly on the enhancement in processing induced by negative moods (over neutral and positive ones) rather than the disruption induced by positive moods. In the current research, positive moods were compared with neutral rather than negative moods to minimize mood as information effects on the extent of processing.

Two other theories focus more explicitly on the disrupting effects of positive compared with neutral mood. In the mood maintenance theory ( Isen, Means, Patrick, & Nowicki, 1982; Isen & Simmonds, 1978; Sinclair & Mark, 1992), the primary notion is that people may sometimes be less motivated to process a persuasive communication when in a positive mood than when in a neutral mood because people who are feeling good want to maintain their pleasant feelings. They therefore are less willing to think about messages that could potentially destroy their current state. One implication of this theory is that individuals in a positive mood should be especially likely to avoid thinking about counterattitudinal or unpleasant topics. To attenuate mood maintenance considerations, we used neutral rather than negative or unpleasant topics in the current research.

Finally, the cognitive capacity theory holds that one consequence of the availability of mood-congruent material in memory is that some impairment in cognitive processing is likely to result ( Isen et al., 1982; Mackie et al., 1992). That is, the more mood-congruent material that comes into working memory, the less capacity there is available to process a persuasive communication. Thus, people in positive or negative moods may be less able to elaborate the arguments in a communication than people in more neutral states. Importantly, the capacity theory expects a disruptive effect of positive mood mostly when people have insufficient time to think about the message. Researchers guided by this notion have nicely shown that even if the message is counterattitudinal or unpleasant, no disruption effect for positive relative to neutral mood occurs if sufficient time is allowed to process the message. In one such study, simply allowing 70 rather than 60 s for message exposure was sufficient to eliminate the disruptive effect of positive mood ( Mackie & Worth, 1989). To attenuate any cognitive capacity effects, we did not place subjects under time pressure and allowed them sufficient opportunity to think about the communications presented.

In short, by relying on current conceptualizations of why and when mood is expected to influence the extent of information-processing activity, we attempted to attenuate any disrupting effects of positive mood in the current research. In addition to taking steps to decrease the likelihood of positive mood disruption effects, we took additional steps to enhance the likelihood that positive mood would serve in the alternative roles outlined previously. These steps are described shortly.

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1 Even though the focus in Schwarz's (1990) theory is on the enhanced processing in a negative mood relative to in a positive or neutral mood, it is possible to propose that positive mood signals that the world is so good that processing should be reduced below normal levels. It also appears implicit in this formulation that the enhanced processing effects of negative mood should be most likely when the message topic is plausibly related to some self-relevant problem (e.g., a tuition increase at one's own university; Bless et al., 1990). In the present research, none of the topics pointed to self-relevant problems.
Hypothesized Effects of Mood at Two Levels of Elaboration

Our primary goal in the present research was to explore the processes postulated as responsible for the previously observed main effects of positive mood on attitudes while controlling for the disrupting effects of mood on argument processing. Our major hypothesis was that positive mood would have an impact on attitudes by different processes depending on the elaboration likelihood conditions. Under low-elaboration conditions, positive mood was expected to have an impact on attitudes that was unmediated by thoughts (i.e., a direct effect). Under high-elaboration conditions, however, positive mood was expected to influence attitudes indirectly through its effect on valenced thoughts.

To test these ideas, we conducted two experiments. In each study we used well-established procedures for varying the likelihood of message processing. Individuals who were relatively motivated or unmotivated to engage in systematic processing (or follow the central rather than the peripheral route to persuasion) were placed in either a positive or a neutral mood and then exposed to a persuasive communication. Ability to think about the message was high in all conditions. Following exposure to the message, subjects reported their attitudes toward the message topic and listed their thoughts. It was expected that both high- and low-elaboration subjects would show more favorable attitudes toward the message position when in a positive than when in a neutral mood. Thus, the attitude data alone would not distinguish whether positive mood influences attitudes by different processes under relatively high- and low-elaboration conditions. On the other hand, a thought-listing measure was expected to provide evidence for different processes. In the high-elaboration conditions, subjects in a positive mood were expected to show greater positivity in their thoughts than subjects in a neutral mood. In the low elaboration conditions, however, positive mood was not expected to have an impact on thoughts even though it did have an impact on attitudes. Furthermore, thoughts were postulated as a mediator of the effect of mood on attitudes under high- but not under low-elaboration conditions.

Prior Research Examining Mood at More Than One Level of Elaboration

At least four prior studies provide data relevant to examining the effects of positive mood under two elaboration conditions. In the first such study, Bless et al. (1990) examined the effects of positive versus negative mood on individuals who were either instructed to evaluate the quality of the arguments provided (high-elaboration conditions) or instructed to focus on the language used in the message (moderate-elaboration conditions). The major persuasion result from this study was that the attitudes of subjects in a bad mood were more influenced by argument quality than were the attitudes of subjects in a good mood. However, no evidence was obtained for the view that positive mood biased the thoughts generated by high-elaboration compared with moderate-elaboration subjects. There are a number of possible explanations for this. First, the high-elaboration subjects in this study were told explicitly to focus on the quality of the arguments in the message. This instruction may have induced an objective processing set that would make biased processing less likely. Second, the message used by Bless et al. was highly counterattitudinal (advocating an increase in tuition at the subjects' university). Because highly accessible negative attitudes can bias thinking in a negative manner (e.g., Fazio & Williams, 1986), this process could have attenuated and counteracted any favorable thinking bias induced by the positive mood.

In a second study, Bless et al. (1990) again examined the effect of positive mood on persuasion under two elaboration conditions, but this time the moderate-elaboration condition (subjects were again told that the study concerned language comprehension) was compared with a low-elaboration condition (subjects were explicitly distracted from processing the message). The same strong and weak counterattitudinal messages from the previous study were used. In the moderate-elaboration conditions, positive mood inhibited message processing. In the low-elaboration conditions, however, subjects did not respond differentially to the quality of arguments in the message and showed only slightly (though not significantly) more persuasion when in a positive than when in a negative mood, as the simple cue hypothesis expects. In this low-elaboration instance, however, spontaneous retrieval of a highly negative attitude toward the topic could serve as a simple cue as to the invalidity of the message (Petty, Cacioppo, & Haugtvedt, 1992; see Sanbonmatsu & Fazio, 1990, for an example). An accessible negative attitude toward the topic could have attenuated and counteracted the value of positive mood as a cue.

Our hypotheses might fare better if researchers used a message that was not so strongly counterattitudinal and for which no highly accessible negative attitude was likely to be retrieved. Such a test was provided in a study by Batra and Stayman (1990). In this research, individuals who were high or low in need for cognition (NC; Cacioppo & Petty, 1982b) read either a happy story (positive mood) or no story (neutral mood) before being exposed to a strong or weak advertisement for a new bank. In accord with much of the earlier mood and persuasion

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2 Two versions of the message were used in each experiment, with one message designed to be more persuasive than the other. This manipulation was somewhat different from that used in much of our previous research varying argument quality. That is, the arguments were not pretested and selected according to the thought-listing criteria outlined in Petty and Cacioppo (1986). The reason for this was that arguments that were too clearly strong or weak would make biased processing under high-elaboration conditions difficult (see Chaiken et al., 1989; Tesser & Cowan, 1975). Thus, the arguments we used were different in their rated persuasiveness but somewhat ambiguous in interpretation (e.g., it was possible to see some merit in the weak arguments).

3 Consistent with the present hypotheses, Batra and Stayman (1990) predicted that mood would have a direct effect on the attitudes of low-NC (i.e., low-elaboration likelihood) individuals. Surprisingly, they also predicted that mood would have a greater biasing impact on thoughts for low- than for high-NC individuals because they believed that high-NC individuals "should be more motivated to process information objectively and veridically" (p. 206) than low-NC individuals. Because the Need for Cognition Scale was developed to differentiate people who simply enjoyed thinking, without respect to whether that
literature, a main effect for mood indicated that attitudes were more favorable when subjects were in a positive, rather than in a neutral, mood. In addition, a Mood × NC interaction indicated that the increase was significant for low-NC subjects, but there was no mood effect for high-NC individuals. This was unfortunate in that it precludes examination of any differential mediation of the positive mood effect for people high and low in NC because there was no effect of positive mood to mediate for the high-NC individuals. Because high-NC subjects had significantly more favorable attitudes than low-NC subjects in the neutral mood condition, it may have been more difficult to produce an improvement in their attitudes. Next, a Mood × Argument Quality interaction emerged. The interaction showed that positive mood led to significantly more favorable attitudes on the part of subjects exposed to weak arguments, but the increase in attitudes with positive mood was not significant for subjects exposed to strong arguments.

Finally, Batra and Stayman (1990) investigated whether the increase in persuasion for low-NC individuals in a positive mood was due to a direct effect of mood or was mediated by the nature of the thoughts these subjects generated. Because the effect of mood on attitudes for low-NC subjects remained significant when thoughts were covaried, they concluded that thoughts did not mediate mood effects on attitudes for these subjects. Thus, Batra and Stayman provided explicit evidence for the notion that positive mood can have an impact on attitudes that is unmediated by thoughts under low-elaboration conditions (i.e., for low-NC subjects), but no evidence was obtained for an effect of positive mood that was mediated by thoughts for high-elaboration individuals. Of course, as noted previously, because mood had no effect on attitudes for high-NC subjects, there was no attitude effect to mediate.

In the most recent study examining mood at two levels of elaboration likelihood, Smith and Shaffer (1991) used an unfamiliar topic about which an accessible attitude was unlikely to have been available. Subjects were placed in a positive or neutral mood by exposing them to a humorous or a neutral videotape, and likelihood of elaboration was varied by manipulating the personal relevance of the communication (Petty & Cacioppo, 1979b). Following the mood-inducing videotape, subjects heard a message containing strong or weak arguments. Surprisingly, the attitude data revealed no effects for any of the manipulations failing to support the mood disruption hypothesis, the cue hypothesis, or the biased-processing view. Nevertheless, an analysis of subjects' thoughts provided some evidence consistent with a biased-processing explanation. Specifically, a Mood × Relevance interaction on the net positivity of thoughts (number of favorable elaborations minus number of unfavorable elaborations) revealed that under the high-relevance conditions, thoughts shifted from mostly unfavorable when in a neutral mood ($M = -0.40$) to mostly favorable when in a positive mood ($M = 0.46$). Under low-relevance conditions, however, subjects' thoughts did not become more favorable when in a positive ($M = -0.67$) than in a neutral ($M = -0.06$) mood. In short, as expected by the biased-processing hypothesis, positive mood enhanced the net positivity of thoughts when the likelihood of systematic processing was high but not when it was low. It is unclear why the thought differences failed to produce differences in attitudes, however.

In sum, past research has provided some evidence for the view that (a) positive mood can have a direct effect on subjects' attitudes that is not mediated by thoughts when the likelihood of elaboration is low (Batra & Stayman, 1990) and (b) positive mood can increase the net positivity of the thoughts generated (Mathur & Chattopadhyay, 1991), especially when the elaboration likelihood is high (Smith & Shaffer, 1991). No study has been successful in demonstrating both of these processes, however. A number of possible reasons for these failures were noted previously.

Overview of the Present Research

In the present research, we included a number of features that would make it more likely that we would observe the hypothesized cue and biased-processing effects postulated for positive mood. First, we took every precaution to minimize the likelihood of observing thought disruption effects for positive mood. The precautions we took were based explicitly on the three prevailing theories of positive mood disruption effects. Specifically, in consideration of the mood maintenance view of disruption, we used relatively neutral rather than unpleasant topics. In light of the cognitive capacity view, we allowed subjects sufficient time to process the messages. In consideration of the mood as information model, we examined positive versus neutral rather than positive versus negative mood.

In each of the two studies that we conducted, subjects who were relatively likely or unlikely to think about the message arguments were exposed to a persuasive communication while they were in a positive or in a neutral mood. We expected positive mood to be associated with more favorable attitudes under both high- and low-elaboration conditions but for the enhanced persuasion to be mediated by enhanced positive thoughts under high-elaboration but not low-elaboration conditions. To increase the likelihood of observing these effects, we avoided topics for which subjects had highly accessible negative attitudes or prior information. We also avoided instructions that would induce an objective processing set, and we used message arguments that were more ambiguously strong and weak than those used in our past research (see footnote 2).

Experiment 1

In our first study, the likelihood of message processing was varied by selecting individuals who differed in their need for cognition (NC; Cacioppo & Petty, 1982b). Individuals who are high in NC enjoy thinking, and their attitudes in response to a persuasive communication are tied to the quality of the arguments in the message and to the positivity of the thoughts they

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4 This Mood × Involvement interaction, $F(1, 52) = 4.76, p < .05$, on the net positivity of thoughts was reported in a prepublication manuscript but was deleted from the final published report of this study (Smith & Shaffer, 1991, Experiment 1). We thank S. Smith (personal communication, February 2, 1992) for providing this analysis.
generate in response to the message (Cacioppo et al., 1983). On the other hand, individuals who are low in NC tend to avoid cognitive work. Their attitudes in response to a persuasive message are less tied to the message-relevant thoughts generated and are more influenced by the presence of peripheral cues (e.g., Axsom et al., 1987; Haugtvedt, Petty, & Cacioppo, 1992). In Experiment 1, individuals who were high and low in NC were placed in a positive or neutral mood and then exposed to a persuasive message containing moderately strong or weak arguments.

Method

Subjects and Design

Participating in the study for credit in their introductory psychology classes were 137 undergraduate students at a large midwestern university. The experiment was a 2 (mood: neutral or positive) × 2 (argument quality: moderately weak or strong) × 2 (NC: low or high) between-subjects factorial design. Subjects were randomly assigned to the mood and argument quality conditions.3

Procedure

On arrival at the lab, participants were seated in one of six cubicles that were constructed to prevent visual contact with other participants. Each cubicle contained a cassette recorder, headphones, and a questionnaire booklet. Subjects were told that the psychology department was involved in pretesting a variety of materials to use in future experiments and that they would be involved in several unrelated tasks during the experimental hour. In an attempt to reduce individual differences in initial mood and to maximize the effectiveness of our relatively brief mood manipulation, we had all subjects engage in a series of "neutralizing" tasks before the mood induction. Specifically, subjects completed a three-page booklet containing math problems, a word-search task, and an alphabetizing task. The tasks were developed in pretesting to be mildly involving but without affective overtones. After completion of the neutralizing tasks, the subjects were instructed to start the cassette recorders on their desks. They were further instructed to raise their hands when they heard a distinctive tone that signaled the end of the tape. The tape contained the mood manipulation, the persuasive message, and all instructions. When subjects raised their hands at the end of the tape, they were given a questionnaire containing the attitude and other measures. On completion of the questionnaire, the subjects were debriefed, thanked, and dismissed.

Independent Variables

Mood. Subjects who were randomly assigned to the positive mood condition were given a sheet of paper along with their cassette tape. The top of the paper was labeled Positive Life Event. The male voice on the tape explained that the department of psychology was developing a life-event inventory and that positive life events were needed. Subjects were asked to recall in detail a recent event in their lives that made them feel very positive. They were then given 5.5 min to write as detailed and vivid a description of the positive event as possible. This manipulation was modeled after one used by Bless et al. (1990).

For subjects in the neutral mood condition, the tape consisted of 5.5 min of classical music that had been found in pretesting to leave subjects in a neutral mood. Pretesting also revealed that subjects exposed to the positive mood manipulation felt significantly more happy (M = 11.86) than subjects exposed to the neutral mood manipulation (M = 7.14), F(1, 12) = 19.56, p < .001. Responses were made on a 15-point scale anchored by sad—depressed and happy—relaxed.

Argument quality. Following the mood manipulation, subjects were told by a male voice that in the next part of the experiment they would listen to a radio editorial. The editorial was introduced by a female voice who forewarned subjects that she would argue that the typical state foster care program should be changed to emulate Rhode Island's program—a topic for which subjects had no prior information.

Both the strong and the weak argument editorials contained three arguments. The two versions of the arguments always advocated the same conclusion, but they were justified differently. For example, one of the argument conclusions was that other states should adopt the policy in Rhode Island where "children are required to stay with their foster parents until they are 18 years old rather than the customary 16 years." In the strong arguments message, this conclusion was justified by saying that "the Rhode Island program believes that it is important for children to have the support of their family when dealing with life's challenges." The weak justification was that "the Rhode Island program believes it is important for parents to have power and authority over the foster child for as long as possible." Pretesting revealed that the strong arguments were seen as more persuasive (M = 6.43) than the weak ones (M = 4.87) when rated on an 11-point scale ranging from very unpersuasive to very persuasive, F(1, 13) = 7.06, p < .02. Pilot testing also revealed that although subjects' initial responses to the weak arguments were relatively unfavorable, it was possible for them to interpret the weak arguments in a positive light (e.g., parental authority is good for discipline).

Need for cognition. After responding to all of the dependent measures, subjects completed the 18-item version of the Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984). The manipulations had no effect on subjects' NC scores. A median split was performed to create the high- and low-NC groups. In this sample, the range of scores was 27 to 82 (possible range = 18 to 90). The median score was 60.

Dependent Measures

Attitude index. Subjects' attitudes toward the Rhode Island foster care program were assessed with five questions. First, they rated the Rhode Island foster care program on three semantic differential scales anchored by good—bad, negative—positive, and wise—foolish. Next, they indicated on an agree—disagree scale the extent to which they agreed that the typical foster care program should be changed to more closely resemble Rhode Island's program. Finally, they indicated the extent to which they believed that Rhode Island's foster care program was a good one on a scale anchored by not at all persuaded and definitely persuaded. All scales contained 9 points, were highly intercorrelated (range = 0.59 to 0.82), and formed one factor when the primary dependent measures were analyzed in a factor analysis. Thus, the scales were summed to form one overall attitude index (possible range = 5 to 45).

Thought index. Following the attitude measures, subjects were instructed to list the thoughts that went through their minds as they listened to the editorial about foster care. They were told to write one thought per box and not to worry about grammar or spelling. Twenty-two boxes were provided for their individual thoughts. After listing

3 In addition, we attempted to lead half of our subjects to believe that the message would contain pleasant material and half to believe that the material would be unpleasant (the actual editorial content was not varied except for argument quality). The manipulation of anticipated pleasantness was included for exploratory purposes, proved weak, and did not modify the results when included in the analyses. Thus, the data were collapsed across this manipulation.
their thoughts for 3 min, they were instructed to go back and rate their thoughts as being either positive, negative, or neutral (see Cacioppo & Petty, 1981, for additional details on the thought-listing and scoring procedure). Because positive mood was expected to have its impact primarily on the positivity of subjects’ thoughts, the proportion of positive thoughts listed (ratio of positive thoughts to total) was used as the primary measure. Before analysis, two judges, unaware of conditions, examined all thoughts to delete those that were clearly irrelevant to the topic of the message. The judges agreed on 97% of the thoughts coded, and disagreements were resolved by discussion.

**Manipulation checks.** Several mood questions were asked. First, two items were used to assess subjects’ anticipated mood during the message. Subjects were asked about the extent to which they expected the message to contain information that would be depressing–uplifting and unpleasant–pleasant (see footnote 5). Four additional questions asked about their actual mood at different points in the experiment. Specifically, one question (sad–happy) asked them to recall their actual mood just before the message presentation, two questions (unpleasant–pleasant and depressed–uplifted) asked about their feelings during the message presentation, and one item (sad–happy) asked about their mood right now (i.e., after the message presentation). A factor analysis of all six mood measures with a Harris-Kaiser rotation for correlated factors revealed two factors. One factor contained the two questions on anticipated mood. These questions were not affected by the mood manipulation and are not discussed further. The other factor contained three of the four remaining questions on mood. These were the questions asking about subjects’ mood right now, before the message, and felt pleasantness during the message presentation. These three measures were combined and used as the manipulation check for mood. The possible range of scores on this index was from 3 (sad–unpleasant) to 45 (happy–pleasant).

To check on the argument quality manipulation, subjects were asked to rate the arguments in the editorial on a 15-point scale ranging from unconvincing to convincing.

**Message recall.** Following response to the manipulation check questions, subjects were asked to recall as many of the arguments provided in the message as they could. As with the thought-listing measure, they were instructed to ignore grammar and spelling and to simply write down the main point of each argument, one point per space. Because this measure yielded no significant effects, it is not discussed further.

**Results and Discussion**

**Manipulation Checks**

The manipulation checks and other measures were subjected to a 2 (mood: neutral or positive) × 2 (argument quality: weak or strong) × 2 (NC: low or high) between-subjects analysis of variance (ANOVA). Subjects assigned to the positive mood conditions reported feeling more positively on the mood index ($M = 26.68$) than did the neutral mood subjects ($M = 22.98$), $F(1, 126) = 12.28, p < .001$. Despite the success of the argument quality manipulation in pretesting, subjects exposed to the strong arguments in the experiment did not rate them as more convincing than did subjects exposed to the weak arguments. However, subjects in the positive mood conditions rated the arguments as more convincing ($M = 5.51$) than did subjects in the neutral mood conditions ($M = 4.72$), $F(1, 125) = 4.96, p < .05$.

**Attitudes**

Even though subjects exposed to the strong arguments failed to rate them as more convincing than those exposed to weak arguments, the argument quality manipulation had a significant effect on attitudes, $F(1, 129) = 7.78, p < .01$, indicating some success. Subjects exposed to the strong arguments held more positive attitudes toward Rhode Island’s foster care program ($M = 35.61$) than did subjects exposed to weak arguments ($M = 31.94$). Of greater interest was a significant main effect for mood, $F(1, 129) = 5.73, p < .02$, indicating that subjects in the positive mood condition showed more agreement with the message ($M = 35.42$) than subjects in the neutral mood condition ($M = 31.92$). The absence of a Mood × NC interaction ($F < 1$) indicated that positive mood was equally effective in inducing more positive attitudes for both high- and low-NC individuals (see left panel of Figure 1). No other effects were significant.

**Thought Index**

An ANOVA on the proportion of positive thoughts generated yielded no significant effects. Nevertheless, separate analyses of the data for high- and low-NC individuals provided some support for the hypothesized interaction pattern. Specifically, these analyses revealed that although positive mood had no impact on the proportion of positive thoughts generated by low-NC individuals ($F < 1$), positive mood tended to increase the proportion of positive thoughts generated by high-NC subjects, $F(1, 65) = 2.81, p < .05$, one-tailed (see right panel of Figure 1).

**Path Analyses**

In the experimental analyses reported previously, mood influenced the attitudes of both high- and low-NC subjects, but mood tended to influence the thoughts of high- but not low-NC individuals. To further examine the impact of mood on thoughts and attitudes for people who differed in NC, separate path analyses were conducted for the high- and low-NC groups. The analyses were conducted with LISREL VI (Jöreskog & Sörbom, 1984) to simultaneously estimate the three paths depicted in Figure 2. In the first set of analyses, the variables entered into the model were the dichotomous mood manipulation, the attitude index, and the proportion of positive thoughts generated. The first path coefficients in the left panel of Figure 2 present the results for low-NC individuals. For these presumably low-elaboration subjects, there was a significant direct effect of mood on attitudes that was not mediated by thoughts. This provides a conceptual replication of the Batra and Stayman (1990) study. As shown in the right panel, for high-NC

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6 To check on the overall accuracy of the subjects’ coding of the valence of their thoughts, a judge, unaware of condition, independently coded the valence of thoughts for a randomly selected sample of 30 subjects. The judge agreed with the subjects’ ratings in 98% of the cases, which is as good or better than that observed in prior persuasion research that did not manipulate mood (see Cacioppo & Petty, 1981, for a review). Analysis of the proportion of negative thoughts produced a conceptually similar though statistically weaker pattern of results in both studies (see footnotes 8 and 10).

7 In addition, an unexpected NC × Argument Quality interaction appeared on this measure, $F(1, 126) = 6.09, p < .05$, and revealed that high- but not low-NC subjects felt happier when exposed to weak rather than to strong arguments.
subjects there was no direct effect of mood on attitudes. Although there was a tendency for manipulated mood to have an effect on positive thoughts, this effect was not significant.

In a second set of path analyses, we substituted the mood manipulation check for the manipulated variable. This internal analysis would presumably be more sensitive in that it treats mood as a continuous variable and considers the idiosyncratic moods of subjects regardless of their experimental condition. The results of these analyses are presented as the second path coefficients in Figure 2. In these analyses, mood had a significant effect on the proportion of positive thoughts generated for high-NC individuals, and the proportion of positive thoughts in turn affected attitudes. That is, for the high-elaboration subjects, the more happy they were, the greater the proportion of positive thoughts they generated. The greater the proportion of positive thoughts they generated, the more they agreed with the message. The situation was different for low-NC individuals. Here, although thoughts still had an impact on attitudes, thoughts were uninfluenced by mood. Rather, mood again tended to have a direct impact on attitudes, though this time the effect was not significant.

The first set of path analyses provided support for a direct effect of mood on attitudes for low-NC individuals, and the second set of analyses provided support for the indirect effect of mood on attitudes through thoughts for high-NC subjects. In a third set of path analyses we looked for both direct and indirect effects to emerge. Recall that the mood index used in the path analysis just described contained three questions. One asked about the mood subjects experienced right after exposure to the message, one asked about mood before exposure to the message, and one asked about mood during the critical period of message processing. To obtain a more sensitive analysis of the effects of mood on thoughts and attitudes, we recomputed the path coefficients using only the mood measure assessing felt pleasantness during the message presentation. The results of these analyses, presented as the third path coefficients in Figure 2, provided stronger support for the hypotheses. Again, for high-NC subjects, mood had an effect on attitudes only.

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Figure 1. Left panel: Effects of mood on attitudes for high- and low-need-for-cognition (NC) individuals. Right panel: Effects of mood on the proportion of positive thoughts generated for high- and low-NC individuals.

Figure 2. Direct and indirect effects of positive mood on attitudes for low- (left panel) and high- (right panel) need-for-cognition individuals. (The first path coefficient refers to analyses with the manipulated mood variable. The second path coefficient refers to analyses with the multi-item mood manipulation check. The third path coefficient refers to analyses with the mood check on pleasantness during the message presentation [see text]. **) p < .05.**
through its effect on thoughts. In contrast, for low-NC subjects, mood only had a direct effect on attitudes.\footnote{Analyses using the percentage of negative thoughts subjects listed produced a similar pattern of results. For example, when using the manipulation check for mood in the path analyses, low-NC subjects showed a significant direct path (20, $p < .05$) between mood and attitudes but no effect of mood on thoughts (−.07, ns). For high-NC subjects, there was no direct effect of mood on attitudes (0.3, ns), but mood was inversely related to negative thoughts (−.23, $p < .05$). In both cases, negative thoughts were related to attitudes, but the relationship was somewhat stronger for high- (−.55, $p < .01$) than for low- (−.30, $p < .05$) NC individuals.}

Experiment 2

Experiment 1 provided both experimental and correlational results consistent with the hypotheses. Attitudes of both high- and low-NC individuals were influenced by the mood manipulation. However, the proportion of positive thoughts tended to be influenced for individuals high but not for those low in NC. Furthermore, the path analyses using the manipulation of mood provided a conceptual replication of Batra and Stayman's (1990) finding that mood can have a direct effect on attitudes that is unmediated by thoughts for subjects low in NC. The analyses using subjects’ self-reports of mood showed that experienced mood can also have an indirect effect on attitudes through thoughts for subjects high in NC. To ensure the reliability of these effects, and obtain stronger evidence for multiple roles for positive mood in changing attitudes, a second experiment was undertaken with very different operations for each of the constructs.

In Experiment 1, the positive mood manipulation instructed subjects to engage in thought—to imagine and describe a positive event. It is possible that this rather thoughtful manipulation elicited irrelevant positive thoughts that interfered with biased processing of the message—especially for high-NC individuals. In Experiment 2, a positive mood induction was selected that did not explicitly require much cognitive activity. Instead, subjects were exposed to an episode of a television situation comedy. In the first experiment, elaboration was studied by using an individual-differences assessment—selecting people who varied in NC. In our second study, elaboration was examined not through individual differences but through an experimental manipulation designed to elicit high or low amounts of thinking. Finally, whereas Experiment 1 used a social issue, the critical message in Experiment 2 was an advertisement for a new product.

In sum, Experiment 2 was a conceptual replication of Experiment 1, with very different operationalizations of each of the independent variables. The hypotheses were identical, however. Positive affect was expected to influence attitudes under both high- and low-elaboration conditions, but positive mood was expected to modify attitudes through thoughts only when conditions favored elaboration.

Method

Subjects and Design

The design of the study was a 2 (mood: neutral or positive) × 2 (argument quality: moderately weak or strong) × 2 (issue involvement: low or high) between-subjects factorial. Participants were 160 students taking introductory psychology at a large midwestern university.

Procedure

When subjects arrived for the experiment they were randomly assigned to one of two adjoining laboratory rooms. Each room contained five cubicles facing a television monitor. Each cubicle was equipped with headphones and was constructed to prevent visual contact among participants. Subjects were told that the psychology department was cooperating with the journalism school and several commercial advertisers to study the attitudes of college students toward different kinds of television programs. In fact, the television program that subjects would see was manipulated so that half of the subjects (those in one of the lab rooms) watched a program that was designed to induce a positive mood. The other half of the subjects (in the other lab room) viewed a program that induced a neutral mood. One of the commercials embedded in the program served as the critical persuasive message, and it contained either moderately strong or weak arguments for an unfamiliar product, the “Maestro” pen from the (fictitious) Italian Pen Corporation.

Following explanation of the general purpose of the research, subjects were told that the commercial sponsors of the research would provide them with a small gift of appreciation at the end of the experiment. The nature of the gift to be provided was manipulated to create either high or low involvement with the critical advertisement.

Next, subjects donned their headphones and watched the appropriate television program along with the commercials it contained. The entire videotape ran for 30 min. The program subjects viewed contained three commercial breaks, with each break presenting three commercials. Each commercial was 30 s in length. The critical commercial was presented as the second one in the second program break (i.e., at about the middle of the program). When the program ended, subjects completed a questionnaire containing the attitude and other measures. Finally, all subjects were debriefed, thanked, provided with a small gift, and dismissed.

Independent Variables

Involvement. Before viewing the television program, subjects were told that at the end of the program they would be asked to make a selection from among several brands of a specific product, one of which would be advertised during the upcoming program. They were then provided with a sheet of paper that provided a brief description of the target product as well as several others. Because the critical ad was a commercial for the Maestro pen, in the high-involvement conditions subjects learned that for their free gift they would be able to select a writing implement from among several brands, one of which would be advertised during the program. In the low-involvement conditions, subjects were told that they would be able to select from among several brands of instant coffee, one of which would be advertised during the program. An ad for General Foods International coffee was included in the middle commercial break.

In addition to learning what product category their gift would be from, subjects also read brief descriptions of five products that would be advertised during the program. One of these descriptions was for the target product. In the high-involvement conditions, subjects read that the Maestro pen would soon be test marketed in midwestern cities including their own community. In the low-involvement conditions, subjects read that the pen would be test marketed in cities on the east coast. In sum, subjects in the high-involvement conditions were
led to believe that the target product would be available in their local area in the near future and that they would soon have to decide whether the target product should be selected over competing brands. In the low-involvement conditions, subjects were led to believe that the target product would not be available in their local area in the near future, and they believed that they would soon have to make a decision about a different product category. This manipulation has proven successful in influencing the extent of thinking versus reliance on simple cues in prior research (Pett, Cacioppo, & Schumann, 1983; Sanbonmatsu, Shawitz, & Sherman, 1991; Schumann, Petty, & Clemons, 1990).

Mood. Subjects who were randomly assigned to the positive mood condition viewed an episode of a popular television situation comedy program (the Cosby Show). Subjects assigned to the neutral mood condition viewed a segment from an informational program designed for medical practitioners (Cardiology Update). These programs were selected in a pretest in which subjects watched and rated various comedic and informational programs.

Argument quality. The strong and weak commercials for the target product, the Maestro pen, were created by editing a commercial for a pen that had run on cable television. In the commercial, an ink pen was thrown against a dartboard and then was used to write a message. Next, the pen was opened, revealing two cartridges. The commercial showed a pair of women’s hands carrying out the action. Although the visual portion of the commercial was constant for all subjects, the audio track was modified to produce versions that differed in persuasiveness. A retired professional announcer was employed to narrate the scripts. The three arguments in each commercial were selected on the basis of pretest ratings in which subjects were given a number of arguments for pens to rate on a strong-weak scale. The two versions of the arguments always focused on the same attribute, but the strong version indicated that the pen performed better than in the weak version. For example, in the strong message the announcer said that “in comparison tests with similar priced pens, the Maestro was rated far superior to its nearest competitors.” In the weak message the announcer provided more ambiguous information (e.g., “in comparison tests, consumers rated the Maestro comparable with other pens used at work or school”).

Dependent Measures

Recall. Immediately following exposure to the television program and commercials, subjects were asked to list all of the products and all of the brand names that they could recall. Following this, they were given a recognition test for the brand name in which they were asked to select the brand advertised from a list of seven familiar (e.g., Bic) and unfamiliar (e.g., Precision) alternative brands. If high-involvement subjects engaged in greater processing of the ad than low-involvement subjects, it was expected that they would show greater spontaneous recall of the pen commercial and the brand advertised than low-involvement subjects.

Attitude index. After the recall and recognition measures, subjects responded to several questions about the coffee product advertised and then completed measures regarding the Maestro pen. On three 9-point bipolar scales (−4 to +4), subjects rated the extent to which the Maestro pen was good–bad, satisfactory–unsatisfactory, and favorable–unfavorable. Responses to these questions were summed to create an attitude index that ranged from −12 to +12.

Thought index. After responding to the attitude measures, subjects were provided with seven spaces in which to list the thoughts they had while viewing the commercial for the Maestro pen. Because of time factors, subjects were not asked to rate their thoughts as in Experiment 1. Instead, two judges rated the thoughts as to whether they expressed positive, negative, or neutral sentiments. The judges were instructed to ignore thoughts that were clearly irrelevant to the commercial and product. To assess the reliability of the judges’ ratings, a random sample of 50 subjects was selected for comparison. The resultant Kappa coefficient of .98 in this sample (z = 11.14, p < .0001) suggested high reliability. The relatively few disagreements between judges were resolved by a third judge. Experiment 1 (see footnote 6) and previous research has shown that the valence ratings of trained judges are highly correlated with the subjects’ own ratings (see Cacioppo & Petty, 1981).

Manipulation checks. As noted previously, the recall measures were expected to be sensitive to differences in involvement. As an additional check on the implementation of this manipulation, subjects were asked to indicate what free gift they were expecting to receive at the end of the experiment. To assess argument quality, subjects were asked to rate the arguments they heard for the Maestro pen on a scale ranging from −4 (weak) to +4 (strong). Finally, to assess mood, subjects were asked to rate how they felt immediately after viewing the program on five scales ranging from −4 to +4. The scales (sad–happy, bored–interested, depressed–uplifted, tired–exhilarated, and angry–pleasant) were averaged to create a general mood index.

Results and Discussion

Manipulation Checks

The manipulation checks and other measures were subjected to a 2 (mood: neutral or positive) × 2 (argument quality: weak or strong) × 2 (involvement: low or high) between-subjects ANOVA. As expected if high-involvement subjects engaged in greater processing of the ads, subjects in the high-involvement conditions were more likely to freely recall that a pen commercial appeared during the program (90%) than were subjects in the low-involvement conditions (65%), F(1, 152) = 15.9, p < .0001. In addition, high-involvement subjects were more likely to recall the Maestro brand name (66%) than were low-involvement subjects (48%), F(1, 152) = 5.26, p < .02. On the recognition measure, subjects in the high- (87%) and low- (81%) involvement groups were equally able to select the brand name from among the seven listed (p > .25). When asked what free gift they were expecting at the end of the experiment, 82% of the subjects in the high-involvement condition correctly recalled that they would be selecting a brand of pen, and 91% of the low-involvement subjects correctly remembered that they would be selecting a brand of coffee. In short, subjects were aware of the appropriate target product, and the recall measures suggested that the involvement manipulation was successful in heightening attention to the critical advertisement. Yet, high- and low-involvement subjects had equal recognition of the product brand name.

Subjects who viewed the commercial containing strong arguments tended to rate them as stronger (M = 0.91) than subjects who viewed the commercial containing weak arguments (M = 0.37), F(1, 150) = 2.72, p < .05, one-tailed. Given that subjects had seen nine commercials by the time they completed this measure, it is not surprising that the effect observed for argument quality is smaller than in the pretest where responses were made immediately after exposure to the arguments.

Subjects who viewed the positive program (Cosby Show) rated their moods as considerably more positive (M = 3.0) than subjects exposed to the neutral program (Cardiology Update) who felt neither particularly positive nor negative (M = −1.2), F(1, 147) = 604.6, p < .0001.


**Attitudes**

The only significant effect to emerge in the analysis on subjects' attitudes toward the Maestro pen was the predicted main effect for mood, $F(1, 147) = 2.83, p < .05$, one-tailed. Subjects in a positive mood ($M = 6.11$) held more favorable attitudes toward the pen than subjects in a neutral mood ($M = 4.69$). As in Experiment 1, the absence of a Mood $\times$ Involvement interaction ($F < 1$) indicated that positive mood was equally effective in inducing more favorable attitudes under both high- and low-involvement conditions (see left panel of Figure 3).

**Thought Index**

The analysis on the proportion of positive thoughts generated yielded a significant Mood $\times$ Involvement interaction, $F(1, 147) = 4.25, p < .05$, providing a conceptual replication of Experiment 1. Separate analyses for high- and low-involvement conditions revealed that although positive mood had no impact on the proportion of positive thoughts generated under low-involvement conditions, $F(1, 73) = 1.42, p > .25$, positive mood increased the proportion of positive thoughts generated under high-involvement conditions, $F(1, 74) = 6.95, p < .01$ (see right panel of Figure 3).  

**Path Analyses**

As in Experiment 1, to further examine the impact of mood on thoughts and attitudes under high- and low-elaboration conditions, separate path analyses were conducted for the high- and low-involvement groups. The analyses were conducted with LISREL VI (Jöreskog & Sörbom, 1984) to simultaneously estimate the three paths depicted in Figure 4. We followed the same analysis strategy as in Experiment 1. In the first set of path analyses, the variables entered into the model were the dichotomous mood manipulation, the attitude index, and the proportion of positive thoughts generated. The first path coefficients in the right panel of Figure 4 present the results for the high-involvement conditions. For these high-elaboration subjects, there was no direct effect of mood on attitudes. However, manipulated mood had a significant effect on the proportion of positive thoughts generated, and the proportion of positive thoughts in turn affected attitudes. Under the low-involvement conditions (see first path coefficients in the left panel of Figure 4), positive thoughts still had an impact on attitudes, but thoughts were unaffected by mood. Instead, mood tends to have a direct impact on attitudes.

Next, we recomputed the path coefficients using the mood manipulation check instead of the manipulated variable. The results of these analyses were virtually identical (see second path coefficients in Figure 4). Consistent with Experiment 1, when involvement was high, the more happy subjects were, the more positive were their thoughts. As thoughts increased in positivity, so too did attitudes toward the product. Also consistent with Experiment 1, when involvement was low, the more happy subjects were, the more favorably they evaluated the pen, but mood had no effect on thoughts.  

**General Discussion**

Despite the many differences in procedure between Experiments 1 and 2, the results were remarkably similar and consistent with the hypotheses. Whether elaboration was studied by examining individual differences in NC (Experiment 1) or by manipulating subjects' motivation to think about the message through situationally induced involvement (Experiment 2), increasing positive mood led to more favorable attitudes toward the communication. This result held whether positive mood was induced with a pleasant imagination task (Experiment 1) or by exposing subjects to a television comedy (Experiment 2), and it held whether the persuasive message concerned an unfamiliar social issue (Experiment 1) or a new consumer product (Experiment 2).

Although on the surface, these results are not different from the many previous studies showing that positive mood can favorably influence attitudes (see McGuire, 1985), the experimental analyses of subjects' thoughts in each study and the subsequent path analyses suggested that positive mood can increase persuasion by different processes under high- and low-elaboration conditions. Specifically, when the likelihood of elaboration was high (i.e., high-NC subjects or high-involvement conditions), positive mood influenced the proportion of positive thoughts.  

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9 In addition to the Cosby Show and Cardiology Update, two other programs were tested in an attempt to provide an internal replication. Specifically, some subjects viewed an informational program that was rated most favorably in its category in the pilot testing (a National Geographic special on robotics), and some viewed a comedy program that was rated least positively in its category in pilot testing (an episode of I-40 Paradise from the Nashville Cable Network). Unfortunately, these programs showed only minimal differences on the mood manipulation check. Therefore, subjects exposed to these programs were excluded from the analyses. As might be expected from the increased sample size, inclusion of these subjects strengthened the significance of the manipulation checks for involvement and argument quality. For example, on the argument quality manipulation check, a main effect for argument quality emerged, $F(1, 299) = 4.83, p < .05$, as well as an Involvement $\times$ Argument Quality interaction, $F(1, 299) = 3.95, p < .05$. The interaction was consistent with the idea that high-involvement subjects attended to argument quality ($p < .01$) but that low-involvement subjects did not ($p > .50$). Importantly, inclusion of the subjects from the conditions in which the mood manipulation failed did not change the significance level of the mood main effect on attitudes, $F(1, 290) = 2.69, p < .05$, one-tailed, or the interaction of mood and involvement on the proportion of positive thoughts, $F(1, 299) = 4.10, p < .05$ (see also footnote 10).

10 The third path coefficients in Figure 4 present the path results obtained when the analyses were recomputed using the manipulation check data for the full sample (see footnote 9). The results remained the same. Analyses using the percentage of negative thoughts subjects listed produced a similar, though generally weaker pattern of results. For example, when using the manipulation check for mood in the path analyses (compare with the second path coefficients in Figure 4), low-involvement subjects showed a moderate direct path ($16, n.s.$) between mood and attitudes and a smaller effect of mood on thoughts ($-12, n.s.$). For high-involvement subjects, however, there was no direct effect of mood on attitudes $02$, but mood was significantly related to negative thoughts ($-38, p < .01$). In both cases, negative thoughts were related to attitudes, but the relationship tended to be stronger for high- ($-44, p < .01$) than for low- ($-29, p < .05$) involvement individuals.
thoughts generated, and path analyses indicated that mood had an indirect effect on attitudes through thoughts. That is, increased happiness was associated with an increased positivity in thoughts, and an increased positivity in thoughts was associated with an increased favorability in attitudes.

In contrast, when the likelihood of careful message processing was low (i.e., low-NC individuals or low-involvement conditions), positive mood had no impact on the proportion of positive thoughts generated despite having an effect on attitudes. In addition, path analyses indicated that mood had a direct effect on attitudes that was unmediated by thoughts. When elaboration was low, increased happiness was associated directly with more favorable attitudes. These results address the concern raised by Schwarz, Bless, and Bohner (1991) that the evidence for the view that affect could directly influence attitudes (unmediated by thoughts) came largely from research in which no persuasive communication was presented (e.g., Zanna et al., 1970). Because of this, Schwarz and colleagues questioned whether the peripheral cue role for affect was restricted to situations in which little content information was available. Although contemporary persuasion work has suggested that other cue effects (e.g., source attractiveness) are not confined to these situations (e.g., Chaiken, 1980; Petty, Cacioppo, & Schumann, 1983), the present research along with that of Batra and Stayman (1990) extends cue effects to positive affect.

Alternative Explanations: Can Thought Disruption Account for the Results?

As noted earlier, in the present research we took deliberate steps to decrease the likelihood of observing a processing disruption effect for positive mood. In fact, given the background conditions of our study (i.e., sufficient time to think about the message, neutral or unfamiliar topics rather than unpleasant ones, etc), the predictions of some theories of positive mood disruption would have been disconfirmed if we observed reduced processing under positive moods (cf., Mackie & Worth, 1989). Nevertheless, could mood disruption still pro-

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**Figure 3.** Left panel: Effects of mood on attitudes under low- and high-involvement conditions. Right panel: Effects of mood on the proportion of positive thoughts generated under low- and high-involvement conditions.

**Figure 4.** Direct and indirect effects of positive mood on attitudes under low- (left panel) and high- (right panel) involvement conditions. (The first path coefficient refers to analyses with the manipulated mood variable. The second path coefficient refers to analyses with the multi-item mood manipulation check. The third path coefficient refers to analyses with the mood manipulation check for the full sample [see footnote 10], *p < .10, **p < .05].)
provide an account for the present results even though we observed a main effect for positive mood on attitudes rather than an interaction of mood and argument quality? For example, if one assumed that all of the arguments used in the present research were relatively weak, and positive mood disrupted thinking about these weak arguments, then a main effect of mood on attitudes would be expected.\textsuperscript{11}

We do not favor a positive mood thought disruption explanation for our results for several reasons. First, an implication of the capacity theory of positive mood disruption is that it should be easier to observe a disrupting effect of positive mood if the background elaboration likelihood is relatively high rather than low. If the likelihood of thinking is already very low (e.g., because of a low-relevance message or low-NC individuals), then it would be difficult for positive mood to disrupt thinking further. That is, thought disruptors (e.g., positive mood, distraction, etc.) should have a greater impact on thinking when people are ordinarily motivated and able to think than when they are not (Pettig & Brock, 1981). Similarly, theories suggesting that positive mood reduces motivation to think would also expect the disruption effect to be more difficult to observe if the overall likelihood of thinking is already low because, again, it would be ineffectual for positive mood to reduce motivation to think further if it is already very low. Thus, thought disruption accounts of mood might have expected mood to interact with elaboration level in determining attitudes such that the positive mood disruption effect would be stronger under the high- rather than under the low-elaboration conditions. Yet, in the present research, positive mood produced the same impact on attitudes under high- and low-elaboration conditions.

In addition, the thought disruption theories of mood cannot account for the fact that mood influenced attitudes under both elaboration conditions but influenced thoughts only when the elaboration likelihood was high. If thought disruption was responsible for the effects under high- and low-elaboration conditions, thoughts should have been influenced by mood in both conditions, but they were not. In addition, the thought disruption explanation cannot account for the fact that the effect of mood on attitudes was mediated by thoughts under high- but not under low-elaboration conditions.

At best, the positive mood disruption explanation can provide an account for the effects observed under the high-elaboration conditions and only if one assumes that all of the message arguments were weak. Importantly, even if one accepts the thought disruption explanation for the results under high elaboration, the present research still shows that positive mood can influence attitudes in multiple ways. Specifically, in the current research, when the likelihood of careful message processing was low (i.e., low NC and low involvement), positive mood had an effect on attitudes that was unmediated by thoughts. When there was little thinking to disrupt, positive mood produced a relatively direct increment in overall favorability toward the issue. When the likelihood of careful message processing was high, however, the effect of positive mood occurred through its effect on thoughts. That is, positive mood either disrupted the production of unfavorable thoughts or enhanced the production of favorable thoughts or both so that the net positivity of thoughts and attitudes increased.

\textbf{Difficulties in Assessing Biased Message Processing}

We have argued that although the thought disruption hypothesis cannot account for all of the effects of positive mood observed in this research, it might provide a plausible account for the effects of positive mood under the high-elaboration conditions if we assume that the message arguments were weak. On the other hand, is there any unique evidence for biased processing under high-elaboration conditions? In the current research, we tracked biased processing by examining the profile of thoughts induced by a positive mood under high- and low-elaboration conditions. We found that positive mood influenced the net favorability of thoughts under high- but not under low-elaboration conditions and that the net favorability of thoughts mediated the impact of mood on attitudes under high- but not under low-elaboration conditions. Although these results are consistent with a biased processing interpretation of the high-elaboration conditions, they are not definitive because the processing disruption hypothesis would expect the same pattern under high elaboration if the message arguments were weak. That is, reduced processing of weak arguments should lead the profile of thoughts to become more favorable overall because the presumably dominant negative thoughts to the weak arguments would be disrupted.

Because of this, it would be useful to have some other means to distinguish favorably biased processing from disrupted objective processing. Petty and Cacioppo (1986) suggested that the argument quality manipulation might be useful in distinguishing relatively objective from relatively biased processing. In particular, variables increasing the extent of objective message processing over a low-elaboration control condition should produce a relatively symmetrical interaction with argument quality (assuming the arguments are pretested appropriately; see Petty & Cacioppo, 1986). That is, as relatively objective processing increases, strong arguments should increase in persuasiveness and weak arguments should decrease in persuasiveness. On the other hand, if a variable or combination of variables (e.g., positive mood combined with high involvement) is inducing enhanced processing that is favorably biased (rather than objective), the interaction with argument quality should be relatively asymmetrical. That is, because it is presumably easier to generate favorable elaborations of strong arguments than of weak arguments, as favorably biased processing increases over a low-elaboration control condition, strong arguments should increase in persuasiveness more than weak arguments.

If this asymmetrical interaction pattern was observed in the present research, confidence in the biased-processing interpretation of the high-elaboration results would increase. However, the asymmetrical interaction pattern described earlier was not

\textsuperscript{11}The mood disruption theories cannot account for the results, of course, if one assumes that the arguments were strong, neutral, or mixed rather than weak, because thought disruption should reduce or have no systematic effect on persuasion in these situations (Mackie & Worth, 1989; Petty & Cacioppo, 1986). We only observed enhancement effects for positive mood. One could go further and propose that all previous persuasion studies finding that positive mood enhanced persuasion used weak rather than strong arguments, though this seems unlikely.
obtained in either experiment. Unfortunately because the argument quality manipulation was deliberately weaker in these studies than in prior research (see footnote 2), subjects may have been equally able to generate positive thoughts to the different argument sets used in the present studies when they were highly motivated to process the arguments and were under the influence of a positive mood.

More generally, however, there may be practical difficulties in using the argument quality manipulation to assess biased processing. First, because biased processing should be fostered when the message arguments are relatively ambiguous, clearly strong and weak arguments should be less susceptible to any biasing effect. Thus, developing strong and weak arguments that are not so clearly compelling and specious as to inhibit biased processing, but that are also not so ambiguous as to render biased processing equally likely for both argument sets, may prove difficult. A second practical difficulty stems from the fact that the biased-processing effect is expected to occur mostly under high-elaboration conditions. Thus, a ceiling effect on the generation of positive thoughts to strong arguments (because of the high-elaboration conditions) could lead to the observation of a greater biasing effect of positive mood on processing weak rather than strong arguments.

The primary implication of our analysis is that although the argument quality manipulation has been an effective tool for assessing the extent of relatively objective message processing, it may not be as practical a tool for assessing the extent of biased processing or for distinguishing relatively objective from relatively biased processing. On the other hand, if in a given study, variable  A  produces a symmetrical interaction with argument quality whereas variable  B  produces an asymmetrical interaction with the same argument quality manipulation, this would be suggestive of the fact that variable  B  is inducing more biased message processing than variable  A . The absence of an asymmetrical interaction pattern, however, would not be sufficient to exclude biased processing as a possibility for the reasons outlined earlier.

Additional Questions for Future Research

Although the present research has established that positive mood can have a relatively direct impact on attitudes in some circumstances (low-elaboration conditions) and an indirect impact by influencing thoughts in other situations (high-elaboration conditions), the specific processes underlying these multiple roles for positive affect are not addressed by our two experiments. That is, as noted earlier, the present research does not indicate the specific impact that mood has on thoughts in the high-elaboration conditions. Positive mood could have increased the net favorability of thoughts under the high-elaboration conditions because positive mood disrupted negative thoughts, enhanced positive thoughts, or both. Net positivity of thoughts could have been increased by other mechanisms as well (see Petty & Wegener, 1991, for further discussion).

Similarly, the present research does not address whether the direct influence of positive mood under low-elaboration conditions is due to a simple association process as in classical conditioning or whether it is due to a relatively simple inference process as postulated by (mis)attribution theory (e.g., Schwarz & Clore, 1983, 1988), or retrieval of a learned heuristic as suggested by the heuristic/systematic model of persuasion (Chaiken & Stangor, 1987). Whichever formulation proves correct, however, it seems clear that the process by which affect modifies attitudes under low-elaboration conditions has little to do with mood influencing the thoughts elicited by the persuasive communication.

An additional issue worthy of further research concerns the temporal sequence of the effects observed here. One possibility is that because both high- and low-elaboration subjects expected to answer some questions following exposure to the message, they both formed attitudes toward the topic sometime during or shortly after message presentation. The process of attitude formation presumably differed for each group, however. Another possibility has been suggested by some investigators (e.g., Sanbonmatsu et al., 1991) who have argued that attitude changes through the central route or systematic processing occur sometime during the message presentation (i.e., are "online" judgments), but attitude changes through the peripheral route or heuristic processing only occur later when provoked by the attitude question and thus are more memory based (Hastie & Park, 1986). According to this view, low-NC and low-involvement subjects, who presumably did not process the message extensively during its presentation, may have formulated a judgment based on their moods only when provoked to do so following message exposure. A third possibility is that both high- and low-elaboration groups formed attitudes only when provoked by the attitude question. The difference would be that high-elaboration subjects engaged in thought before responding, and the subjects' current mood state influenced the nature of that thinking, whereas low-elaboration subjects simply relied on their present mood state in forming a judgment without formulating issue-relevant thoughts. Regardless of the specific timing of the judgments formed, the present research indicates that the processes responsible for the attitude judgments differed depending on the likelihood of careful message processing.

Finally, we note that the present research used topics for which subjects had very limited knowledge and for which no accessible negative (or positive) prior attitude was available. Furthermore, even though two kinds of arguments were used in the messages, with one set more persuasive than the other, the arguments were not unambiguously strong or weak. If a highly accessible unfavorable attitude was available to serve as a negative cue when the elaboration likelihood was low and to bias processing in an unfavorable manner when the elaboration likelihood was high, we believe that the effects observed in this research would be less likely to occur. Similarly, if we had used arguments that were unambiguously strong or weak, the effects we observed may have been attenuated (Chaiken et al., 1989; Petty et al., 1992). Future research that systematically varies these factors is necessary.

Conclusions

Despite some questions that remain, the present research has shown that a manipulation of positive mood can lead to more persuasion under two elaboration conditions. Furthermore, the role of positive mood appears to be different under each condition. When the elaboration likelihood was relatively high, posi-
tive mood influenced both thoughts and attitudes, but when
the elaboration likelihood was relatively low, positive mood
influenced attitudes but not thoughts. Interestingly, the magni-
tude of the positive influence of pleasant mood on attitudes was
the same under the high- and low-elaboration conditions. Even
though the attitudes were the same, however, prior research
suggests that the thoughtfully mediated attitude change is more
likely to persist over time and to be predictive of behavior (see
Eagly & Chaiken, 1993; Petty & Cacioppo, 1986; Tesser &
Shaffer, 1990, for reviews).

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