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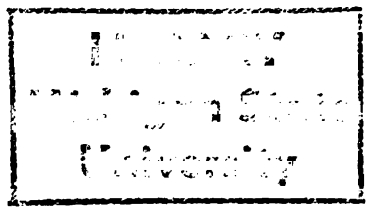

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RODNEY ALLEN REYNOLDS

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Major professor

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THE EFFECTS OF COGNITIVE ELABORATION, VALID ARGUMENTS, EVIDENCE, AND MESSAGE STYLE IN PERSUASIVE DISCOURSE

By

Rodney Allen Reynolds

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ABSTRACT

THE EFFECTS OF COGNITIVE ELABORATION,
VALID ARGUMENTS, EVIDENCE, AND
MESSAGE STYLE IN PERSUASIVE DISCOURSE

By

Rodney Allen Reynolds

The perspectives on reasoning, evidence, and message style are reviewed and held to be inadequate in providing sufficient grounds for predictions about message receivers' responses to persuasive messages which vary on argument validity, evidence strength, and message style. Based upon the thinking and the empirical research from the perspectives of reasoning, evidence, and message style in social influence a model of belief elaboration and attitudes in persuasion is advanced and tested.

The full model was not supported. Several secondary analyses, however, offered insight into the relationships proposed in the model. The most significant finding from the study was that the effect of evidence evaluation in persuasion was mediated by the receivers' evaluation of the message. There was some indication that receivers' evidence evaluations are a function of habitual cognitive efforts as well as actual cognitive elaboration on the message. Limited support was provided for the conclusion that the validity of the arguments in a message are detectable by receivers. The results of this study are uninformative about the role of message style in persuasion.

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The Effects of Cognitive Elaboration, Valid Arguments, Evidence, and Message Style in Persuasive Discourse

Introduction

Context of the problem

In 1967 Wayne Thompson reviewed the experimental studies on reasoning and evidence in discourse and concluded that the "experimental findings . . . provide almost no evidence against using sound evidence and arguments but not much support for employing them" (p. 53). Given the role that reasoning and evidence has played in both rhetoric and communication theory (see Arnold & Bowers, 1984), Thompson's conclusion deserves greater theoretic and empirical attention.

Reynolds and Burgoon (1983) provided a recent review of the advances in research on reasoning and evidence. Research conducted in the sixteen years between the Thompson review and the Reynolds and Burgoon review provides a substantial amount of support for the use of evidence in persuasive messages. Reynolds and Burgoon note, however, that the findings on the use of evidence lack theoretic bases and, therefore, offer little in the way of substantial explanations or predictions about the effects of specific types of evidence across or between situations, sources, or receivers.

Reynolds and Burgoon (1983) also note that the research on reasoning is more theoretically sophisticated than the research on evidence but, ironically, offers comparatively little in the way of empirical findings

on the use of sound arguments in persuasive discourse. For the most part, reasoning researchers have focused upon the ability to reach valid conclusions for syllogisms or other logical tasks which are typically presented in an objective test format. In short, much of the research on reasoning has been conducted outside of the context of communication.

In addition to the dearth of empirical research, extant studies have not adequately dealt with the effects of message style which may add to or interact with the effects of evidence and reasoning in persuasive messages. Clearly, stylistic elements in messages are important to the persuasion process. The rhetorical literature has stressed both reasoning and style. For example, Kauffman (1981) has argued that "since Aristotle, argument and poetic have been conceived of as interdependent types of discourse" (p. 407). From an empirical perspective Burgoon and Miller (1985) have pointed out that "even relatively minor variations in the linguistic and syntatic properties of a message can influence persuasive success." Further, Burgoon (1983) has argued that not accounting for stylistic variables in the study of persuasion can misguide both the conception and interpretation of empirical studies.

The importance of addressing questions about the impact of reasoning, evidence and message style in persuasion should not be underestimated. In some communication courses students regularly encounter exhortations to improve their knowledge of the criteria of logical adequacy because such criteria "constitute standards which [communicators] might well wish to apply when functioning as discriminating receivers of persuasive communications" (Simons, 1976, p. 192). These same students, however may

be informed that the study of logic is "as free from all practical concerns as in some branch of pure mathematics" (Toulmin, 1958, p. 2). In some courses students may hear pleas on the use of tests of evidence (e.g., McCroskey & Wheeless, 1976, p. 370-372) while also hearing that receivers are unable to apply these same tests (Harte, 1971). Similarly, communication students may be taught that a clear, concise and expressive linguistic style is important (e.g., Wilson & Arnold, 1978, p. 254) while also learning that vagueness, ambiguity and ornateness are suasory (Wilson, 1971; Williams & Goss, 1975; Williams, 1980; Brummett, 1981; Eisenberg, 1984).

Some may argue that the issues of what we teach and what we know to be effective merely split on what is versus what ought to be persuasive, however, following Hempel (1965), "to qualify a given action as rational is to put forward an empirical hypothesis and a critical appraisal" (p. 463). The same argument may be advanced for evidential support and message style. In short, before the traditional canons of message construction and reception are retired to a home for academic pedanticisms, they deserve greater theoretic and empirical exploration.

Fortunately, research on questions about the role of reasoning, evidence and message style in social influence have recently received renewed interest (e.g., Hample, 1977; 1978; 1979b; Sandell, 1979; Wyer & Hartwick, 1980; McGuire, 1981a; Fishbein & Ajzen, 1981; Jackson, 1982; Reynolds & Burgoon, 1983; Ray & Findley, 1984). These research efforts, however, have not been integrated.

The renewed interest in reasoning, evidence and style parallels a resurgent interest in cognitive processes among the social sciences (see Greene, 1984) and, in particular, persuasion (see Petty, Ostrom, & Brock, 1981). For example, some "cognitive response" researchers (e.g., Cacioppo & Petty, 1980b) have sought to extend the role of counterarguing in persuasion (for a review see Petty and Brock, 1981) by examining a broad range of thoughts generated by receivers in response to persuasive messages. Unfortunately, "there exists no 'definitive' theory of cognitive responses. Indeed, the cognitive response approach is more a conceptual orientation (or perhaps a statement of faith) toward the role of thought in attitude change and persuasion" (Ostrom, 1981, p. 287). Similar theoretic problems emerge with other perspectives on reasoning, evidence and style in social influence.

Statement of the Problem

Given the state of theory and research on reasoning, evidence and style, there is a need for the advancement and testing of a theoretically based model of the effects of persuasive messages which vary on the use of valid arguments, evidence, and message style. Further, such a model must address how cognitive elaboration (thinking) influences the effects of reasoning, evidence and style on receivers' responses to messages.

Perspectives on human reasoning in social influence

There are three major theories or models which address the issue of human reasoning in social influence situations. First, McGuire (1960a; 1981a), Wyer (Wyer, 1970; 1972; 1973; 1974; 1975; Wyer & Carlston, 1979; Wyer & Goldberg, 1970; Wyer & Hartwick, 1980) and Hample (1977; 1978;

1979b) have examined probabilogical models of belief change which McGuire and Wyer claim to represent both subjective probability and syllogistic reasoning processes. Second, Fishbein and Ajzen (1975; 1981; Ajzen & Fishbein, 1980) have advanced a "theory of reasoned action" which contains a presupposition that humans are rational. Third, Petty and Cacioppo (1981) offer an "elaboration likelihood model" of persuasion which is based on the assumption that human reasoning is idiosyncratic but that the role of subjective assessments of reasoning is central to persuasion. These perspectives, in general, are concerned more with the structure of cognitive processes than with the effects of persuasive messages.

Probabilogical equations

Theoretic ideas. The initial probabilogical equation of reasoning advanced by McGuire (1960a) is presented in Equation 1. McGuire claims that this equation captures both the process of probability assessments of the truth of propositions and the process of syllogistic reasoning. For McGuire, rationality amounts to a normative conformity to the standards of traditional logic and the principles of probability.

$$pC = pApB + pK + pD \qquad \text{Equation 1}$$

The pC term represents the individual's belief in the conclusion. The pApB term in the equation represents the individual's belief in the two premises of a syllogistic argument. The pK term represents all premises that the individual may consider in addition to pApB in assessing pC. The pD term represents the individual's desirability for pC. McGuire has referred to this desirability term as "wishful thinking" (McGuire, 1960a) or as "hedonic consistency" (McGuire, 1981a).

McGuire's probabilogical equation is an extension of the consistency theories (see Insko, 1967). Thus the equation is part of a more general theoretic structure in which it is assumed that:

1) People seek to maintain rational consistency.

2) Rational inconsistency is aversively motivating.

3) People will behave in ways calculated to restore rational consistency (cf. Miller, Burgoon, & Burgoon, 1984, p. 431).

McGuire (1960a) argues that other consistency theories suffer from either the denial of cognitive processes (by examining only behavioral consistency) or by such broad notions of consistency that the possibility of inconsistency is practically denied (see also Fishbein and Ajzen, 1975, pp. 6-8 for a similar discussion).

Wyer and Goldberg's (1970) modification of McGuire's original equation is presented in Equation 2:

$$pB = pA\ pB|A + pA`\ pB|A` \quad \text{Equation 2}$$

The pB term on the left side of the equation represents the conclusion of the two conditional arguments (for consistent references, however, hereafter the conclusion of any argument will be referred to as pC). The first term in the equation (pA pB|A) represents a conditional argument of the form: A; If A, then B. The second term (pK or pA` pB|A`)in both equations represents another conditional argument of the form: Not A; If not A, then B.

The two equations are basically the same. The first term in both equations differ only on the assumption of pA and pB being independent (pApB) or contingent (pA pB|A). Hample (1979b) points out that the

distinction is not logically or empirically important. The second term (pK or pA` pB|A`) in both equations represents the additional premises other than pA and pB an individual applies in the assessment of pC. McGuire (1960a), however, dropped the pK component on the grounds that it is probably randomly distributed across any population and impossible to measure. Wyer's (see Wyer & Hartwick, 1980) and Hample's (1977; 1979b) efforts to clarify and empirically assess the pK term tend to support McGuire's (1960a) implicit conclusion that pK is more error than systematic variance.

Despite Wyer's (Wyer & Hartwick, 1980) assertion that the insignificance of pK may be an artifact of the subject's lack of prior knowledge on the experimental message topics, there are grounds for concern that the pK term might subtract from our understanding about human reasoning and social influence. Specifically, the inclusion of the pK term may foster the construction of ex post facto accounts which would deny any explanatory power to the equations. For example, Hample (1977) advances Henle's (1962) argument that people tend to apply additional premises to convert conditionals into biconditionals to explain the potential effect of pK. (e.g., to decode "If A, B" as "If B, A" on the bases of knowing K). Such an assumed conversion is then used to claim that apparent errors in reasoning are quite logical. However, as Evans (1980) has pointed out, the conversion hypothesis may not be falsifiable since there will always be another possible premise conversion. To paraphrase Hemple (1965, p. 471), such accounts of rationality afford ground for believing that it would have been rational for a person to

apply an additional premise, but no grounds for believing that the person did in fact apply such a premise. Further, such accounts deny the possibility of rational inconsistency which is ironic in light of McGuire's (1960a) intention to make the notions of consistency and inconsistency more extensional.

Adequacy of the equations. Disregarding the problems with the pK term, the evidence is impressive that the first term in the equations maps the reasoning of respondents very well. Reviews of the probabilogical research by McGuire (1960a; 1981a), Wyer (Wyer, Carlston, & Hartwick, 1979; Wyer & Hartwick, 1980), Hample (1977; 1979b) and Fishbein and Ajzen (1975, pp. 169-181) have all reported correlations between predicted and obtained scores for the probability of belief in the conclusion which have ranged between .40 to .96. Cohen and Cohen (1975, p. 56) claim that such correlations are comparatively "large" within the social sciences. In short, this evidence supports the view that people do tend to maintain rational consistency.

Elaboration. A major use of the equations has been in the testing of the Socratic effect (McGuire, 1960a). That is, the hypothesis that merely asking people to think about their beliefs on a topic will cause these people to examine their cognitive organization and restructure that organization so that rational consistency is increased. There exists substantial empirical support for the Socratic effect (McGuire, 1981a). Wyer (Wyer & Carlston, 1979; Wyer & Hartwick, 1980) has argued that the Socratic effect involves not only a mere dwelling upon the cognitive structure but also an active elaboration about new connections between

beliefs. Therefore, in addition to demonstrating that people tend to maintain belief structures which approximate rational consistency, this research has demonstrated that cognitive elaboration about one's beliefs is related to the degree of rational consistency.

Attitudes and beliefs. One area of difficulty with the link between the probabilogical approach and most persuasion research is Wyer's (1974) and McGuire's (1981a) claim that distinctions between attitudes and beliefs are conceptually unimportant. They argue that both beliefs and attitudes represent a person's judgment of an object's membership in a cognitive category. "There is no a priori reason to assume that the factors that affect judgments of category membership depend upon the nature of the categories involved" (Wyer, 1974, p. 25). Hample (1978) has demonstrated that people are able to reason with affect statements in the same way that they are able to reason with belief statements. But, it seems doubtful that belief statements are processed or have the same impact that affect statements have.

While much could and should be written in criticism of the reduction of affect to assessment of truth (i.e., It is true that heroin is bad), it is sufficient for now to point out that such a move is inconsistent with McGuire's and Wyer's discussions of the importance of "wishfull thinking." If we are to take McGuire and Wyer at their words on the similarity of belief and attitude judgments, then we must conclude that the pD term becomes just another premise or set of premises for pC. Thus there would be no distinction between pK and pD. Such an equivalence, however, is not what they have advocated.

Given that pD is included in the discussions of the probabilogical approach and is measured in a manner similar to most attitude measures (by asking the respondent to assess how desirable a proposition is), we may conclude that attitudes do play an important role in the assessment of argument conclusions. McGuire (1960a, pp. 76-79; 1960b) explored the pD component of his equation and found that the correlation between pC and pApB increased when the effect of pD was partialled out. (In 1960a the increase was from .48 to .85. In 1960b the increase was from .74 to .96.) This finding is consistent with a host of research which has indicated that attitudes affect people's assessments of the logical validity of arguments (e.g., Janis & Frick, 1943; Morgan & Morton, 1944; Henle, 1955; Feather, 1964; Bettinghaus, Miller, & Steinfatt, 1970).

Application to persuasion. There is a major problem with the application of the probabilogical equations to questions about the use of valid arguments in persuasive discourse. The equations have not been developed sufficiently to offer insight into how people deal with illogical arguments. As McGuire (1960a, p. 101) states: "The tendency to maintain logical consistency among one's cognitions is neither nonexistent nor absolute." Nevertheless, most of the probabilogical research has been limited to examinations of rational consistency rather than the causes and effects of rational inconsistency.

Both McGuire (1960a; 1981a) and Wyer (1977; Wyer, Carlston, & Hartwick, 1979) have discussed the obvious need to incorporate nonlogical thinking postulates into their equations. The pD term, for example, is offered by McGuire (1960a) to represent the nonlogical thinking brought

about by wishful thinking. Unfortunately, the remaining nonlogical thinking postulates that have been proposed are not likely to be incorporated into the equations because they are so broad as to deny explanatory potential. For example, McGuire (1981b) employs his other nonlogical thinking postulates not to add to the predictive power of his ideas but rather to argue that "we have to resign ourselves to entering . . . an age of diminished expectations" (p. 51) for the effects of persuasive messages. Despite Wyer and McGuire's recognition of the need to deal with nonlogical thinking there has been little empirical exploration of the issue.

The lack of extensions of the probabilogical equations to deal with an individual's own illogical reasoning brings into question the utility of the equations for examining the effects of poor reasoning in persuasive messages. In fact, the research conducted with the equations has not systematically examined the effects of a source's reasoning at all. In most of the studies the research participants provided assessments of the probability of belief in the truth of the propositions. These assessments were then entered into the equation to test the fit between the equation and cognitive organization. The premises measured have typically comprised parts of deductively valid arguments only. In those studies where persuasive messages were encountered, the messages were designed to alter only one belief in the syllogistic structure to see if such changes brought about the cognitive reorganization predicted by the equation. Thus the first term of the probabilogical equations only maps logical cognitive processes rather than responses to arguments in messages.

If the equation, and the theory on which it is based is to have much further utility in the study of persuasion, attempts are needed to account for how people identify, process, and respond to the reasoning of others. While the research participants in these studies to date have demonstrated a tendency towards rational consistency, it is hardly reasonable to assume that all of the messages that they receive are rationally consistent. To mention one possibility; it would follow from the probabilogical equations that when receivers assess a message and note that the source's pApB term differs substantially from the pC term in an argument, the receivers should view the argument as rationally inconsistent. Such extension of the probabilogical equations, unfortunately, has not yet been offered.

Another major limitation of the probabilogical approach is that there is no indication of how message elements (i.e., style) affect persuasion. Based on the probabilogical literature, it is only intuitively plausible that variables such as message style would affect pD. Without a more explicit account of message content, the probabilogical equations are necessarily incomplete models of the persuasion process.

Despite the problems with the probabilogical approach to belief change, this conceptual and empirical research garners support for the notions that: (1) People tend to maintain rational consistency. (2) Cognitive elaboration is a key determinate of rational consistency. (3) Affective responses play an important role in the degree of rational consistency. The major limitation to the probabilogical approach is that it has yet to be extended to analyses of the way people respond to the reasoning, evidence use, or stylistic tactics of others.

The theory of reasoned action

Theoretic ideas. Fishbein and Ajzen's (1975; 1981; Ajzen & Fishbein, 1980) theory of reasoned action is typically summarized as a single regression equation:

$$B \sim I = w_1 A_B + w_2 SN \qquad \text{Equation 3}$$

The theory is based upon the notion that behaviors (B) are determined by one's behavioral intentions (I) which are in turn determined by the attitude toward the behavior (A_B) or the individual's subjective norm (SN). The attitude toward behavior is determined by the sum of the salient belief attributions (b) about the behavior multiplied by the evaluations (e) of these attributes ($A_B = \Sigma\, b_i e_i$). The subjective norm consists of normative beliefs (nb) that significant others think that a behavior should or should not be performed and the motivation to comply (mc) with the significant others ($SN = \Sigma\, nb_i + mc_i$).

Comparison to probabilogical structure. The theory of reasoned action is complementary to the probabilogical approach to belief change. In fact, Fishbein and Ajzen (1975; p. 396, p. 486; 1981, p. 349; Ajzen & Fishbein, 1980, p. 239) make explicit links to the probabilogical approach. These links, however, are limited to the claim that to the extent that beliefs can be derived through syllogistic reasoning the probabilogical equations are informative on the question of belief change. Perhaps because it is too obvious, Fishbein and Ajzen do not emphasize that both the A_B and the SN components of the theory are syllogistic in structure. The A_B component breaks down into reasoning such as:

pA or b: People who buy Miller beer, work hard.

pB or e: People who work hard are good.

pC or A_B: Therefore, people who buy Miller beer are good.

The SN component breaks down into reasoning such as:

pA or NB: My mother wants me to take birth control pills.

pB or MC: I am motivated to do what my mother wants.

pC or I: Therefore, I will take birth control pills.

Thus, the structure of the first term of the probabilogical equations is preserved in the theory of reasoned action.

It is necessary to point out that the SN component of the theory of reasoned action is apparently not a potent determinant of intentions (Petty, Ostrom, & Brock, 1981). Specifically, an examination of a number of studies reported by Ajzen and Fishbein (1980) reveals that SN and A_B are highly correlated and that SN has consistently added very little to the variance accounted for in intentions by the A_B component.

Observing that the structure of Fishbein and Ajzen's (1975) formulation admits syllogistic inferences in the formation of beliefs and is, in itself, probabilogical would seem to indicate that the formulation is based on Fishbein and Ajzen's contention that humans are rational. Fishbein and Ajzen, however, do not offer such an account. Instead, the formulations for both the A_B and SN components of the theory are based on Fishbein's (1967) extension of Tolman's (1932) and Edward's (1954) expectancy value theories (see Fishbein and Ajzen, 1975, pp. 30-32). Thus, the criterion for rationality under the theory of reasoned action appears to be the maximization of subjective expected utility rather than

valid reasoning structures. Hempel (1965, pp. 466-469) examined the explanatory potential of the expected utility criterion of rationality and concluded that such accounts are inadequate on the grounds that logically incompatible decisions can be held to be rational even if the potential utilities are known. Even so, Fishbein and Ajzen (1975) do not offer criteria for knowing what decision rules for maximizing subjective expected utility would count as rational choices. Moreover, the most recent accounts of the theory (Ajzen & Fishbein 1980; Fishbein & Ajzen, 1981) make no mention of the notion of subjective expected utility but continue to state that the theory is based on the presupposition that people are rational. The role and character of reasoning within the theory of reasoned action is, therefore, not exactly clear.

Discrepancy and facilitating factors. Fishbein and Ajzen's (1975) discussion of discrepancy and facilitating factors in persuasion compounds the difficulty of identifying the role of reasoning within the theory of reasoned action but may aid in isolating when the reasoning presented in a message is most likely to influence a person. Fishbein and Ajzen claim that the acceptance of a belief (pA) advocated in a message is influenced by the discrepancy (D) between the receiver's own belief and the perceived belief of the communicator and facilitating factors (f) in the communication event (pp. 462-509). The relationship between the variables is expressed in the following equation offered by Fishbein and Ajzen (1975, p. 464):

$$pA = (1 - D)^{1/f} \qquad \text{Equation 4}$$

Fishbein and Ajzen (1975) are very critical of discrepancy research on the grounds that traditional (social judgment theory) attitudinal discrepancy confuses belief discrepancy with facilitating factors (pp. 486-487). In other words, the conflicting reports (p. 469) on the relationship between attitudinal discrepancy and attitude change resulted from the conflicting forces of belief discrepancy and facilitation: As belief discrepancy increases, the acceptance of an advocate's claims decrease; as facilitation increases, the acceptance of an advocate's claims increases. Thus, the differing gradients reported in the attitude discrepancy research are not the result of pressure to assimilate (Sherif, Sherif, & Nebergall, 1965) or changes in the size of the latitudes of acceptance or rejection (Himmelfarb & Eagly, 1974) but, rather, between differences in uncontrolled facilitating factors or unclear specification of the target dependent variable (belief change).

Fishbein and Ajzen (1975) claim that the effect of a facilitating factor is an increase (or decrease) in "the person's confidence in his own belief" (p. 462). The facilitating factors are: source variables such as "credibility . . . attractiveness, sincerity, status, etc." (p. 462); receiver variables such as "persuasibiltiy, chronic anxiety, self esteem, sex, intelligence, etc., as well as situation and topic-related factors, such as acute anxiety, involvement, extremity of own position, uncertainty, and the receiver's information about or knowledge of the topic" (p. 463); and message variables such as "order of presentation, validity of supportive arguments, and emotional versus rational appeals" (p. 463). Unfortunately this list of facilitating factors is incomplete

and does not reflect Fishbein and Ajzen's (1975, p. 463) claim that many of these factors interact with one another in the formation of overall facilitation. Apparently, the facilitating factors exponent decreases the parsimony of the theory of reasoned action exponentially.

It is unclear what process the facilitating factors represent. They may be incentives which, within a message learning approach, reinforce (or inhibit) the adoption of the advocated arguments for a message conclusion. Or, the facilitating factors may represent wishful thinking (pD) which, from a probabilogical approach, represents nonlogical thinking. Or, these facilitating factors may merely be subpropositions of belief which lead to the adoption of premises which are, in turn, subpropositions of belief for conclusions. Fishbein and Ajzen suggest all three of these interpretations at different points in their discussion of facilitating factors.

Fishbein and Ajzen (1975) are also unclear on what process is elicited by belief discrepancy. The implicit assumption, however, appears to be that belief discrepancy provokes a defensive posture in which the message recipient defends his or her own belief. Presumably, the defensive posture gives way to persuasion when some facilitation factor(s) brings about a recognition by the persuadee that his of her own belief is indefensible or causes the persuadee to suspend judgment on or otherwise ignore the discrepancy and adopt the advocated position. In short, it would appear that discrepancy increases the degree of cognitive elaboration. On the other hand, it appears that facilitating factors can

be split into two categories: Those that aid the persuadee in resolving the discrepancy (presumably via learning or reasoning) and those that inhibit the degree of cognitive elaboration and evince compliance.

Attitudes and beliefs. Little doubt is left after reading Fishbein and Ajzen's (1975) first chapter that their theory is aimed at preserving and refining the distinctions between beliefs, attitudes, intentions, and behaviors that have muddled and confused other efforts (e.g., Rosenberg & Hovland, 1960) at studying mediating responses to messages. In specific, Fishbein and Ajzen oppose the view that attitudes consist of three components (affective, cognitive, and conative) on the grounds that such a multicomponent view masks the relationships between these variables and serves only to advance the idea that the attitude-behavior discrepancy problem results from the complexity of the attitude construct (Fishbein & Ajzen, 1975, p. 340). Implicitly, Fishbein and Ajzen have cogently acknowledged that claims of complexity merely beg the question rather than adding to explanation and understanding. (For other criticisms of the multicomponential view of attitudes see Miller, Burgoon, and Burgoon, 1984, and Zajonc, 1980).

From a probabilogical perspective, Wyer and Goldberg (1970) used the muddle and confusion about the multicomponential view of the attitude construct to argue that the distinction between attitudes and beliefs is inconsequential. In contrast, Fishbein and Ajzen have argued that beliefs, attitudes, and intentions are unique variables with specific relationships to each other and to behavior rather than mere components of a summative variable (see Dubin, 1978, p. 66-68).

It is these specific relationships that are important. Fishbein and Ajzen (1975, pp. 457-461) argue against the message learning hypothesis (Janis & Hovland, 1959; McGuire, 1968) that persuasion proceeds from cognition to affect to conation. (McGuire, 1968, proposed that the message learning process is a five step process involving attention, comprehension, yielding, retention, and action. In 1981b, McGuire expanded this five step sequence to twelve steps). Fishbein and Ajzen (1975) argue that cognition does not lead to affect but that cognition and affect are combined together in the formation of specific attitudes towards action. Zajonc (1980) and others (e.g., Wheeless, 1971; Love & Greenwald, 1978; Petty & Cacioppo, 1981) have noted that changes in cognition do not necessarily lead to changes in affect but that changes in affect tend to lead to changes in cognition.

A close examination of the A_B component of equation 3 reveals more of the difficulty with the link Fishbein and Ajzen draw between attitudes and beliefs. Their formulation states that an overall evaluative response towards a behavior is the sum of the result of specific attributions about the behavior and separate evaluation judgments of each of these attributes. Thus, the placement of an object (behavior) along an evaluative dimension is determined by the placement of each of the attributes of the object along that same dimension weighted by the person's strength of belief assessments that the object has each of those attributes. The resulting dimension, therefore, represents a collapsing or merging of all cognitive responses to one attitudinal dimension. Thus, while Wyer collapses all attitudes to belief judgments, Fishbein and Ajzen

collapse all belief judgments onto a single evaluative dimension. Indeed, Fishbein and Ajzen do not typically compute A_B from measures of beliefs and attribute evaluations but simply measure A_B with a set of traditional attitude measures (see Ajzen & Fishbein, 1980, appendix A and B).

A resolution of these competing approaches to dealing with beliefs and attitudes seems to have been offered by McGuire's (1960a) separation of rational consistency and wishful thinking (pD). That is, rather than attempting to reduce affect to just another form of belief or attempting to subsume all beliefs under affective expressions, McGuire (1960a) keeps the two variables as separate determinants of inference conclusions.

Elaboration. Fishbein and Ajzen equivocate on the importance of cognitive elaboration in human information processing. They frequently write that "the theory is based on the assumption that human beings are usually quite rational and make systematic use of the information available to them" (Ajzen & Fishbein, 1980, p. 5) and that they "do not subscribe to the view that human social behavior is controlled by unconscious motives or overpowering desires, nor . . . that it can be characterized as capricious or thoughtless" (Ajzen & Fishbein, 1980, p. 5). But, in the same publications, they write that they "do not mean to imply that prior to performing each and every action, people systematically scrutinize the determinants of their behavior. Rather, [they] view the processes involved as largely automatic or implicit and only in rare cases do we become fully aware of these processes" (Ajzen & Fishbein, 1980, p. 245). Such conflicting statements may be the result of

theoretic incompleteness with regard to reasoning and elaboration. Nevertheless, these conflicting statements and the discussion of discrepancy and facilitating factors indicates that under the theory of reasoned action, it may be presumed that the degree of elaboration engaged in varies across persuadees and persuasive messages.

Application to persuasion. Fishbein and Ajzen (1981, pp. 347-349) explicitly argue that effective persuasive messages must contain rational arguments and evidence in support of a specific "primary belief underlying the target variable" (p. 348). (For example, see their discussion of McCroskey's, 1969, review of the evidence research.) In contrast, Wyer (e.g., Wyer & Hartwick, 1980) and McGuire (1981a) do not deal with message construction beyond the indication that a message which changes the belief in a premise will affect beliefs in a conclusion that receivers derive from that premise. Fishbein and Ajzen (1981) are convinced that "one of the problems in research on communication and persuasion is that arguments are usually selected, not on the basis of a systematic and empirically validated theory, but quite arbitrarily on the basis of intuition and often fallacious assumptions [such as the idea that a global attitude should determine a specific action]" (p. 349).

Unfortunately, Fishbein and Ajzen are not very explicit on how their theory would provide a basis for the selection of arguments or evidence beyond the contention that the arguments and the evidence must be related to a "primary belief." For instance, Fishbein, Ajzen and McArdle (1980) report the results of McArdle's dissertation on the effects of fear appeals to illustrate the application of the theory of reasoned action for

the selection of arguments. The results of the study were that a reasoned action fear appeal was most effective in changing attitudes and behavior, followed in effectiveness by a reward appeal, while a traditional appeal resulted in a boomerang effect on beliefs, attitudes and behaviors concerning the recommended action. Since the appeals all offered the same arguments, the differences between the traditional appeal and the reasoned action appeal are attributable to the manipulation of the specificity (and frequency) of references to the recommended action rather than the arguments per se. Thus, while Fishbein and Ajzen argue for messages with reasoning and evidence which have been derived from theory, it is not clear how the arguments selected for this study were based on a theoretic rationale.

While there remain several conceptual difficulties with the theory of reasoned action, the theory tends to support the ideas that: (1) People employ rational thinking processes when processing messages (albeit, rationality is yet undefined within the theory), (2) Cognitive elaboration is positively related to the belief discrepancy between a source and a receiver, (3) Many individual differences and message elements influence a receiver's confidence in his or her own beliefs which, in turn, holds an impact for how the receiver processes the arguments in the message (presumably, confidence in one's own beliefs is negatively related to message elaboration). In addition, Fishbein and Ajzen (1975; 1981; Ajzen & Fishbein, 1980) certainly encourage further exploration of the effects of arguments, evidence and message style in persuasive messages.

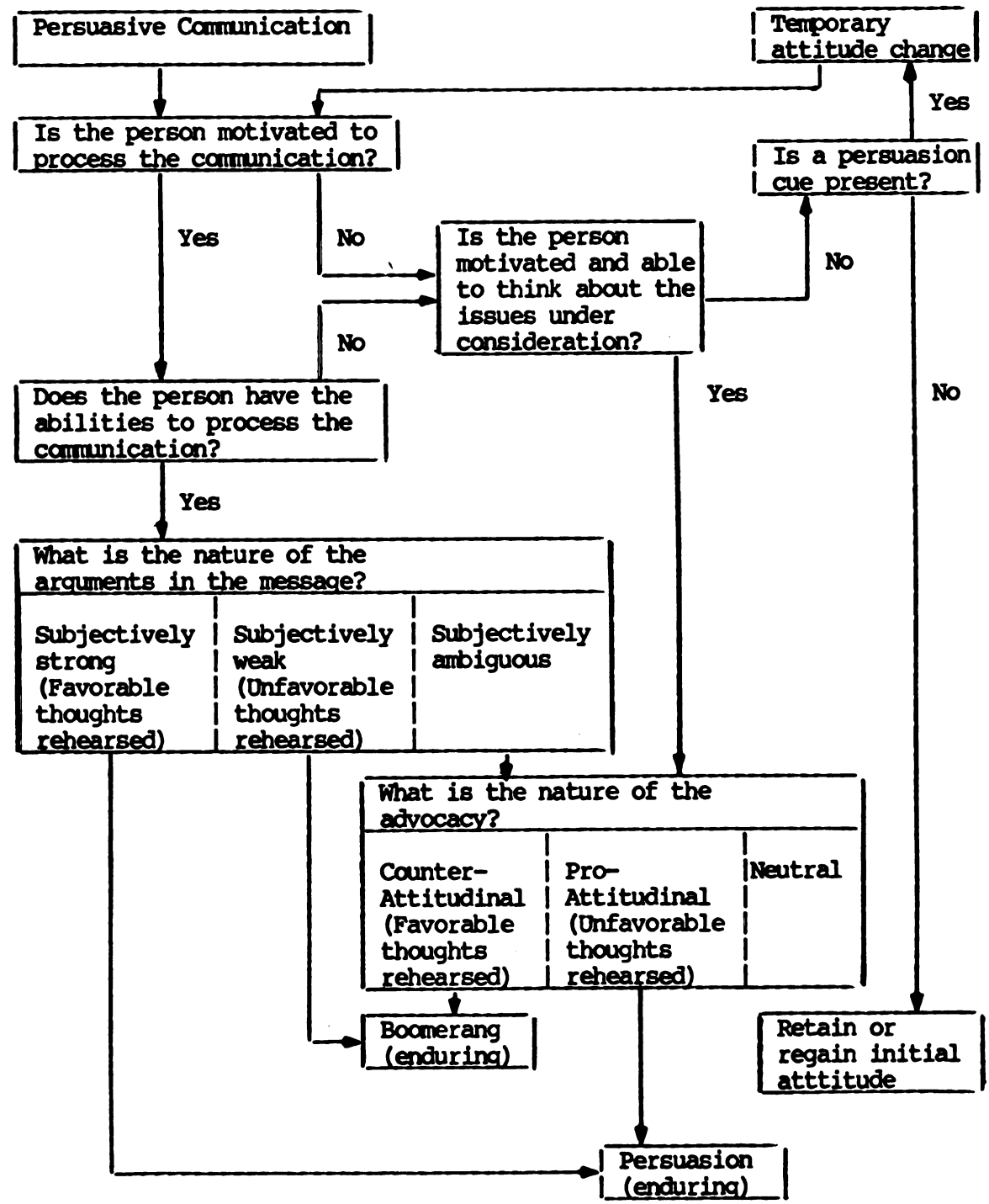
Elaboration likelihood model

Conceptual ideas. Petty and Cacioppo (1981) offer an "elaboration likelihood model" (see Figure 1) of the persuasion process which they claim to be an extension of the cognitive response approach to persuasion (see Petty, Ostrom, & Brock, 1981) and an integration of previous theories of persuasion and attitude change. The major assumption underlying the model is that: The more a person elaborates on the issues presented in a persuasive message, the more likely persuasion will occur and the more enduring the resulting response will be.

The model represents two routes to persuasion: A "central route" and a "peripheral route" (Petty & Cacioppo, 1981, chapter 9). The central route has two lanes in the same direction: The receivers' elaboration on the message arguments or the receivers' elaboration on their own arguments related to the issue of concern. In either case, elaboration is determined by the person's motivation (e.g., involvement) and ability (e.g., prior knowledge, self awareness) to elaborate on the issue. The peripheral route involves persuasive factors (e.g., speaker credibility), not immediately relevant to the issue, which "cue" a temporary attitude shift.

Elaboration. While Petty and Cacioppo (1981) place a great deal of emphasis on the concept of elaboration, they never seem to define it. At some points in their discussion of the elaboration likelihood model they use phrases such as "elaborated upon (thought about)" (p. 263). At other points in their discussion, they use the phrase "the process of

Figure 1
Elaboration Likelihood Model



elaboration (cognitive responses)" (p. 265). Unfortunately, there is also some confusion in the cognitive response literature over what the term cognitive response means.

As originally defined by Greenwald (1968), a cognitive response to a persuasive message consists of "(a) [the] degree of acceptance versus rejection of the position advocated in the communication, and (b) [the] intensity, or vigor, of [the] response" (p. 20). Later articles on the subject, however, tend to broaden the concept substantially. For example, Cacioppo, Harkins, and Petty (1981) claim that "a cognitive response refers to a unit of information pertaining to an object or issue that is the result of cognitive processing" (p. 37). In the same volume of articles, Petty, Ostrom, and Brock (1981) claim that "a cognitive response includes all of the thoughts that pass through a person's mind while he or she anticipates a communication, listens to a communication, or reflects on a communication" (p. 7). And, in the same volume, Greenwald (1981) states that "cognitive responses constitute a silent internal communication on the part of an audience member . . . [which] is assumed to mediate the effect of the (external) communication on subsequent opinion" (p. 128).

Petty and Cacioppo's (e.g., 1977) early operationalization of elaboration also substantially confused the definition of elaboration. Drawing upon previous usage of the thought listing technique for measuring counterarguing (see Miller & Baron, 1973), Petty and Cacioppo operationalized elaboration as the number of favorable or the number of unfavorable thoughts listed in response to a message. The splitting of

listed thoughts into favorable or unfavorable categories further confounds elaboration with attitudes. Greenwald (1981) points out that correlations between favorable and unfavorable thought listing counts and attitude measures are so extremely high as to create suspicion that the same construct is being measured. Indeed, Greenwald points out, some attitude researchers have used thought listing as an alternative measure of attitudes. Similarly, Fishbein and Ajzen (1981) have observed that "counterarguing and derogation may sometimes be correlates or consequences, rather than antecedents, of acceptance and yielding" (p. 354). Clearly, the splitting of listed thoughts into favorable and unfavorable categories goes beyond indicating the amount of thought engaged in by message receivers. Moreover, studies which examine the relationships between favorable and unfavorable thoughts with attitudes may be guaranteed significant (albeit uninterpretable) results.

Fortunately, Petty and Cacioppo's more recent research has moved away from tying elaboration to thought listing by examining individual differences such as issue involvement (Petty, Cacioppo, & Schuman, 1983) or "need for cognition" (Cacioppo, Petty, & Morris, 1983) as predictors of message elaboration and employing manipulation checks on the amount of cognitive effort extended while processing the persuasive messages. Indeed, Cacioppo, Petty, and Morris (1983) discuss message elaboration not in terms of the number of thoughts but, rather, in terms of "greater scrutiny of the information," "effortful thinking" (p. 806) and deliberation.

Petty and Cacioppo's (1981) emphasis on elaborative responses to persuasive messages is based upon both empirical research and scholarly conceptions of cognitive processes. The conceptual bases include, for example, Kelman's (1961) distinction between internalization, identification, and compliance. Petty and Cacioppo (1981, p. 268) claim that since internalization involves the acceptance and integration of new information into the person's belief and attitude structure, internalization represents an elaborative response and, therefore, is descriptive of the central route to persuasion. Petty and Cacioppo claim that identification and compliance are descriptive of the peripheral route to persuasion since these processes do not involve a consideration of arguments on the issue or a cognitive reorganization and are only effective when the source of the message is present or salient (i.e., the attitude change is temporary). Similarly, Petty and Cacioppo (1981, p. 268) claim support for their central and peripheral routes by referencing a list of scholars who have proposed two types or levels of human thought.

Additionally, Cacioppo and Petty (1982; Cacioppo, Petty, & Morris, 1983; Cacioppo, Petty, & Kao, 1984) have recently included Cohen's (1957; Cohen, Stotland, and Wolfe, 1953) work on need for cognition (i.e., the disposition to "tend to engage in and enjoy effortful analytic activity," Cacioppo, Petty, & Morris, 1983, p. 806) as conceptual support for the notion of elaboration. Obviously, while there are a number of conceptual perspectives on cognitive processes which tend to support the view that there are different types or levels of cognitive responses to messages, all of these conceptions do not reduce to elaboration vs. nonelaboration

as Petty and Cacioppo seem to suggest. Nevertheless, Petty and Cacioppo have offered evidence that there is some conceptual support for the exploration of elaborative responses.

There is some empirical support for the proposition that elaboration is a potent factor in persuasion. Petty and Cacioppo (1981) are quick to point to the research on distraction and resistance (e.g., Petty, Wells, Brock, 1976), counterattitudinal advocacy or role playing (see Miller & Burgoon, 1973; Janis & Mann, 1977), and forewarning (see Cialdini & Petty, 1981) to support their emphasis on elaboration.

Specific studies of elaboration, however, are sparse. Love and Greenwald (1978) asked subjects to read a persuasive message, write out one sentence reactions to the three main arguments in the message, and fill out recall and attitude measures. On both immediate and delayed posttests, the subjects' recall of their own reactions was correlated with their new attitudes while recall of the message arguments was not correlated with their new attitudes (pretest attitudes were partialled). Petty (1977) demonstrated that subjects' recall of their own thoughts to arguments on raising the driving age to twenty-one predicted attitude change on both immediate and delayed posttests while recall of the "strong" (vs. "weak" or "neutral") message arguments predicted attitude change on only the immediate posttest. These studies provide empirical evidence that elaboration is important to persuasion.

Research on factors that predispose elaborative responses provide the most convincing evidence that elaborative responses to messages are a potent determinate of persuasion. Cohen (1957) demonstrated that subjects

who scored higher on need for cognition were less affected by order effects in persuasive messages. Petty and Cacioppo's examinations of "argument quality" and elaboration determinants such as issue involvement (e.g., Cacioppo, Petty, & Schuman, 1983), need for cognition (Petty, Cacioppo, & Morris, 1983) or elaboration enhancement such as message repetition (Cacioppo & Petty, 1980a) and elaboration inhibitors such as distraction (Petty, Wells, & Brock, 1976) have all resulted in an elaboration by argument quality interaction such that the greater the elaboration likelihood, the more positive the attitudes for messages with "strong arguments" and the less positive the attitudes for messages with "weak arguments." In other words, argument quality influenced attitudes only when elaboration likelihood was high.

Unfortunately, these studies tell us nothing about the types of arguments that are persuasive. Petty, Wells, and Brock (1976) conceptually define argument quality as "difficult to counterargue." Operationally argument quality is typically defined "such that 'strong' arguments elicit more favorable than unfavorable statements, as assessed by the thought-listing technique . . . and 'weak' arguments elicit more unfavorable than favorable thoughts" (Cacioppo, Petty, & Morris, 1983). In addition, the specific strong vs. weak arguments employed in the studies have varied on content, structure, support, recency, relevance, complexity and absurdity. A typical example can be found in Cacioppo, Petty, and Morris (1983) where the strong version of an argument for a tuition increase was that classrooms were overcrowded. The weak version of the argument was that the road to the new campus sports arena was

overcrowded. This lack of control of argument relevant variables casts doubt on what can be interpreted from these studies about the effects of argument quality. Further, the conceptual and operational definitions of argument quality presuppose prior knowledge of what would persuade an audience and are, therefore, not theoretically useful for initial audience analysis, message design (i.e., prediction) or explanation of persuasion. Still, if viewed in the light of formative exploratory research, these studies suggest that argument quality and message elaboration are important to the persuasion process.

Peripheral route. Petty and Cacioppo (1981) are not very clear about the peripheral route and how it operates. Their discussion of the theories of persuasion which they claim to be linked to the peripheral route, indicates that multiple processes may be involved and that a peripheral cue may be shifted to central route elaborative processing (see Petty, Cacioppo, & Schumann, 1983, p. 143). Obviously, without an explicit account of the peripheral route, many persuasive effects can be cast teleologically into either the central or peripheral routes on the basis of the degree of cognitive effort reported or how enduring the response is.

There are relatively few studies conducted by the Cacioppo and Petty research team which address the nature of the peripheral route. Petty, Cacioppo, and Schumann (1983) examined issue involvement (operationalized as probability of being immediately affected), argument quality, and celebrity vs. noncelebrity endorsements ("professional athletes" vs. "Bakersfield California") and found that highly involved subjects' (i.e., predisposed to elaborate) postmessage attitudes were most affected by

strong arguments while low involved subjects' postmessage attitudes were most affected by celebrity endorsements. In a study of information processing strategies, Cacioppo, Petty, and Sidera (1982) suggest, but do not test, the idea that persons predisposed to elaborate tend to veridically evaluate message content and structure while persons not predisposed to elaborate merely attempt to place message content within their preexisting cognitive schemata.

The comparisons between Petty and Cacioppo's (1981) central and peripheral routes with McGuire's (1960a) rational and wishful thinking seem obvious. The main distinction seems to be that while McGuire (1960a; 1981a) assumes that rational and wishful thinking simultaneously contribute to the generation of a person's response to a message, Petty and Cacioppo (1981) assume that each of the processes are unique to individuals, persuasive messages, and stages of the persuasive process (see also Stiff, 1986).

Application to persuasion. The elaboration likelihood model has some intuitive appeal and, at first glance, is even exciting, given Petty and Cacioppo's (1981) claim of integrating much of the established theory and research on persuasion. At second glance, however, the model gives rise to many more questions than it answers. Nevertheless, the research conducted under the elaboration likelihood model supports the conclusion that what persuadees think (or do not think) about a persuasive message, particularly their reactions to the arguments in the messages (Love & Greenwald, 1978), is more important to persuasion than what they remember

about the message itself. The elaboration likelihood model, however, does not specify what reactions are important or how an advocate might elicit such reactions.

Despite theoretic and empirical problems in the research, the consistent reports by Petty, Cacioppo and their associates that the influence of argument quality depends on the amount of cognitive effort extended while processing a persuasive message affords grounds for a reexamination of Thompson's (1967) concern about the effects of the traditional standards of argument quality (i.e., sound arguments and evidence). Similarly, the thinking and research on the peripheral route to persuasion suggests that message elements not directly related to the message arguments (e.g., message style) may produce effects which are more ephemeral and are mediated more by the receiver's affective response to the message than by a thoughtful consideration of the message arguments.

Summary of the perspectives on human reasoning in social influence.

While there are many differences in both conceptual assumptions and empirical bases for the probabilogical, reasoned action and elaboration likelihood perspectives on human reasoning in social influence, the similarities seem much more important. All three perspectives contain the assumption that human reasoning is central to the effects of persuasion. Two of the three perspectives (probabilogical and reasoned action) contain the assumption that human reasoning is rational. Two of the perspectives (reasoned action and elaboration likelihood) contain the assumption that sound arguments and evidence should be more persuasive than unsound arguments and faulty evidence. Two of the perspectives (probabilogical

and elaboration likelihood) advance the notion that cognitive elaboration is important to the effects of reasoning in persuasion. All three perspectives contain some account of how nonargument or extra-argument relevant variables may affect persuasion. Unfortunately, all three perspectives offer incomplete accounts of what types of, or how, reasoning, evidence and message style affects persuasion. Nevertheless, the general themes and ideas from the perspectives on human reasoning in social influence appear to be integrable into a theoretic model that may account for reasoning, evidence and message style.

A model of belief elaboration and attitudes in persuasion.

Despite the unwieldy number of variables discussed in the writing on the probabilogical, reasoned action and elaboration models of persuasion, there are a relatively few number of key concepts and relationships that emerge as significant to advancing a speculative model to aid in the understanding of the role of elaboration, reasoning, evidence and style in persuasion. Among the key concepts, the notion of cognitive elaboration seems to be fundamental.

Elaboration has been referred to mainly as "thinking" (Petty & Cacioppo, 1981) or "effortful thinking" (Cacioppo, Petty, & Morris, 1983) and operationally defined in terms of a self perception measure of cognitive effort (Cacioppo, Petty, & Morris, 1983) while processing a persuasive message. It is implicitly assumed that when a message recipient engages in elaboration about a message, the recipient employs some degree of discriminative skills (cf. Siegel, Miller, & Wotring, 1969) in the "scrutiny of information" (Cacioppo, Petty, & Morris, 1983). Thus

a plausible assumption is that when persuadees elaborate on a message they engage in some assessment of the arguments and evidence in the message. If so, then the greater the degree of elaboration on a message, the greater the likelihood of detecting reasoning or evidence errors in the message.

There are undoubtedly many potential antecedents to the degree of elaboration engaged in while processing a message. Petty and Cacioppo's work has identified several individual differences (e.g., need for cognition, issue involvement), message variables (e.g., distraction, rhetorical questions), and source credibility as potential antecedents of elaboration. The review of Fishbein and Ajzen's (1975) work leads to the speculation that belief discrepancy and confidence in one's own beliefs are antecedent to message elaboration. In addition, the evidence presented by McGuire (1960a; 1960b) on the reduction of rational consistency prompted by the desirability of an argument conclusion suggests that a respondent's attitude toward the advocated belief is antecedent to message elaboration.

An attempt at synthesizing across the potential antecedents of message elaboration seems to be an overly ambitious task, and perhaps premature, in light of the formative stage of research and thinking on message elaboration. For now, it seems sufficient to conclude that: (1) There are individual differences which predispose message elaboration; and, (2) the attitude held for the advocated belief tends to be negatively associated with message elaboration. In pursuing these links, future research should be directed at message differences which might affect message elaboration.

The link between elaboration and belief change implied by Petty and Cacioppo's (1981) elaboration likelihood model is mediated by the persuadee's evaluation of the message arguments. The nature of this evaluation, however, has not been specified. At some points in their discussions of the model, Petty and Cacioppo (e.g., 1981) indicate that it is the reactions specific to the message arguments that are important. At other points in their discussions (see, in particular, Cacioppo, Petty, & Morris, 1983) they indicate that is is the more global impression of message effectiveness that is important to persuasion.

Since it is assumed that people differ on the degree of message elaboration, it would seem untenable to expect that those who elaborate less are likely to form reactions specific to the message arguments. On the other hand, message receivers are likely to form global impressions of message effectiveness regardless of the degree of message elaboration. Thus, it seems consistent with much of Petty and Cacioppo's work to suspect that those who tend to elaborate more on messages base their evaluations of messages on specific reactions to the message arguments (i.e., detection of reasoning or evidence errors). For those who tend to elaborate less on messages, the research on the effect of attitudes on reasoning judgments (e.g., Janis & Frick, 1943) would suggest that their evaluation of a message is likely to be based on their attitude toward the persuasive thesis.

On the basis of the thinking and research reviewed above, the following propositions emerge as the basis for a model of belief elaboration and attitudes in persuasion:

Proposition 1: The greater the predisposition to elaborate, the greater the likelihood of elaboration on a message.

Proposition 2: The more positive the attitude towards a message, the lower the likelihood of elaboration on the message.

Proposition 3: The greater the degree of elaboration on a message, the greater the detection reasoning errors in the message.

Proposition 4: The the greater the detection of reasoning errors, the lower the message evaluation.

Proposition 5: The more positive the attitude towards a message, the higher the message evaluation.

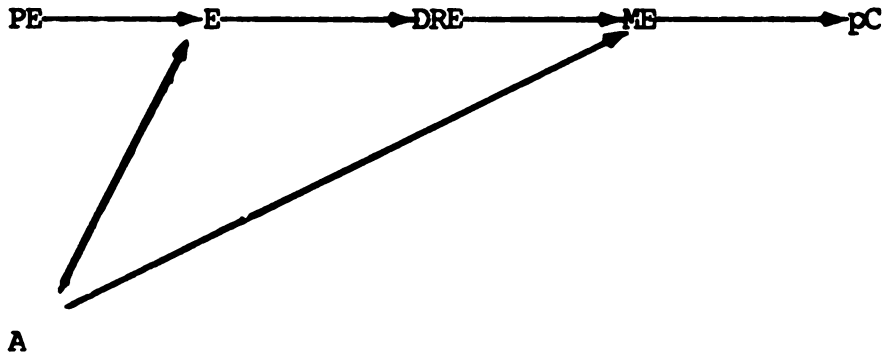
Proposition 6: The higher the message evaluation, the greater the likelihood of belief change.

While these initial theoretic ideas are admittedly more analytic than synthetic (empirically grounded), they appear to be consistent with much of the thinking on human reasoning in social influence. The relationships between these variables is summarized in the path model presented in Figure 2. Employing this model as a base, potential predictions for the effects of message style, reasoning and evidence may be developed in a more systematic manner than has been previously afforded by the research on human reasoning in social influence.

Elaboration and Logical arguments. As noted earlier, there is a paucity of empirical research which compares valid and invalid arguments in persuasive messages. Indeed, an extensive search has failed to discover a study which has directly compared the persuasive effects of

Figure 2

A Model of Belief elaboration and attitudes in Persuasion



Where: A = attitude.

DRE = detection of reasoning errors.

E = elaboration.

ME = message evaluation.

pC = probability of belief in the conclusion of the message.

PE = predisposition to elaborate.

valid arguments and invalid arguments in messages. There are studies of 'logical' and 'emotional' messages but, as Becker (1963) has noted, the conception of 'logic' vs. 'emotion' in these studies is flawed and the operationalizations of logic are typically not what a logician would classify as logical. There is also a growing body of research and theory on human reasoning ability (for reviews see Miller, 1969; Wason & Johnson-Laird, 1972; Hample, 1979a, Evans, 1980; Reynolds & Burgoon, 1983) which is variously interpreted as showing that human reasoning is or is not logical (cf. Hample, 1979a, with Evans, 1980). In addition, McGuire (1960a; 1981a), Wyer (see Wyer & Hartwick, 1980) and Hample (1977; 1978; 1979b) report a number of studies in which logical consistency predictions for persuasive messages were tested and supported. The findings are, however, limited since logical arguments were usually not manipulated or the control groups received "no-communication" rather than messages with invalid arguments. Clearly, many questions about the effects of valid arguments in persuasive discourse remain unanswered.

For the model of belief elaboration and attitudes in persuasion it is presumed that the elaboration process involves some form of reasoning and that the reasoning involved approximates logical forms of thought (see Appendix A). If people tend to reason in rational ways when, in fact, they engage in elaboration, then it may be assumed that they are likely to detect errors in their own reasoning as well as in the reasoning of others. Thus, if a message recipient does indeed elaborate on the message and the message contains errors in reasoning, then the recipient is likely to detect the errors and discount the message arguments when evaluating the persuasive message.

Evidence and elaboration. Given the empirical support for expecting that the use of evidence in persuasive messages will aid persuasion (see Reynolds & Burgoon, 1983) and the need for a theoretical explanation of that affect, it is appropriate to examine how the model of belief elaboration and attitudes in persuasion might account for the effects of evidence.

Miller (1966) defines evidence as "those data that are intended to induce a sense of belief in the propositions which the data purportedly support" (p. 25). McCroskey (1982) has proposed that there are three types of data: First-order, second-order, and third-order. First-order data are those beliefs which are held in common by both communicator and receiver. Second-order data are those beliefs held by the communicator but not necessarily held by the receiver (in other words, "source assertions"). Third-order data are those beliefs which are obtained from a source independent of the communicator or the receiver. McCroskey limits the use of the term 'evidence' to third-order data. Most of the research on evidence in persuasion tends to examine third-order data.

There are a few studies (Harte, 1977; Kline, 1971a; 1971b; Fleshler, Ilardo, & Demoretcky, 1974; Bradac, Sandell, & Wenner, 1979) that have examined the ability to detect violations of evidential standards. While the conclusions are generally negative, each of the studies report that people are better at detecting some violations more than others. It is worth note, however, that low dogmatics (Kline, 1971b) and field-dependent persons (Fleshler et al, 1974) are better at employing evidential standards than high dogmatics and field-independent persons. Moreover,

Luchok and McCroskey (1978) report that when evidence is attributed to a source who is not qualified to comment on an issue, and when the actual content of the evidence is irrelevant, an advocate (particularly one with low-to-moderate credibility) will find his or her audience changing in a direction opposite from that advocated. Perhaps dogmatism and field dependence are related to message elaboration. Petty, Cacioppo, and Schuman (1983, p. 143) have previously proposed that speaker credibility influences message elaboration. Thus it appears that the effects of evidence in persuasion are more likely to occur when persuadees engage in message elaboration.

Message style, attitudes and elaboration. Style is typically defined as a characteristic way of making linguistic choices. Sandell (1977) attempts to limit style to nonsemantic linguistic choices but finds that qualification difficult to maintain when specific stylistic tactics such as message intensity or metaphors are considered. Indeed, style is often discussed in broad terms. Norton (1978), for example, advances the concept of "communicator style" which encompasses individual dispositional differences and associated verbal and nonverbal communication patterns (e.g., an "attentiveness style," Norton & Pettigrew, 1979). Even Sandell conceptualized style as similar to the personality concept in that a particular style consists of a set of stylistic elements or a "composite of traits" (p. 15).

While an examination of clusters or dimensions of stylistic choices may well yield worthwhile insight, any effort at studying style should profit from the limitations of past efforts at studying style. Miller,

Burgoon and Burgoon (1984) note that, historically, the rhetorical scholarship on style has failed to contribute significantly to our understanding of persuasion. This lack of contribution is due to a "major preoccupation . . . [with] sorting and labeling various tropes and figures . . . [rather] than with positing functional relationships between variables" (p. 403). The net result has been the production of a "vast and ponderous" glossary of stylistic tactics rather than a theoretically meaningful and testable taxonomy (see Kaplan, 1964, p. 111-112, and Hempel, 1965. For a sample of the various tropes and figures see Corbitt, 1971, who is also critical of the excessiveness of the Tudor figurists). Given the lack of knowledge about stylistic factors or traits, "it is probably wise to suspend judgments about what factors of style there 'are', resting content with the indications of the abundance of variables amenable to quantification" (Sandell, 1977, p. 46).

While the Tudor rhetoricians were amiss, there have been some efforts to link stylistic variables to other communication relevant variables. Certainly, Gorgias (Plato, c. 387 B.C./ 1952), Longinus (c. 100/ 1965), the elocutionists, and Blair (1783/ 1965) have suggested that style adds ornateness or beauty to discourse which should enhance source credibility. Longinus (c. 100/ 1965) points out that stylistic excesses should decrease source credibility. Joseph (1947) attempted to classify the various figures of speech under the four categories of grammar, ethos, logos, and pathos. Perelman and Olbrechts-Tyteca (1969) claim that style can be "argumentative" in the sense that the form and the content of a "rhetorical figure" is used to advocate "a change in perspective" (p.

169). Wilson and Arnold (1978) argue that the primary function of style is to increase the clarity of expression as well as to foster attention, comprehension, and retention of the message (see also Thomas, 1956; Bowers & Osborn, 1966; Zillman, 1972; Zillman and Cantor, 1974). Burke (1969) and Sandell (1977) have proposed that style affects receivers' impression of homophily with the source. Each of these effects has received, at best, equivocal support (for reviews see Sandell, 1977; Bradac, Bowers, & Courtwright, 1979; Frandsen & Clement, 1984).

By far the most documented effect of style involves changes in attitude towards the issues in messages. The empirical research on the affective implications of style has examined a number of stylistic variables such as language intensity, opinionated language, obscene language (For reviews, see Burgoon & Miller, 1985, and Bradac, Bowers, & Courtwright, 1979), metaphors (Bowers & Osborn, 1966; Reinsch, 1971; 1974; Jordon, 1972; Siltanen, 1981), analogy (McCrosky & Combs, 1969), and rhetorical questions (Zillman, 1972; Zillman & Cantor, 1974; Petty, Cacioppo, & Heesacker, 1981). The effects found in these studies, however, have frequently emerged within interactions with source characteristics (Bostrom, Basehart, & Rossiter, 1973; Burgoon, Jones, & Stewart, 1975), and receiver characteristics (Burgoon et al., 1975; Burgoon & Chase, 1973; Basehart, 1971; Petty, Cacioppo, & Heesacker, 1981).

The complexity of these interactions on affect along with the uncertainty about the other potential effects of style have fostered skepticism and complaints about theory development on message style

(Sandell, 1977; Bradac et al, 1979; Frandsen & Clement, 1984; Miller, Burgoon, & Burgoon, 1984). Burgoon and his associates (see, in particular, Burgoon & Miller, 1985), however, are actively advancing a theory of linguistic expectancy violations which has demonstrated potency for accounting for the interaction effects of stylistic variations on attitudes.

The central proposition of the theory of linguistic expectancy violations is that when a source violates normative expectations about appropriate communication behavior, receivers' attitudes will be affected. If the violation exceeds what is expected, the attitudes will change in a positive direction. If the violation falls short of what is expected, the attitudes will either not change or change in a negative direction.

These interaction effects may also be, in part, a reflection of the degree of message elaboration engaged in by the message recipients. In some cases it may have been that stylistic tactics produced an affect towards the message thesis that resulted in a reduction of elaboration. In other cases the stylistic tactic may have contained information relevant to both affective reactions and elaborative efforts. For example, language intensity may both violate a receiver's notion of appropriate language on some statements while supplying information on the probable truth of other statements. (See the operationalization of language intensity by Miller, 1978.) Unfortunately, such a conclusion is at best speculative since elaboration was not a variable of concern in the studies.

A study that reveals the complexities of studying the relationship between style and elaboration is offered by Petty, Cacioppo and Heesacker (1981) who report three-way interactions between argument quality, style (the use of rhetorical questions) and predisposition to elaborate ("issue involvement" or propensity to be affected by the proposal) on attitude change and listed thoughts. Petty et al. interpreted their data as showing that rhetorical questions enhanced elaboration for those not predisposed to elaborate and distracted those who were predisposed to elaborate. A closer examination of their data on thoughts listed and a self perception measure of distraction, however, does not support the enhancement-distraction explanation. Recalling that argument quality was operationalized in terms of preexisting responses to the arguments, Petty et al.'s data actually indicate that for the no rhetorical question conditions, the subjects' elaboration (thoughts listed) was determined by the predisposition to elaborate and the preexisting responses to the arguments. In the rhetorical question conditions, the subjects predisposed to elaborate generated more counterarguments and fewer favorable arguments than other groups while those not disposed to elaborate generated thoughts consistent with the preexisting responses to the arguments. Apparently rhetorical questions enhanced elaboration regardless of predisposition to elaborate. It was the form of elaboration (consistent with preexisting responses vs. responses unique to the message) that was affected.

There were actually two groups that reported being distracted: 1) Those with low issue involvement (i.e., low predisposition to elaborate) that did not encounter rhetorical questions and, 2) those with high issue

involvement that did encounter rhetorical questions. In short, the self reports of distraction were apparently not related to the thoughts listed. (Perhaps the distraction score was more of an indication of actual elaboration or elaboration avoidance.)

Unfortunately, it is difficult to offer an alternative interpretation of the three-way interaction reported by Petty et al. in light of the operationalizations of argument quality, predisposition to elaborate, attitudes (Petty et al. averaged standardized scores from a traditional attitude measure with standardized scores from a single agree-disagree belief measure without reporting standard deviations or reliabilities) and the lack of information about the subjects' preexisting attitudes on the topic. Nevertheless, the interactions seem to be more a function of the conflicting tendencies to engage in elaborative thought than the effect of style as a persuasive cue. Indeed, the rhetorical questions invited thought (e.g., "Don't you agree that . . ." and "Isn't it true that . . " p. 436) as did the task given to the experimental subjects (to evaluate editorials for broadcast on the college radio station). In addition, the use of propensity to be affected (issue involvement) as an operationalization of predisposition to elaborate does not seem to capture the notion of habitual cognitive effort. At any rate, it is clear that enhancement or distraction from elaboration do not account for the results.

One study that tends to support the speculation about the relationship between style and elaboration is Basehart's (1971) investigation of opinionated language and receivers' need for approval. Basehart reports

an interaction between need for approval and opinionated language such that those with high need for approval were influenced by the opinionated statements of the advocate. (Low need for approval and high need for approval without opinionated language groups were not significantly influenced by the message.) The suspicion that the effect of opinionated language on high need for approval receivers is due in part to the receivers' failure to elaborate on the message is partially corroborated by Basehart's report that the high need for approval subjects comprehended the message less than did the low need for approval subjects. The expectancy violation effect on attitudes is concomitantly viable in the study since the high need for approval subjects may well have been pleasantly surprised with the directed information provided by the opinionated language.

These ideas on message style, attitudes, and elaboration offer insight and a caveat for the role of message style in social influence. The caveat is that stylistic tactics must be examined, in light of normative expectations, for the potential impact on affect as well as the potential impact on message elaboration. Given that this study has made an effort to avoid potential message variables which may directly affect to amount of elaboration it is necessary to offer only the prediction that stylistic tactics will influence receivers' attitude on the persuasive thesis.

The considerations of argument validity, evidence, and message style above suggest that the following propositions should be incorprated into the an extended model of belief elaboration and attitudes in persuasion:

Proposition 7: The greater the degree of elaboration on a message, the higher the evidence evaluation for a message.

Proposition 8: The higher the evidence evaluation for a message, the higher the message evaluation will be.

Proposition 9: The stronger the evidence in a message, the higher the message evaluation will be.

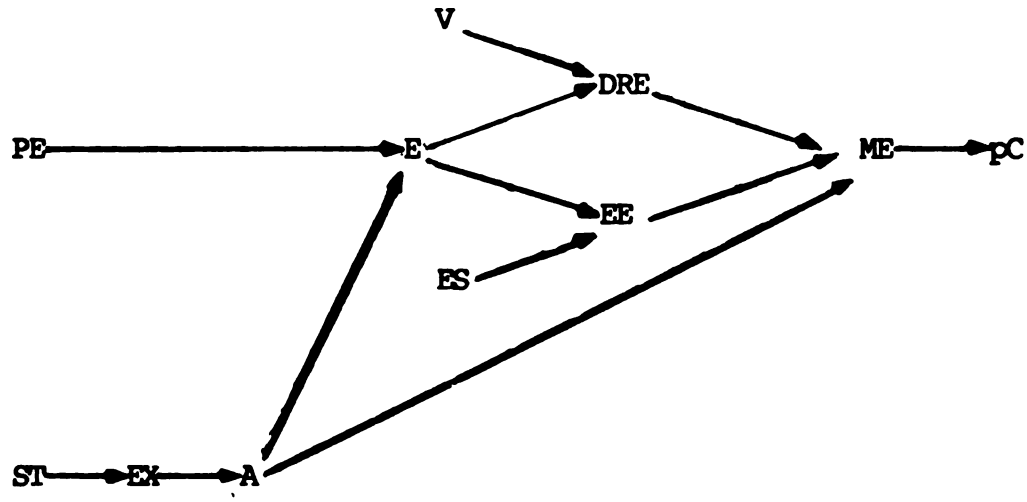
Proposition 10: The use of a stylistic tactic in a message will result in message receivers being more likely to rate the language in the message as unexpected.

Proposition 11: The higher the ratings that the language in a message is unexpected, the higher the attitudes toward the message will be. (Assuming a positive violation of expectations.)

Proposition 12: The use of valid (vs. invalid) arguments in a message will result in less likelihood of detecting reasoning errors in the message.

The extended model of belief elaboration and attitudes in persuasion is presented in Figure 3. The extended model incorporates the links between logical arguments and evidence in a persuasive message to the detection of reasoning errors and incorporates the links between message style, expectancy, and attitude towards the persuasive thesis.

Figure 3
An extended Model of Belief elaboration and attitudes
in Persuasion



Where:
pC = probability of belief in the conclusion of the message
ME = message evaluation
DRE = detection of reasoning errors
EE = evidence evaluation
V = validity of message arguments
ES = strength of the evidence in a message
E = elaboration
PE = predisposition to elaborate
A = attitude
EX = expectation
ST = message style

Methods

In order to explore and test the relationships proposed in the extended model of belief elaboration and attitudes in persuasion, measures or operationalizations for each of the variables were selected or developed and applied in an experimental setting in which subjects were asked to respond to a persuasive message. The persuasive message was on the topic of the legalization of heroin and the subjects were requested to respond to the message as if it were an editorial or magazine article. The experimental manipulations and measures necessary for testing the model were contained in a single questionnaire booklet. Following completion of the questionnaire booklet, the subjects were debriefed and thanked for their participation. Following a check upon the measurement model, path analytic procedures were applied to test the model.

Test of the model

The proposed model was tested with path analysis (see Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975, pp. 383-397, and Kenny, 1979, chapter 3). Specifically, the path analysis computer program for personal computers written by Hunter and Hamilton (1986) was employed to calculate path coefficients and the sum of squared errors (or estimated unspecified correlations based upon the path coefficients). A chi-square goodness of fit test was applied to test if the data differed significantly from what the model predicts.

Sample

Subjects were recruited from basic communication courses at a large Western state university with a multicultural student population. Since the probabilogical approach research has obtained correlations between beliefs in premises and beliefs in conclusions at .40 or better and given the uncertainty about the strength of the relationships proposed in the model under test, caution would dictate that a population r or .30 should be used in a power analysis (Cohen & Cohen, 1975. pp. 117-118) to determine an appropriate sample size. With alpha set at .05 and a desired power of .80 or better, the minimal sample size for the path analysis equations in this study is 216. The actual sample size was 240. The subjects participated in the study for extra credit in their courses.

Message construction

Selection. The health related persuasive message on the legalization of heroin constructed by Burgoon, Cohen, Montgomery and Miller (1978) was employed in the research effort. There were five reasons for selection of this message.

First, the message was selected because the topic is known to be associated with strong attitudes and was, therefore, regarded as a topic likely to be involving to the research participants. With such strong attitudes and potential involvement, the message was expected to maximize the potential for elaboration.

Second, the message was selected because the topic was one which was likely to be unfamiliar to most participants. McCroskey (1969) has demonstrated that prior knowledge on a topic reduces the effects of evidence. This reduction is, presumably, because the receivers rely on

their own knowledge rather than that provided in the message. A similar effect might be expected for the arguments in a message. Thus, the message selection aids in controlling for the influence of prior knowledge on the processing of the message arguments and evidence.

Third, the message constructed by Burgoon et al. (1978) has been shown to be persuasive (see also Miller, 1978). The necessity of demonstrated persuasiveness of the experimental message for this investigation is obvious.

Fourth, the message was selected because it allowed for manipulations of logic and evidence with a minimum of reconstruction. The Burgoon et al. (1978) message contains four arguments which are deductively valid. (Since the fourth argument was enthymematic, an additional premise was inserted to complete the logical structure. Since the second argument advanced a premise within the evidence for the premise, a formal statement of the premise was added.) In addition, each of the arguments in the message was supported with evidence.

Fifth, Burgoon (Burgoon et al., 1978; Burgoon & Miller, 1985) has argued that the lack of control of message variables in communication research has lead to conflicting and misleading findings. Thus the Burgoon et al. message was selected because it had been constructed to control for contingency (Becker, Bavelas, & Braden, 1961), subject-predicate compatibility (Clark & Begun, 1971), language intensity (Burgoon, 1970), sentence length, and total number of words. Given such controls in the initial construction of the message, the difficulty of reestablishing these controls after the manipulations of logic, evidence and message style were minimized.

Argument Validity. The four arguments in the original message are in the form of deductively valid universal affirmative (Barbara) syllogisms. The invalid versions of the arguments were created by rearranging the terms and the propositions such that no valid alternative conclusions could be reached by the premise combinations. The validity manipulations were independently verified by a logic and reasoning researcher. The universal affirmative form of the arguments was maintained. (See Table 2, Appendix D, for the argument validity manipulations).

Evidence. The evidence included in the original version of the message was not accompanied with source citation or source qualification statements. Since research on the use of evidence indicates that providing source citations and qualifications enhances the effects of evidence (Bostrom & Tucker, 1969), source citations and qualifications were added to the messages for the high quality evidence versions. For the poor quality evidence conditions the evidence was altered so as to violate two or more of the standard tests of evidence. In each instance, the source citations were deleted and the qualifications were altered so that the source of the evidence appeared to be marginally qualified on the issue to provide the evidence. In addition, each item of the evidence was altered so as to not directly support the premise being advanced. The specific evidence manipulations were:

Argument 1

Strong version of evidence: For example, in 1979, a team of medical researchers from the Federal Drug Enforcement Administration reported in the New England Journal of Medicine that over 900 addicts died in New York City from tetanus and hepatitis.

Weak version of evidence: For example, in 1969, a team of premedical students from Slippery Rock State College reported that a significant number of addicts died in New York City from secondary illnesses resulting from the use of the drug.

Argument 2

Strong version of evidence: According to the New York Times, research by Dr. Al Jordan, of the Harvard Medical School, shows that "when heroin users know the actual strength of the drug they're using, deaths and medical problems caused by overdosing are virtually eliminated."

Weak version of evidence: According to Al Jordan, secretary of the Seattle Drug Rehabilitation Council; "It seems that when heroin users know the actual strength of the drug they're using, deaths and medical problems caused by overdosing are reduced."

Argument 3

Strong version of evidence: Professor William D. Shintig of the UCLA Center for Drug Addiction Research recently wrote in the UCLA Law Review that "estimates by several independent researchers indicate that heroin addicts spend eighty-five percept or more of their income on the drug."

Weak version of evidence: Bill "Fetch" Shintig of the National Coalition for the legalization of Marijuana claims that "heroin addicts depend on others to supply them with food and clothes because they can barely find the resources to pay the high costs of the drug."

Argument 4

Strong version of evidence: Medical authorities from the World Health Organization now agree that heroin causes little physical damage. In addition, a team of researcher from Johns Hopkins University reported at a recent congressional hearing that the symptoms of heroin withdrawal are much less dangerous than those associated with the withdrawal from alcohol.

Weak version of evidence: It is now commonly agreed that heroin causes little physical damage. In addition, a health and nutrition researcher from the University of Arkansas claims that the symptoms of heroin withdrawal are about as bad as those associated with the withdrawal from extreme cases of alcoholism.

Message style. Many stylistic tactics may influence judgments of the probability of truth or alter the logical form of an argument. Further, they might invite elaboration on the arguments. Therefore, it was important that the stylistic variable employed be one that would not have these effects. Nevertheless, the stylistic variable selected should be positively associated with affective responses to the persuasive effort.

The first step in the selection of a stylistic variable was to eliminate all figures of speech that directly deal with the general themes or content of a message. This step resulted in the elimination of most of the tropes (changes in the meaning of words or phrases) and all of the figures of thought and amplification.

The second step was the elimination of all schemes (changes in the pattern or arrangement of sounds or words) that involve hyperbaton (unusual or inverted word order) or changes in the spelling or sounds of words. These schemes were eliminated in order to avoid complicating the reception of the message.

The third step was to eliminate all schemes that involve repetition of words or phrases. These schemes were eliminated on the grounds that such repetitions might enhance learning and recall of the arguments and thereby confuse affective responses with elaboration and elaboration with message learning.

The remaining list of stylistic variables consisted of a few tropes (mostly word substitutions) and schemes of sound repetition. From this list, alliteration (repetition of initial or medial sounds) was selected as the one stylistic tactic most amenable to manipulation and most likely to be sufficiently conspicuous to influence response to a message. Only one tactic was selected in order to maximize the probability of isolating the effect of message style. The specific stylistic manipulations were:

Paragraph one,	Style:	. . . the health and hopefulness of humanity.
	No style:	. . . the health and welfare of its citizens.
Paragraph two	Style:	. . . many addicts face dramatically dreary deaths from diseases.

Paragraph two,	No style:	. . . many heroin addicts are dying needlessly from diseases.
Paragraph three,	Style:	A second health hazard issue that we cannot ignore is that illicit heroin is impure and, thus, intrinsically injurious.
	No style:	A second health hazard faced by the user is the purchase of impure heroin.
Paragraph four,	Style	Since the cost of illegal heroin is so excessive, users are often unable to afford expenditures essential for escaping poor health.
	No style	Since the cost of illegal heroin is so excessive, users are often unable to afford items essential for maintaining good health.
Paragraph five,	Style	A fourth dimension that must be discussed is whether heroin is actually a dangerous or damaging drug.
	No style	A fourth issue that must be considered is whether the use of heroin constitutes a real health problem.
Paragraph six,	Style	. . . removing secondary infection reducing the risk of overdoses, raising the availability of nutrition and medication, and recognizing . . .
	No style	. . . eliminating secondary infection, reducing the number of overdoses, and increasing the availability of nutrition and medication, coupled with . . .

Following the insertion of the logic, evidence and style manipulations the experimental messages were compared on productivity (total number of words. The messages were constructed so that each contained exactly 29 sentences.), average sentence length, lexical diversity (type-token ratio), redundancy, pausality, emotiveness, complexity, readability (Flesch score), and contingency. (For a review on all of these measures,

except for contingency, see Lynch, 1970. The measure of contingency, which indicates the reconstructability or predictability of a message, was developed by Becker, Bavelas, and Braden, 1961). Since these measures are sensitive to differences in the encoding and decoding of messages and are generally representative of the various dimensions of message composition (see Lynch, 1970), consistency of values across the messages should assure a similarity in composition and reception. Such controls were employed to aid in isolating the effects of the specific manipulations in the study.

The initial evidence manipulation resulted in a noticeable difference in contingency scores between the weak and the strong evidence versions of the message. This difference appeared to have been the result of the deletion of the source citations. (The contingency index is a complex ratio of total nouns, total words, and repeated nouns weighted by appearance in the same or successive sentences.) In order to correct for this difference the weak versions of the evidence manipulations were reconstructed to include more nouns. Following the reconstruction the stylistic measures were recomputed.

The scores on each of the stylistic measures are presented in Table 1. The scores across the messages do not differ substantially.

It is worth note that while the contingency index for each of the messages is fairly high, the readability index is low. Since both of these indices are supposed to be positively related to comprehension the differences appear to present a conflict. After reexamining the indices however, it may be argued that the differences are offsetting rather than

Table 1
Comparison of stylistic indices for the research messages

Logic Evidence Style	Valid Strong Yes	Valid Strong No	Valid Weak Yes	Valid Weak No	Invalid Strong Yes	Invalid Strong No	Invalid Weak Yes	Invalid Weak No
Total words	720	716	716	712	725	721	721	717
Average sentence length	24.80	24.70	24.70	24.60	25.00	24.90	24.90	24.70
Lexical Diversity	.44	.45	.43	.43	.43	.43	.42	.43
Redundancy	1.30	1.40	1.40	1.50	1.60	1.70	1.80	1.80
Pausality	2.40	2.30	2.30	2.20	2.40	2.40	2.40	2.30
Emotiveness	.30	.29	.29	.28	.28	.27	.27	.26
Complexity	1.71	1.70	1.68	1.67	1.68	1.68	1.66	1.65
Readability	36.99	37.95	39.64	40.58	39.33	39.44	41.13	42.17
Contingency	.79	.77	.82	.80	.76	.75	.78	.77

upsetting. That is, while the readability scores indicate that the messages are fairly difficult to comprehend (the scores indicate college level writing) because of the multisylabic words and long sentences, the contingency scores indicate that the long words and sentences are offset by the predictable patterns of nouns. Thus, it is reasonable to conclude that the messages were moderately difficult to comprehend. Becker et al. (1961) suggest that moderate comprehension difficulty is optimal for communication effectiveness since low or high levels of difficulty might frustrate the message recipient.

Measurement

Predisposition to elaborate. There are several measures which might tap the predisposition to elaborate (e.g., measures of discriminative ability, ability to organize ideas, reasoning skills, scholarly aptitude). For the sake of consistency, and potential comparisons, however, the need for cognition instrument employed by the Petty and Cacioppo research teams was selected as an indicant of the predisposition to elaborate.

Since Cohen's (Cohen et al, 1955; Cohen, 1957) original measure of need for cognition is apparently no longer available, Cacioppo and Petty (1982; Cacioppo, Petty, & Kao, 1984) developed new long and short version measures of need for cognition. The long version measure has 34 Likert-type scales headed by statements descriptive of habitual cognitive effort (e.g., "I would prefer complex to simple problems" and "thinking is not my idea of fun"). A principal-components factor analysis of the scales revealed one primary factor which had an eigenvalue of 10.22 and

accounted for 30.2% of the variance in responses. The reliability coefficients (Theta, which is a corrected Cronbach's Alpha) for the measure across four studies, with samples from a variety of populations, averaged to .90. The discriminant validity for the instrument was demonstrated for college professors vs. assembly line workers and enjoyment of tasks with simple vs. complex rules. The measure is not correlated with trait anxiety or social desirability but is correlated with measures of field independence, dogmatism (negatively), and subjects' recall of their college entrance aptitude exam scores.

The short version of the need for cognition scale (Cacioppo et al, 1984) consists of 18 of the highest loading scale items from the long version. The reliability (Theta) of the short version for a sample of college students was .91. The correlation between the long version and the short version is quite high ($r = .95$). The short version of the need for cognition measure was used in this study as an estimate of the predisposition to elaborate (see Appendix C).

Elaboration: Cognitive effort. Cacioppo, Petty and Morris (1983) reported the measurement of cognitive effort in message processing with two 9 point scales one of which was specific to the experimental task ("To what extent were you working hard to evaluate the student's performance as a journalist?" and "How much effort did you put into evaluating the communication?"). The reliability of the measure was not reported. In order to improve upon the Cacioppo et al. (1983) measure of cognitive effort in message processing, measurement items were constructed by consulting a thesaurus to generate a list of eighteen phrases descriptive

of cognitive efforts or a lack thereof. Six of the descriptive phrases were deleted due to redundancy, excessive ambiguity, or words which might be unfamiliar to the research participants. The remaining twelve phrases consisted of six phrases descriptive of cognitive effort and six phrases descriptive of a lack of cognitive effort. The phrases that were selected are: Attempting to analyze the issues in the message; Not very attentive to the ideas; Deep in thought about the message; Unconcerned with the ideas; Extending a good deal of cognitive effort; Distracted by other thoughts not related to the message; Not really exerting your mind; Doing your best to think about what was written; Reflecting on the implications of the arguments; Resting your mind; Searching your mind in response to the ideas; Taking it easy. Seven point agree-disagree Likert-type scales were placed after each of the phrases. The twelve phrases were randomly selected for order of placement in the research questionnaire. The instrument was completed with a heading which reads: "While reading the message were you:" (see Appendix C).

Probability of belief in a proposition. McGuire (e.g., 1960a) and Wyer (e.g., 1975) have typically measured the probability of belief in a proposition by presenting subjects with an eleven interval scale bounded by expressions such as true-false, very probable-very improbable, or not at all likely-extemely likely. Wyer (e.g., 1975) bases the assumption that the probability of belief scale is sound and "approximately interval with an origin at zero" on "the quantitative accuracy of [the probabilogical] equation . . . in previous studies" (p. 312). Nevertheless, the reliability and validity of the measurement technique are not typically discussed or reported in the literature.

Fishbein (Fishbein & Raven, 1962; Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) has developed a set of semantic differential-type scales to measure belief (defined as "the probability dimension of a concept," Fishbein & Raven, 1962, p. 35) that have been demonstrated to be reliable (above .85) and valid (See Fishbein & Ajzen, 1975, p. 108, and Reynolds, 1978). In order to capitalize on the reliability and to maintain consistency in the questionnaire structure, the Fishbein belief scales were employed. The measure consists of four scales bounded by the bipolar adjectives true-false, probable-improbable, likely-unlikely, correct-incorrect (see Appendix C).

Detection of reasoning errors (DRE). Unlike the host of reasoning studies (see Reynolds & Burgoon, 1983) it is untenable in this investigation to present subjects with the arguments being studied in an objective test format. Such an effort might prompt the subjects to detect errors that were not detected while processing the persuasive message. The work conducted in testing the probabilogical equations, however, suggest a viable approach to the measurement of reasoning error detection.

If the first term of the probabilogical equations is an adequate measure of the rationality of an argument held by a person, which it appears to be, then the measurement of the constituent parts of the equation can be altered in order to assess recipients' perceptions of the rationality of an argument presented in a message. That is, the multiplication of the estimates of the source's belief in the propositions of an invalid message argument (p_sAp_sB) should not equal the estimate for the source's belief in the conclusion (p_sC). Thus, it follows

theoretically that the sum of the absolute values of the differences between (p_sAp_sB) and (p_sC) should be an index of the detection of reasoning errors. Thus:

$$DRE = \Sigma |(p_sAp_sB) - (p_sC)| \quad \text{Equation 5}$$

The probability of belief scales were used to measure the relevant components of the index of reasoning errors for each message (see Appendix C for the measurement and Table 2, Appendix D, for the specific argument premises).

Evidence evaluation. The measurement of evidence evaluation was accomplished by means of a twelve item instrument with seven point Likert-type scales with stimulus statements derived from discussions of the traditional tests of evidence (e.g., Miller, 1966; McCroskey & Wheeless, 1976). The instrument was headed by the phrase "The evidence presented in the message was:" The evidence evaluation measurement items were: Inconsistent with the arguments being advanced; Current to the issue today; Sufficient to prove the points being supported; Not typical of what is known about this problem; Irrelevant to the conclusions drawn in the message; Not clear and understandable; Documented well enough so that any reader could look it up; Contained clear and understandable statistical information; Taken as a whole, supported the point being made; Came from experts on the topic; Came from persons who were biased on the topic; Came from credible magazines or books. Five of the twelve items were worded negatively in order to reflect the poles of the measurement scales (see Appendix C).

Message evaluation. The absence of a test of Petty and Cacioppo's (1981; Cacioppo, Petty, & Morris, 1983) contention that persuasion is mediated by the recipients' message evaluations is in part due to their lack of a measure of message evaluation which is informed by an expertise in communication. Cacioppo et al. (1983) report the use of a "message effectiveness" measure which is composed of 5 nine-interval scales on which the respondents are asked to report how "effective," "convincing," "compelling," "well written," and "liked" the message (or the reasoning) is. The reliability of the instrument was not reported. Clearly, the conceptual differences between these measurement items indicates that the measure is problematic.

Message evaluation or message effectiveness is frequently mentioned in the communication literature but seldom measured. Among the attempts to measure message evaluation, most tend to focus more on source perceptions (e.g., Street & Brady, 1982; Johnson & Buttny, 1982) or on delivery skills (e.g., Clevenger, 1964; Barker, Kibler, & Geter, 1968; Freimuth, 1976). Burgoon (1975) employed scales to measure perceptions of how well the message was supported and message clarity. Bradac, Desmond and Murdock (1977) employed message evaluation scales that asked for perceptions of message organization, difficulty, general effectiveness as well as attitude toward the topic. While these efforts share a common concern for message evaluation, the foci seem to be quite divergent.

One effort specific to investigating message evaluation has been offered by Burgoon (1972). Burgoon constructed message evaluation scales which were representative of the evaluative dimension reported by Osgood,

Suci and Tannenbaum (1957). Subjects' responses to the scales after receiving one of several messages advocating social change were factor analyzed. The results revealed two factors: Message evaluation and message interest. (A third factor also emerged which was specific to militancy which Burgoon had intentionally manipulated in the study.) Since the degree to which a message is interesting was not an immediate concern in this investigation, the interest factor was not measured. The message evaluation scales developed by Burgoon (1972) are seven interval semantic differential type scales with the bipolar adjectives: Accurate-inaccurate; good-bad; believable-unbelievable; wise-foolish; responsible-irresponsible; acceptable-unacceptable. In order to facilitate comparison with other studies that have used measures of message evaluation (particularly Cacioppo, Petty and Morris, 1983), the following bipolar adjectives representative of these measures were added to the instrument: Powerful-weak; mild-strong; convincing-unconvincing; effective-ineffective; well written-poorly written; compelling-uncompelling; organized-disorganized; clear-unclear; supported-unsupported; logical-illogical; rational-irrational; sound-unsound; valid-invalid; well reasoned-poorly reasoned.

Attitude toward thesis. McGuire (e.g., 1960a) measured pD (the desirability of the argument conclusion) by asking subjects to respond to each proposition on a five-interval scale bounded by the expressions; very desirable-very undesirable. Since it is being argued the pD is conceptually and operationally similar to standard measures of attitudes and since a standard measure of attitude is more likely to be valid,

reliable and, thus, offer a greater opportunity for comparison to other persuasion studies than a single desirability scale, a standard measure of attitude was employed. The measure consists of six semantic differential-type scales bounded by the bipolar adjectives good-bad, foolish-wise, desirable-undesirable, harmful-beneficial, pleasant-unpleasant, and worthless-valuable. Miller (1978) employed a similar set of scales for responses to messages similar to those in this study and reports a reliability coefficient of .93.

Expectancy. In order to measure the subjects' expectancy reactions to the messages, four of the five semantic differential-type scales employed by Miller (1978) were adopted. (The fifth scale, likely-unlikely, was deleted to avoid repetition with the belief measure.) The scales are bounded by the bipolar adjectives predictable-unpredictable, expected-unexpected, surprising-not surprising, anticipated-unanticipated. Miller (1978) reports a reliability coefficient of .76 for the expectancy scales.

Procedures

Subject recruitment for participation in the study was accomplished by a single page handout that explained the need for participants in the study, described the study as requiring the reading of a message and responding to a questionnaire, mentioned the possibility of extra credit, and listed the available times for participation. The subjects signed up for participation on the same sheet and were provided with a reminder slip on which they were instructed to mark down the time and place that they had signed up for. The recruitment sheets were handed out and collected during regular class hours by the instructors or the researcher. In addition, a sign up sheet was posted on a bulletin board in a hallway

where students could continue to sign up after the initial recruitment process and instructors were asked to frequently remind students of the research opportunity. The research periods were scheduled over a two week time period in late November. From 12 to 35 subjects participated in each of the research sessions. The research booklets were randomly distributed to the subjects after they were seated in the research room.

The first page of the research booklet provided an introduction to the study and instructions on participating in the study. The introduction to the study explained that the subjects were participating in a test of several different messages which were being considered for subsequent research and that it was, therefore, important that they read the message as if they were reading it in a magazine or the opinion section of a newspaper. The instructions directed the subjects to follow uniform procedures while participating in the study. The subjects then read the version of the message contained in the questionnaire booklet. After reading the message, the subjects completed the questionnaire which contained measures for belief in the thesis of the message, attitude towards the thesis in the message, message evaluation, language expectancy violations, assessments of the source's belief in each of the argument propositions, evidence evaluation, message elaboration, and need for cognition (See Appendix C).

Following completion of the measurement instruments, the subjects were handed a debriefing questionnaire on their knowledge of the research purpose. None of the subjects had an accurate interpretation of the research purpose. Following the debriefing questionnaire, the subjects were debriefed on the study and thanked for their participation.

RESULTS

Measurement model checks

Prior to the test of the proposed model an examination of the measurement model was conducted. The reliabilities (Cronbach's alpha) for each of the measured variables were: Need for cognition, .86; elaboration, .84; expectancy, .85; attitude, .93; evidence evaluation, .82; detection of reasoning error (DRE), .23; message evaluation, .94; belief, .89. With the exception of the measurement of DRE, the measurement reliabilities were quite high.

The low reliability for the measurement of DRE was probed first by examination of the individual reliabilities for the measurements of the source's belief in the premises and conclusions of the arguments. The average reliability coefficient for the eight premise and four conclusion measures was .97 with a range between .94 and .98. It is worth note that the reliability analyses of these measures indicated low scale variances.

The second probe of DRE measurement involved a comparison of DRE scores (as computed by equation 5) for each of the four arguments in the message. The results of the probe of each of the arguments (see Table 2 and Table 3, Appendix D) indicated that the first three argument validity manipulations produced significant differences in the DRE scores. For each of the first three arguments, the average DRE score for the invalid arguments was nearly twice the score of the average DRE score for the

valid arguments. Consistent with the average DRE scores, the subjects' probability estimates of the source's belief in the conclusions of each of the first three arguments were higher for the valid arguments (X = .71) than for the invalid argument (X = .55). For the fourth argument, the subjects estimated the source's belief in the conclusion to be higher than logic would permit for both the invalid and the valid versions of the argument and, also, did not differ on the DRE scores. It appears, therefore, with the exception of the fourth argument, that the manipulation of argument validity was successful and that the DRE equation (5) was sensitive to the manipulation.

The third probe of the DRE scores involved the examination of scattergrams of the DRE scores between each of the first three arguments in the message for the valid and invalid conditions. The scattergrams provided two insights into the low reliability of the DRE measure. First, approximately one-half of the subjects consistently had low DRE scores across the arguments. (A low DRE score would indicate that the source's belief in the conclusion was logically consistent with the source's beliefs in the argument premises.) As expected, fewer subjects in the invalid argument (47%) than valid argument (69%) conditions had consistently low DRE scores across the arguments. Second, on each scattergram, approximately one-third of the subjects had high DRE scores on one argument with low DRE scores on the other argument. This pattern was much more pronounced in the invalid (41%) argument conditions than in the valid (28%) argument conditions. Therefore, it appears that the low reliability for the DRE measure is primarily the result of inconsistent

assessments of the arguments and partially the result of insufficient variation produced by the validity manipulations. It must be stressed, however, that the patterns of DRE scores are far from random and that the validity manipulation did produce significant differences in the DRE score.

An examination of the strength of evidence manipulation (strong vs. weak) via one-way ANOVA revealed a significant affect on evidence evaluation ($F = 6.473$, $df = 1/239$, $p = .0116$, $omega^2 = .03$). The size of the effect, however, is somewhat disappointing.

An examination of the stylistic manipulation (alliteration vs. no alliteration) via one-way ANOVA revealed a nonsignificant affect on language expectancy ($F = 0.361$, $df = 1/239$, NSD). This lack of success with the style manipulation cast doubt upon the ability to test the style route of the proposed model with the current data.

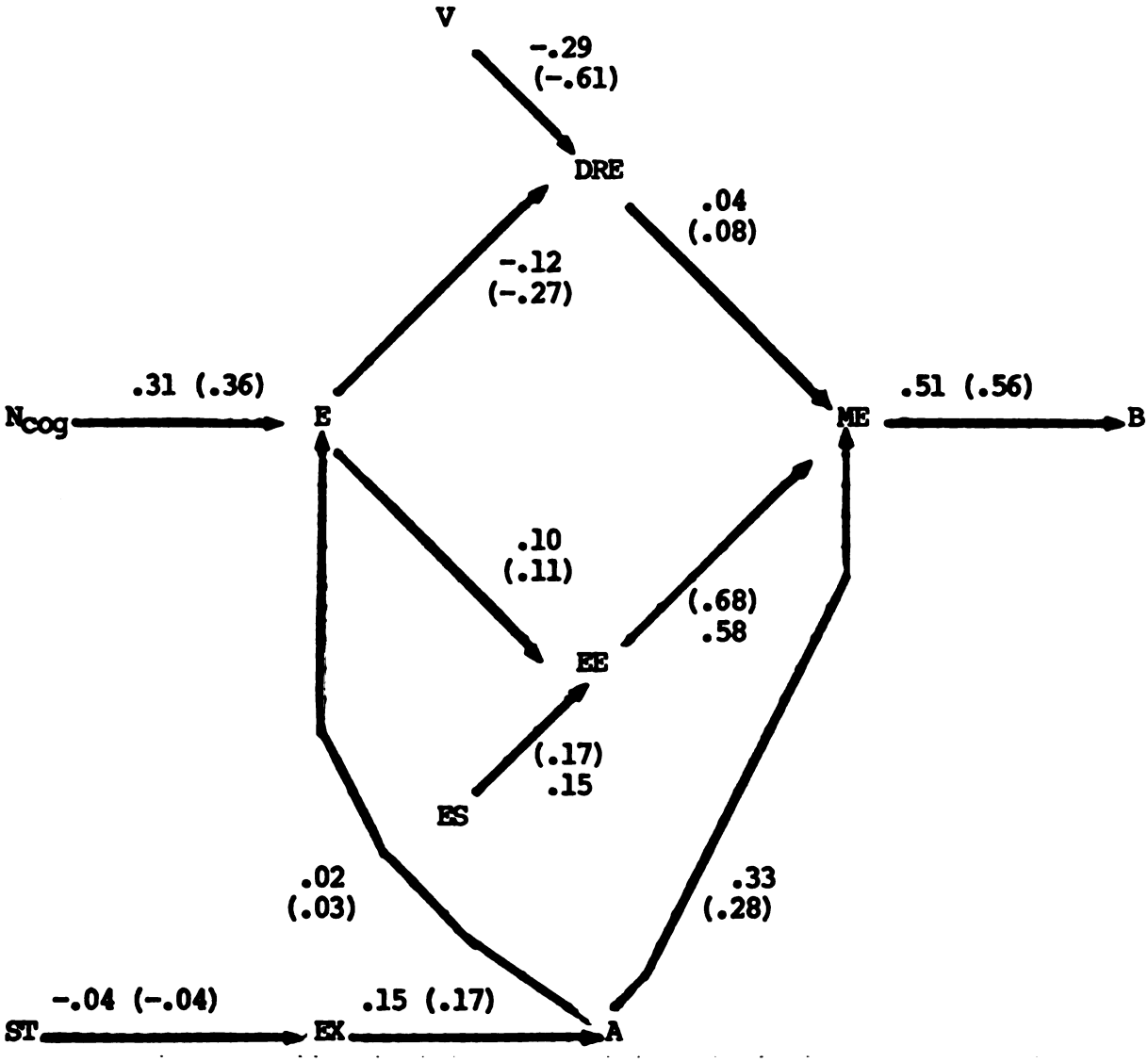
Given the controversy in the literature over the relationship between beliefs and attitudes, the belief and attitude scales were factor analyzed in order to examine the factorial structure of the scales. Fishbein and Raven (1962) conducted a factor analytic study on a similar set of scales for concepts on which there is some controversy about the actual existence of the phenomena (e.g., extrasensory perception) and found two clear orthogonal factors; one for belief and the other for attitude. In this study the belief and attitude concept of interest (the legalization of heroin) is more of a policy question than an existence question and, thus, provides grounds for a reassessment of the factor structure for the belief and attitude scales.

A principal components factor analysis with varimax rotation revealed that the belief and attitude scales of the legalization of heroin topic formed a unidimensional structure (see Table 4, Appendix D). A reexamination of the factor structure with an oblique rotation, however, revealed a two factor structure. Three observations are evident concerning the belief factor that emerged in the analysis with the oblique rotation. First, the eigenvalue for the belief factor is just below 1.0. Some researchers would consider such an eigenvalue grounds for rejecting the factor. Second, the correlation between the belief factor and the attitude factor is .73 which, of course, indicates that the factors are far from the orthogonal factors reported by Fishbein and Raven (1962). It should be noted, however, that the pattern of factor loadings evince some confidence in a two dimensional structure. Third, the factor loadings for the correct-incorrect and true-false belief scales are split between the belief and attitude factors and, thus, may not conceptually match "the probability dimension of a concept" (Fishbein & Raven, 1962, p. 35) definition of belief. On the basis of the factor analysis of the belief and attitude scales, it was concluded that a comparison of beliefs and attitudes separated and combined would be justified.

Test of the model

The path coefficients, sum of squared errors and chi-square test for the full model are presented in Figure 4. As would be expected given the measurement problems discussed above, the chi-square test indicates that the pattern of correlations are different from those predicted by the model. In short, the full model was not supported by the data. An

Figure 4
Results of the test of the
proposed model*



Sum of squared errors = .819

χ^2 = 198.9, df = 45, p< .01. Indicates that the model does not fit the data

Where:	A = attitude	EX	= expectation
	B = belief	ME	= message evaluation
	DRE = Detection of reasoning error	N_{cog}	= Need for cognition
	E = elaboration	ST	= message style
	EE = evidence evaluation	V	= Validity
	ES = evidence strength		

*Coefficients corrected for attenuation appear in parentheses.

examination of the error matrix for this analysis revealed that a large portion (61%) of the error was due to the path specifications for attitude. In particular, much of this error stems from the attitude-belief relationship. There are numerous possible explanations for this error (such as the lack of strength for the style manipulation or the unidimensional structure of belief and attitude scales) but, ultimately, this finding evinces the conclusion that style-expectancy-attitude route in the proposed model must be deleted prior to further exploration of the model.

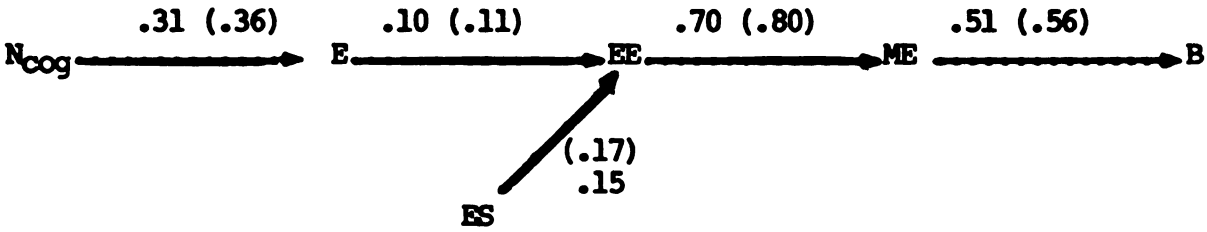
An examination of the path coefficients in Figure 4 shows that the paths between the strength of evidence manipulation and evidence evaluation (.15), message elaboration and DRE (-.12), and between message elaboration and evidence evaluation (.10) were significant but not particularly strong. The path between DRE and message evaluation (.04) was not significant. Correction for attenuation due to measurement error improves the path coefficients for the message elaboration-DRE and DRE-message evaluation paths but does not improve the path coefficients for the message elaboration-evidence evaluation or for the strength of evidence manipulation-evidence evaluation paths. The improvements are largely due to the low reliability for the measurement of DRE (note that the path from the manipulation of argument validity to DRE jumps from -.29 to -.61 when the correlations are corrected for attenuation).

An examination of the directions of the path coefficients revealed that the message elaboration-DRE and the DRE-message evaluation paths were in directions opposite of that predicted. Given the low reliability of

DRE and the small magnitude of these two path coefficients, interpretation of these two reverse directional coefficients in certainly problematic and may, perhaps, be meaningless. All of the other paths were in the direction predicted.

The most obvious explanation for the negative path coefficient between message elaboration and DRE is that there may be an interaction between argument validity and message elaboration on DRE such that for invalid arguments as message elaboration increases, DRE increases while for valid arguments, as message elaboration increases, DRE decreases. This potential interaction effect was tested by means of a 2 X 4 validity by message elaboration (quartile split) ANOVA for DRE. The main effect for validity on DRE was significant (F = 22.86, df = 1/232, p = .001, omega^2 = .095). The main effect for message elaboration on DRE (F = 1.38, df = 3/232, NSD) and the interaction effect for validity and message elaboration on DRE (F = 1.76, df = 3/232, NSD) were not significant. The pattern of means, however, indicates that for valid arguments, DRE slight decreases as elaboration increases while for invalid arguments, the message elaboration-DRE relationship forms an S shaped curve where DRE decreases, increases and then decreases again as elaboration increases. Perhaps with a more potent argument validity manipulation, greater power and a more reliable DRE index, the interaction may have been significant. For this data set, unfortunately, the message elaboration-DRE path appears to be uninterpretable. Similarly, the nonsignificant path between DRE and message evaluation is also uninterpretable.

Figure 5
Results of the test of the
evidence route*



Sum of squared errors = .041

$\chi^2 = 7.73$, df = 10, $p < .01$. Indicates that the data do not differ from the model's predictions.

Where: B = belief
E = elaboration
EE = evidence evaluation
ES = evidence strength
ME = message evaluation
N_{cog} = Need for cognition

*When belief and attitude are combined, the coefficient between ME and Belief/Attitude is .57 (.61). All other coefficients remain approximately the same and the combination does not substantially improve the fit between the model and the data.

Coefficients corrected for attenuation appear in parentheses.

Supplementary analyses of the model

Evidence route isolated. Due to the caution dictated by the error resulting from low reliability of the measurement of detection of reasoning error and the counter-to-expected message elaboration-DRE and DRE-message evaluation paths, the evidence route of the model was examined in isolation. The path coefficients, sum of squared errors, and chi-square test for the route are presented in Figure 5. With the exception of the path from message elaboration to evidence evaluation, the paths along the route are all fairly strong. The chi-square tests (for raw and corrected correlation matrices) indicate that the data do not differ from those the model would predict for the route. Indeed, the sum of squared errors of .041 (.063 following correction for attenuation) is impressively low.

DISCUSSION

The strongest and most significant finding from this study is that the effect of evidence evaluation in persuasion is mediated by the receivers' evaluation of the message. This finding, if supported by subsequent testing, may well provide insight into a host of null effect and small effect evidence studies (see Reynolds & Burgoon, 1983). In addition, there is some indication that receivers' evidence evaluations are a function of habitual cognitive efforts as well as actual cognitive elaboration on the message.

Limited support was garnered from this study for the conclusion that the validity of the arguments in a message are detectable by receivers' assessments of the source's belief in the argument premises and

conclusions. The predictions that message elaboration results in the increased detections of reasoning errors and that the detection of reasoning errors will reduce message evaluation were not supported.

The results of this study are uninformative about the role of message style (as it was conceptualized) in persuasion. There was no support from this study for the idea that message style which positively violates expectations will foster more favorable attitudes toward the message thesis. There was also no support for the notion that a message style induced attitude towards a message thesis will affect the elaboration on the message or the evaluation of the message.

Taken together, these findings support two major tenets of the cognitive response approach to persuasion (e.g., Greenwald, 1968; Petty, Ostrom, & Brock, 1981; Petty & Cacioppo, 1981). First, the impact of message variables on persuasion is mediated by the receivers' evaluation of the persuasive message. Second, receivers' message evaluations are affected by their cognitive habits and their cognitive elaboration of the message content. The support for these two tenets must, however, be qualified by the strong critical commentary and suggestions for necessary revisions in the elaboration likelihood model of cognitive responses provided earlier (see also Stiff, 1986). Perhaps more important, the conclusion concerning the role of message evaluations in persuasion was reached here without the pitfalls of the thought-listing technique (see Miller & Baron, 1973, and Greenwald, 1981).

The most glaring difficulty with this study is the failure to satisfactorily manipulate message style. Apparently, the alliteration

effects attributed to famous speeches (e.g., King's "I have a dream" speech) are either much more obviously a part of the message; dependent on other message, presentational or source variables; or simply better examples of alliteration than those employed in this study. Then again, the effects of alliteration in famous speeches may simply have been over estimated by rhetorical critics. The question remains an empirical issue.

A second difficulty with this study occurred with the relationship between attitudes and beliefs. Previous research led to the speculation that message variables might affect a receiver's attitude towards the message thesis which would, in turn, affect the processing of the message. Of course, such a statement would suggest a longitudinal study with the capacity to measure attitudes derived from the message as separate from the receivers' initial attitudes or their post-message attitudes on the message thesis. Perhaps a better estimate of the expected effect for attitudes would have been obtained if the stylistic manipulation had been successful and premessage attitudes were measured and partialled out of the derived attitudes. On the other hand, the evidence provided by this study tends to support the conclusion that attitudes and beliefs are probably not conceptually distinct or, at a minimum, belief is not yet accurately operationalized. It may also be that the relationship between attitudes and beliefs varies with the cognitive concept under consideration. Since Fishbein and Raven (1962) report an orthogonal relationship between belief and attitude for questions of existence (or fact) while factor analysis reported herein indicates a unidemensional (or, at best an oblique) relationship for

questions of policy (should heroin be legalized), than perhaps there is a variation in the relationship between beliefs and attitudes between concepts that would be classified as questions of fact, policy or value.

A third difficulty with this study concerns the measurement of DRE. While the adaptation of the McGuire (1960a) probabilogical formula (compare equations 1 and 5) to assess recipients' perceptions of the rationality of an argument presented in a message did discriminate between valid and invalid argument manipulations in this study, the values for each argument apparently do not sum together efficiently into a single DRE score. This difficulty with the measurement of DRE seems to be largely the result of inconsistent assessments of the arguments in the messages. This inconsistency may be the consequence of a general inability to assess multiple arguments. Ray, Carranza and Reynolds (1986) note a similar lack of consistent argument decoding with disjunctive permitted choice utterances and attribute the effect to contextual differences in the arguments. Since the arguments in this study are contextually similar, however, the lack of consistent argument decoding in both studies may perhaps be a function of some other information processing pattern. Two alternative explanations for the argument decoding inconsistencies are: (1) An equity principle; where, after message respondents unfavorably assess the validity of one argument, there is a compulsion to liberally assess the subsequent argument or; (2) a response bias where test-wise student participants are unlikely to accept all of the arguments in a message as being valid or invalid (i.e., all "true" or all "false"). Since the previous research with the probabilogical equations (e.g.,

McGuire, 1960a; Wyer & Goldberg, 1970; Hample, 1979b) has focused upon only one argument at a time, that literature offers little insight into this problem. To complicate matters further, given the positive, yet small correlation between the DRE score and message evaluation and the negative correlation between message elaboration and DRE, there is some doubt that the DRE score actually represents message recipients' perceptions that the arguments are valid or invalid. Obviously, a great deal of work remains to be done on the establishment of a DRE measure that is both reliable and valid.

The unpredicted negative direction of the message elaboration-DRE path remains perplexing. While the potential for an argument validity by message elaboration interaction on DRE remains plausible, there are many other rival explanations for this relationship. For example, it may be that those who elaborate more on messages are more likely to "correct" errors in others' reasoning. Perhaps, also, those who elaborate more are distracted by their focus upon the entire message and, thus, are less likely to detect reasoning errors. Even more plausible, those who elaborate are more likely to recall the occurrence of statements in a message and, therefore, are more likely to overestimate the source's belief in the statements which would result in an artificially low DRE score. (The higher the estimates for all three propositions in an argument, the lower the DRE score.)

The low positive path coefficient between DRE and message evaluation remains somewhat disturbing. While the low reliability for the DRE measure might mitigate any concern here until a better DRE measure is

arrived at, the strength of the path from the validity manipulation to DRE and the positive coefficient for DRE to message evaluation (the relationship was expected to be negative) suggests that more is amiss with the DRE-message evaluation path than just the low reliability of DRE. A scattergram analysis of DRE with message evaluation revealed an apparent curvilinear relationship such that when DRE was either low or extremely high, message evaluation was low. At moderately high levels of DRE, message evaluation was high. If this curvilinear relationship actually exists, then it would indicate that a number of the message receivers assessed the argument premises and conclusions in a manner consistent with logical validity, but still evaluated the message negatively.

Modifications and suggestions for future research

The most evident modification necessary before this program of research can proceed is to establish a reliable and valid measure of the detection of reasoning errors in messages. This improvement may be accomplished with a simple modification of the DRE formula that takes into account the equity principle or response bias that appears to be operating in the assessments of multiple arguments. Further consideration and refinement of Wyer's (e.g., Wyer & Hartwick, 1980) and Hample's (1978) work with the pK component of the McGuire formula might help with the measurement of the detection of reasoning errors. It may also be that a simple direct measure of message recipient's perceptions of the logical validity of message arguments could be developed.

The second modification needed for this research program to continue is the need to replicate this study with an improved manipulation of

message style. As discussed under the selection of the manipulation employed in this investigation, the issue of the relevance of stylistic variables to message content processing vs. "peripheral route" (Petty and Cacioppo, 1981) processing remains to be explored in depth.

The need to clarify the relationship between belief and attitude in message processing is certainly a subject for further research that this study points to. Related to the belief and attitude issue is the need for refinement in the measurement of beliefs. Clearly, much of the probabilogical, reasoned action, and elaboration likelihood literature turns on the belief and attitude relationship. If the relationship between belief and attitude varies with the type of proposition being assessed, that finding will have wide consequences for a large body of persuasion theory. An investigation of how the relationship between beliefs and attitudes might vary with the cognitive concepts under consideration is currently being conducted by this author.

Stiff's (1986) analysis of the elaboration likelihood model and advancement of Kahneman's (1973) elastic capacity model of information processing might offer fertile grounds for extensions and refinements of the message processing model proposed in this study. In particular, Stiff's work with the elastic capacity model raises a number of questions concerning the effects of need for cognition upon elastic capacity and information processing. If people who are high in the need for cognition are operating at high capacity, are they then operating in a single mode of processing (as opposed to dual mode processing), or do they simply have a higher capacity to call upon? Doubtlessly, the probabilogical, reasoned

action, elaboration likelihood and the message processing model explored in this study could all benefit from a synthesis within an information processing model such as the Kahnenman's (1973) elastic capacity model.

Following and concurrently with the modifications and extensions of the research reported in this report, there is a need to replicate and extend the findings of this study with a variety of messages, persuasive contexts and subjects. In particular there is a need to move out of the "editorial" issue frame employed in this study and into more common interpersonal influence situations (see Miller & Burgoon, 1978).

Finally, a number of new and revised measurement instruments were employed in this investigation. Aside from the need to resolve difficulties with the measurement of the detection of reasoning error, the evidence evaluation and message elaboration scales require validation. In addition, the message evaluation scales derived largely from Burgoon (1972) require further exploration and testing.

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Appendix A
Justification for the use of traditional logic in the study of social influence

Hempel (1965) in offering an analysis of rationality as an explanatory concept points out that "the concept of rationality is by on [sic] means as clear and unequivocal as is sometimes implied in the literature on rational explanation" (p. 477). For example, among communication scholars, there are vast differences of opinion on the notion of rationality (see Reynolds & Mineo, 1984). Some communication scholars discuss rationality as if it amounts to conforming to social norms (e.g., Hawes, 1976) and, therefore, "rationality [is] a rhetorical totem and a field standard but not a human characteristic" (Willard, 1983, p. 88). Some scholars have examined models of decision making (e.g., see Wyer & Carlston, 1979) as representing models of rationality. The prevailing view of rationality, however, involves some connection to formal standards of (primarily deductive) logic (e.g., Miller, 1969; Steinfatt, Miller, & Bettinghaus, 1974; Jackson, 1982; Ray & Findley, 1984) such that the "concept of a rational agent [is] . . . viewed as an idealized explanatory model comparable to the explanatory concept of an ideal gas" (Hempel, 1965, p. 477).

It is somewhat in vogue to challenge any view of man as a rational creature. These challenges, however, seem to emerge from the abstractness of modern logic, the poverty of the Enlightenment era view of "rationality [as] God's secular counterpart" (Willard, 1983, p. 89), and 20th century existentialist dread (Barrett, 1958) as well as philosophical inquiry into the ampliativity of deduction and the justification of induction (see Salmon, 1967).

To a lesser extent, the challenges to the view of man as a rational creature have been based on empirical studies of human inference making. Amazingly, research reports that document consistent patterns of reasoning errors (e.g., Woodworth & Sells, 1935; Chapman & Chapman, 1959; Janis & Frick, 1943) seem to be often cited by others (e.g., Jackson, 1982; Evans, 1980) in support of the claim that humans are not rational. In such light, McGuire's (1960a) claim that "rational consistency is neither nonexistent nor absolute" (p. 101) is worth repeating. Obviously, if human rationality did not vary, it would not have attracted centuries of study and comment.

What is important is that the empirical research, in general, is supportive of the conclusion that humans are capable of, and tend towards, reasoning in a manner homomorphic with the traditional rules of logic. The early theorizing on reasoning errors, such as Woodworth and Sell's atmosphere effect hypothesis, was not advanced as an alternative to logical processes but rather as an explanation of the problems inherent in responding to inconclusive syllogistic premise pairs. An examination of the reports (Woodworth & Sells, 1935; Sells, 1936; Sells & Koop, 1937; Chapman and Chapman, 1969; Begg & Denny, 1969) reveals that for premise sets where a conclusion was logically derivable, the subjects tended to reach logical conclusions. Similarly, in Jackson's (1982) comparison of the atmosphere hypothesis and the ambiguity hypothesis (Steinfatt, 1970), the atmosphere hypothesis was superior in accounting for reasoning errors. But, the preponderance of responses to the reasoning tasks were consistent with logic. Hample (1979b) reviewed the empirical literature

on logical processes and concluded that the weight of evidence favored the view that cognitive processes are logical (cf. Evans, 1980). Wason and Johnson-Laird (1972, p. 44) report that the accuracy of logical conclusions to modus ponens (if p, then q; p; therefore q) is so high that this inference pattern is fundamental and common to human thought. On the other hand, there is evidence that people are more likely to commit reasoning errors when the premises contain negative terms (e.g., Roberge, 1971; Wason & Johnson-Laird, 1972), abstract terms (see Wason & Johnson-Laird, 1972), terms that are restricted to particular contexts (Ray & Findley, 1984), or when the conclusion is discrepant with the individual's preexisting attitude (Janis & Frick, 1943). In short, violations of the rules of traditional logic can be subsumed under conditional statements about the nature of the reasoning task or the reasoner.

Mineo (1983) and Evans (1980) question the use of traditional rules of logic in assessments of human reasoning. Evans (1980), for example, argues "that systems of formal logic are not intended as hypotheses about the nature of thought, but as techniques for answering the correctness of argument. We would not, for example, pose as a general question `do people think mathematically?'" (p. 228). But, of course, the presupposition that logic or mathematics are social inventions does not deny the utility in studying how people perform these skills. We would not, for example, consider the same argument as grounds for dispensing with the study of language, politics, business or, for that matter, persuasion. Moreover, Aristotle (as well as many others) did envision

rationality as uniquely human and the early beginning of the study of logic began with the examination of refutational techniques (Bochenski, 1956/1961). The contention by some scholars (e.g., Evans, 1980; Mineo, 1983) that formal logic is an inadequate model of human thought is indisputable and they should be encouraged in their efforts to explore actual inference patterns. For now, however, we may use traditional logic (not as a Godhead or as an irrelevant tool, but) as a model of human reasoning on the grounds that: 1) "no other model [of reasoning] yet proposed describes the facts with fewer deviations" (Johnson, 1968), and 2) the model is extensional and, therefore, provides a common ground for analysis and comparison.

Appendix B

Messages

VALID ARGUMENTS, STRONG EVIDENCE, ALLITERATION

One of the highest concerns of our society is the health and hopefulness of humanity. This concern has resulted in legislation which has provided specialized health care programs for the elderly, the poor and the unemployed. While these programs have benefited many people, several segments of our society remain in desperate need of adequate health care. In fact, one of the groups which needs care the most, heroin users, has actually been helped the least by current policies. More often than not, the laws regulating the sale of heroin in this country have done more harm than good. While many arguments concerning legalization of heroin sales involve issues other than health care, we feel that our major focus should be on health-related issues.

Present criminal sanctions against the sale of heroin were, in part, designed to protect the American citizens from the medical harms which were once thought caused by the drug. The result of those laws, however, is that many addicts face dramatically dreary deaths from diseases caused not by heroin, but from secondary complications which are promoted by the drug's continued illegality. For example, in 1979, a team of medical researchers from the Federal Drug Enforcement Administration reported in the New England Journal of Medicine that over 900 addicts died in New York City from tetanus and hepatitis. These deaths were not caused by heroin, but were the result of improper means of injection. Since hypodermic syringes cannot be obtained legally, users are forced to reuse and share needles, or they improvise with objects not designed for injecting drugs into the bloodstream. Thus the laws that ban the sale and personal use of heroin actually cause a significant number of heroin-related deaths each year.

A second health hazard issue that we cannot ignore is that illicit heroin is impure and, thus, intrinsically injurious. Because the drug is available only on the illicit market, it is haphazardly prepared by street dealers who have little concern about the health of their clients. Since users are never sure of the amount or quality of the heroin they purchase, they are often unable to regulate the dosage of the drugs they take. Consequently, many heroin users accidentally die each year from drug overdose. According to the New York Times, research by Dr. Al Jordan, of The Harvard Medical School, "shows that when heroin users know the actual strength of the drug they're using, deaths and medical problems caused by overdosing are virtually eliminated." If the sale of heroin were legalized, the government would be in a position to enforce quality controls on the heroin sold, thus saving many lives each year.

Since the cost of illegal heroin is so excessive, users are often unable to afford the expenditures essential for escaping poor health. Addicts' failure to get needed nutrition, medication and doctors' care is directly linked to their being forced to use all of their resources to pay inflated black market prices for the drug. Professor William D. Shintig of the UCLA Center for Drug Addiction

Research recently wrote in the UCLA Law Review that "estimates by several independent researchers indicate that heroin addicts spend eighty-five percent or more of their income on the drug." Under a system of legalized heroin sales, the price of the drug would be greatly reduced and users could afford other essential health-related products.

A fourth dimension that must be discussed is whether heroin is actually a dangerous or damaging drug. Users of a drug that is not physically damaging can lead normal lives. Medical authorities from the World Health Organization now agree that heroin causes little physical damage. In addition, a team of researchers from Johns Hopkins University reported at a recent congressional hearing that the symptoms of heroin withdrawal are much less dangerous than those associated with the withdrawal from alcohol. Therefore, when assured of the legal supply of the drug, the heroin user is capable of leading a meaningful and productive life.

Various arguments can be used to support the legalized sale of heroin. We feel, however, that even considering only the health care benefits, removing secondary infection, reducing the risk of overdoses, raising the availability of nutrition and medication, and recognizing the evidence that heroin itself causes little physical damage, justify the legalization of the sale of heroin in the United States.

VALID ARGUMENTS, STRONG EVIDENCE, NO ALLITERATION

One of the major concerns of our society is the health and welfare of its citizens. This concern has resulted in legislation which has provided specialized health care programs for the elderly, the poor and the unemployed. While these programs have benefited many people, several segments of our society remain in desperate need of adequate health care. In fact, one of the groups which needs care the most, heroin users, has actually been helped the least by current policies. More often than not, the laws regulating the sale of heroin in this country have done more harm than good. While many arguments concerning legalization of heroin sales involve issues other than health care, we feel that our major focus should be on health-related issues.

Present criminal sanctions against the sale of heroin were, in part, designed to protect the American citizens from the medical harms which were once thought caused by the drug. The result of those laws, however, is that many heroin addicts are dying needlessly from diseases caused not by heroin, but from secondary complications which are promoted by the drug's continued illegality. For example, in 1979, a team of medical researchers from the Federal Drug Enforcement Administration reported in the New England Journal of Medicine that over 900 addicts died in New York City from tetanus and hepatitis. These deaths were not caused by heroin, but were the result of improper means of injection. Since hypodermic syringes cannot be obtained legally, users are forced to reuse and share needles or improvise with objects not designed for injecting drugs into the bloodstream. Thus the laws that ban the sale and personal use of heroin actually cause a significant number of heroin-related deaths each year.

A second health hazard faced by the user is the purchase of impure heroin. Because the drug is available only on the illicit market, it is haphazardly prepared by street dealers who have little concern about the health of their clients. Since users are never sure of the amount or quality of the heroin they purchase, they are often unable to regulate the dosage of the drugs they take. Consequently, many heroin users accidentally die each year from drug overdose. According to the New York Times, research by Dr. Al Jordan, of The Harvard Medical School, "shows that when heroin users know the actual strength of the drug they're using, deaths and medical problems caused by overdosing are virtually eliminated." If the sale of heroin were legalized, the government would be in a position to enforce quality controls on the heroin sold, thus saving many lives each year.

Since the cost of illegal heroin is so excessive, users are often unable to afford items essential for maintaining good health. Addicts' failure to get needed nutrition, medication and doctors' care is directly linked to their being forced to use all of their resources to pay inflated black market prices for the drug. Professor William D. Shintig of the UCLA Center for Drug Addiction Research recently wrote in the UCLA Law Review that "estimates by several independent researchers indicate that heroin addicts spend eighty-five percent or

more of their income on the drug." Under a system of legalized heroin sales, the price of the drug would be greatly reduced and users could afford other essential health-related products.

A fourth issue that must be considered is whether the use of heroin constitutes a real health problem. Users of a drug that is not physically damaging can lead normal lives. Medical authorities from the World Health Organization now agree that heroin causes little physical damage. In addition, a team of researchers from Johns Hopkins University reported at a recent congressional hearing that the symptoms of heroin withdrawal are much less dangerous than those associated with the withdrawal from alcohol. Therefore, when assured of the legal supply of the drug, the heroin user is capable of leading a meaningful and productive life.

Various arguments can be used to support the legalized sale of heroin. We feel, however, that even considering only the health care benefits, eliminating secondary infection, reducing the number of overdoses, and increasing the availability of nutrition and medication, coupled with the evidence that heroin itself causes little physical damage, justify the legalization of the sale of heroin in the United States.

VALID ARGUMENTS, WEAK EVIDENCE, ALLITERATION

One of the highest concerns of our society is the health and hopefulness of humanity. This concern has resulted in legislation which has provided specialized health care programs for the elderly, the poor and the unemployed. While these programs have benefited many people, several segments of our society remain in desperate need of adequate health care. In fact, one of the groups which needs care the most, heroin users, has actually been helped the least by current policies. More often than not, the laws regulating the sale of heroin in this country have done more harm than good. While many arguments concerning legalization of heroin sales involve issues other than health care, we feel that our major focus should be on health-related issues.

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Since the cost of illegal heroin is so excessive, users are often unable to afford the expenditures essential for escaping poor health. Addicts' failure to get needed nutrition, medication and doctors' care is directly linked to their being forced to use all of their resources to pay inflated black market prices for the drug. Bill "Fetch" Shintig of the National Coalition for the legalization of Marijuana claims that "heroin addicts depend on others to supply

them with food and clothes because they can barely find the resources to pay the high costs of the drug." Under a system of legalized heroin sales, the price of the drug would be greatly reduced and users could afford other essential health-related products.

A fourth dimension that must be discussed is whether heroin is actually a dangerous or damaging drug. Users of a drug that is not physically damaging can lead normal lives. It is now commonly agreed that heroin causes little physical damage. In addition, a health and nutrition researcher from the University of Arkansas claims that the symptoms of heroin withdrawal are about as bad as those associated with the withdrawal from extreme cases of alcoholism. Therefore, when assured of the legal supply of the drug, the heroin user is capable of leading a meaningful and productive life.

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Since the cost of illegal heroin is so excessive, users are often unable to afford items essential for maintaining good health. If, however, addicts' did get needed nutrition, medication and doctors' care they would not be forced to use all of their resources to pay inflated black market prices for the drug. Professor William D. Shintig of the UCLA Center for Drug Addiction Research recently wrote in the UCLA Law Review that "estimates by several independent

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Appendix C

Measurement Instruments

Communication Research
Fall 1985

Introduction

In order to improve on research and education in communication, the research faculty of the communication studies department must compare several different messages. Some of these messages may be selected for future communication experiments. You are asked to aid in this effort by reading and providing your reactions to the following message. In order to increase the accuracy of the comparisons it is important that you read the message as you would any other message.

PLEASE READ THE MESSAGE AS IF YOU ARE READING IT IN A MAGAZINE OR THE OPINION SECTION OF A NEWSPAPER

It is very important that everyone follow similar procedures in the completion of this booklet of materials. Therefore, please follow the instructions very carefully. Since the other people participating in this effort may be reading and responding to different messages it is important that you do not talk or distract others while completing the materials. If you have a question or need assistance, please raise your hand and wait for the research assistant to come to you. After you finish reading this page, turn to the next page and begin reading the message. When you finish reading the message continue to the response section of the booklet. When you have completed the materials please turn this booklet face down and await further instructions. Thank you very much for your cooperation.

In order to help us keep track of the booklets, please list the last four digits of your social security number in the spaces provided below. This information will be used only to identify the booklets and will not be used to identify you with your responses.

LAST FOUR DIGITS OF YOUR SOCIAL SECURITY NUMBER

___ ___ ___ ___

PLEASE READ THE FOLLOWING VERY CAREFULLY

On the following pages you will find a series of statements and objects followed by several scales. Please mark each scale in the blank that BEST represents how you feel about the statement or object. For example, here is an item like the ones you will see:

The United States should withdraw from the United Nations.

Good ___:___:___:___:___:___:___ Bad

Your job is to place a check mark (X) above the line that best indicates your feeling toward the statement. For example, if you feel that U.S. withdrawal would be a very good idea, you would check as follows:

Good _X_:___:___:___:___:___:___ Bad

If you feel such a move (withdrawal) would be slightly beneficial, you would check as follows:

Good ___:___:_X_:___:___:___:___ Bad

If you feel neutral or indifferent about the proposition, or if you feel that particular scale is irrelevant to the proposition, you would check as follows:

Good ___:___:___:_X_:___:___:___ Bad

Remember: Fill out every scale and never make more than one mark on a single scale. Thank you for your cooperation.

1. The sale of heroin should be legalized in the United States.

Incorrect	___	___	___	___	___	___	Correct
True	___	___	___	___	___	___	False
Probable	___	___	___	___	___	___	Improbable
Unlikely	___	___	___	___	___	___	Likely

2. The legalization of the sale of heroin in the United states to improve addicts' health would be.

Bad	___	___	___	___	___	___	Good
Valuable	___	___	___	___	___	___	Worthless
Foolish	___	___	___	___	___	___	Wise
Pleasant	___	___	___	___	___	___	Unpleasant
Desirable	___	___	___	___	___	___	Undesirable

3. Please indicate your reactions to the message you have just read.

Accurate	___	___	___	___	___	___	Inaccurate
Unbelievable	___	___	___	___	___	___	Believable
Valid	___	___	___	___	___	___	Invalid
Good	___	___	___	___	___	___	Bad
Wise	___	___	___	___	___	___	Foolish
Responsible	___	___	___	___	___	___	Irresponsible
Logical	___	___	___	___	___	___	Illogical
Powerful	___	___	___	___	___	___	Weak
Mild	___	___	___	___	___	___	Strong
Poorly reasoned	___	___	___	___	___	___	Well reasoned
Clear	___	___	___	___	___	___	Unclear
Supported	___	___	___	___	___	___	Unsupported
Unconvincing	___	___	___	___	___	___	Convincing
Effective	___	___	___	___	___	___	Ineffective
Unsound	___	___	___	___	___	___	Sound
Well written	___	___	___	___	___	___	Poorly written
Compelling	___	___	___	___	___	___	Uncompelling
Disorganized	___	___	___	___	___	___	Organized
Rational	___	___	___	___	___	___	Irrational

4. Please indicate your reactions to the language in the message you have just read.

Predictable	___	___	___	___	___	___	Unpredictable
Unexpected	___	___	___	___	___	___	Expected
Anticipated	___	___	___	___	___	___	Unanticipated
Not surprising	___	___	___	___	___	___	Surprising

5. We would like to know what you think the source of the message believes.

A. It is because heroin and hypodermic syringes are illegal that addicts use improper means of injecting the drug.

A* It is because heroin addicts use improper means of injection that the drug and hypodermic syringes cannot be obtained legally.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

B. Many of the heroin related deaths each year are the result of improper means of injecting the drug.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

C. The laws that ban the sale and use of heroin actually cause a significant number or heroin related deaths each year.

C* Reducing the significant number of heroin related deaths would eliminate the need for laws that ban the sale and use of heroin.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

D. Because street heroin is impure, many addicts overdose on the drug.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

*Statements specific to the invalid arguments. Only those statements specific to the version of the message read were encountered.

E. It is because heroin is illegal that addicts use impure heroin.

E* It is because street heroin is impure that heroin is illegal.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

F. It is because heroin is illegal that many addicts overdose on the drug.

F* It is because many addicts overdose that heroin is illegal.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

G. If the use of heroin was legalized, the price of the drug would be greatly reduced.

G* If addicts received proper health care, they would not be forced to use all of their resources to pay for the drug.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

H. If the price of heroin was greatly reduced, addicts could afford other essential health related products.

The source of the message thinks that the statement above is:

Unlikely	___	___	___	___	___	___	___ Likely
Incorrect	___	___	___	___	___	___	___ Correct
True	___	___	___	___	___	___	___ False
Probable	___	___	___	___	___	___	___ Improbable

I. If heroin was legalized, addicts could afford other essential health related products.

I* If the price of heroin was greatly reduced, the sale of heroin could be legalized.

The source of the message thinks that the statement above is:

Unlikely	___:___:___:___:___:___:___	Likely
Incorrect	___:___:___:___:___:___:___	Correct
True	___:___:___:___:___:___:___	False
Probable	___:___:___:___:___:___:___	Improbable

J. Users of a drug that is not physically damaging, can lead normal lives.

J* If you lead a normal life, then the use of a drug need not be physically damaging.

The source of the message thinks that the statement above is:

Unlikely	___:___:___:___:___:___:___	Likely
Incorrect	___:___:___:___:___:___:___	Correct
True	___:___:___:___:___:___:___	False
Probable	___:___:___:___:___:___:___	Improbable

K. The use of heroin causes little physical damage.

The source of the message thinks that the statement above is:

Unlikely	___:___:___:___:___:___:___	Likely
Incorrect	___:___:___:___:___:___:___	Correct
True	___:___:___:___:___:___:___	False
Probable	___:___:___:___:___:___:___	Improbable

L. Heroin users can lead a normal life.

L* If heroin users lead normal lives, then there is no need to keep the supply and use of the drug illegal.

The source of the message thinks that the statement above is:

Unlikely	___:___:___:___:___:___:___	Likely
Incorrect	___:___:___:___:___:___:___	Correct
True	___:___:___:___:___:___:___	False
Probable	___:___:___:___:___:___:___	Improbable

6. The evidence presented in the message was:

A. Inconsistent with the arguments being advanced.
Agree ___:___:___:___:___:___:___ Disagree
B. Current to the issue today.
Agree ___:___:___:___:___:___:___ Disagree
C. Sufficient to prove the points being supported.
Agree ___:___:___:___:___:___:___ Disagree
D. Not typical of what is known about this problem.
Agree ___:___:___:___:___:___:___ Disagree
E. Irrelevant to the conclusions drawn in the message.
Agree ___:___:___:___:___:___:___ Disagree
F. Not clear and understandable.
Agree ___:___:___:___:___:___:___ Disagree
G. Documented well enough so that any reader could look it up.
Agree ___:___:___:___:___:___:___ Disagree
H. Contained clear and understandable statistical information.
Agree ___:___:___:___:___:___:___ Disagree
I. Taken as a whole, supported the point being made.
Agree ___:___:___:___:___:___:___ Disagree
J. Came from experts on the topic.
Agree ___:___:___:___:___:___:___ Disagree
K. Came from persons who were biased on the topic.
Agree ___:___:___:___:___:___:___ Disagree
L. Came from credible magazines or books.
Agree ___:___:___:___:___:___:___ Disagree

7. While reading the message were you:

A. Attempting to analyze the issues in the message.
Agree ___:___:___:___:___:___:___ Disagree
B. Not very attentive to the ideas.
Agree ___:___:___:___:___:___:___ Disagree
C. Deep in thought about the message.
Agree ___:___:___:___:___:___:___ Disagree
D. Unconcerned with the ideas.
Agree ___:___:___:___:___:___:___ Disagree
E. Extending a good deal of cognitive effort.
Agree ___:___:___:___:___:___:___ Disagree
F. Distracted by other thoughts not related to the message.
Agree ___:___:___:___:___:___:___ Disagree
G. Not really exerting your mind.
Agree ___:___:___:___:___:___:___ Disagree

H. Doing your best to think about what was written.
Agree ___:___:___:___:___:___:___ Disagree

I. Reflecting on the implications of the arguments.
Agree ___:___:___:___:___:___:___ Disagree

J. Resting your mind.
Agree ___:___:___:___:___:___:___ Disagree

K. Searching your mind in response to the ideas.
Agree ___:___:___:___:___:___:___ Disagree

L. Taking it easy.
Agree ___:___:___:___:___:___:___ Disagree

8. We would like to know how you describe yourself:

A. I would prefer complex to simple problems.
Agree ___:___:___:___:___:___:___ Disagree

B. I like to have the responsibility of handling a situation that requires a lot of thinking.
Agree ___:___:___:___:___:___:___ Disagree

C. Thinking is not my idea of fun.
Agree ___:___:___:___:___:___:___ Disagree

D. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities.
Agree ___:___:___:___:___:___:___ Disagree

E. I try to anticipate and avoid situations where there is a likely chance I will have to think in depth about something.
Agree ___:___:___:___:___:___:___ Disagree

F. I find satisfaction in deliberating hard and for long hours.
Agree ___:___:___:___:___:___:___ Disagree

G. I only think as hard as I have to.
Agree ___:___:___:___:___:___:___ Disagree

H. I prefer to think about small, daily projects to long-term ones.
Agree ___:___:___:___:___:___:___ Disagree

I. I like tasks that require little thought once I've learned them.
Agree ___:___:___:___:___:___:___ Disagree

J. The idea of relying on thought to make my way to the top appeals to me.
Agree ___:___:___:___:___:___:___ Disagree

K. I really enjoy a task that involves coming up with new solutions to problems.
Agree ___:___:___:___:___:___:___ Disagree

L. Learning new ways to think doesn't excite me very much.
Agree ___:___:___:___:___:___:___ Disagree

M. I prefer my life to be filled with puzzles that I must solve.
Agree ___:___:___:___:___:___:___ Disagree

N. The notion of thinking abstractly is appealing to me.
Agree ___:___:___:___:___:___:___ Disagree

O. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.
Agree ___:___:___:___:___:___:___ Disagree

P. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.
Agree ___:___:___:___:___:___:___ Disagree

Q. It's enough for me that something gets the job done; I don't care how or why it works.
Agree ___:___:___:___:___:___:___ Disagree

R. I usually end up deliberating about issues even when they do not affect me personally.
Agree ___:___:___:___:___:___:___ Disagree

Appendix D

Supplementary tables

Table 2
Comparisons of scores for the
Source's belief in the propostions

VALID ARGUMENTS		INVALID ARGUMENTS
PA1. It is because heroin and hypodermic syringes are illegal that addicts use improper means of injecting the drug.		PA1.* It is because heroin addicts use improper means of injection that the drug and hypodermic syringes cannot be obtained legally.
Means: .87		.54
	F = 67.94, df = 1/239, p = .000	
PB1. Many of the heroin related deaths each year are the result of improper means of injecting the drug.		PB1. Many of the heroin related deaths each year are the result of improper means of injecting the drug.
Means: .86		.84
	F = .17, df = 1/239, p = .68	
PC1. The laws that ban the sale and use of heroin actually cause a significant number of heroin related deaths each year.		PC1.* Reducing the significant number of heroin related deaths would actually eliminate the need for laws that ban the sale and use of heroin.
Means: .81		.66
	F = 15.10, df = 1/239, p = .000	
PA2. Because street heroin is impure, many addicts overdose on the drug.		PA2. Because street heroin is impure, many addicts overdose on the drug.
Means: .84		.85
	F = .02, df = 1/239, p = .90	
PB2. It is because heroin is illegal that addicts use impure heroin.		PB2.* It is because street heroin is impure that heroin is illegal.
Means: .71		.39
	F = 53.22, df = 1/239, p = .000	
PC2. It is because heroin is illegal that many addicts overdose on the drug.		PC2.* It is because many addicts overdose that heroin is illegal.
Means: .53		.58
	F = .90, df = 1/239, p = .35	

Table 2 (cont.)

PA3. If the use of heroin was legalized, the price of the drug would be greatly reduced.			PA3.* If addicts received proper health care, they would not be forced to use all of their resources to pay for the drug.
Means:	.87		.61
	F = 48.77, df = 1/239, p = .000		
PB3. If the price of heroin was greatly reduced, addicts could afford other essential health related products.			PB3. If the price of heroin was greatly reduced, addicts could afford other essential health related products.
Means:	.82		.70
	F = 9.59, df = 1/239, p = .002		
PC3. If heroin was legalized, addicts could afford other essential health related products.			PC3.* If the price of heroin was greatly reduced, the sale of heroin could be legalized.
Means:	.79		.40
	F = 91.67, df = 1/239, p = .000		
PA4. Users of a drug that is not physically damaging, can lead normal lives.			PA4* If you lead a normal life, than the use of a drug need not be physically damaging.
Means:	.77		.72
	F = 1.55, df = 1/239, p = .215		
PB4. The use of heroin causes little physical damage.			PB4. The use of heroin causes little physical damage.
Means:	.75		.73
	F = .18, df = 1/239, p = .68		
PC4. Heroin users can lead a normal life.			PC4.* If heroin users lead normal lives, then there is no need to keep the supply and use of the drug illegal.
Means:	.74		.71
	F = .41, df = 1/239, p = .52		

Table 3
Comparisons of reasoning errors
for each argument and the
arguments combined

	Valid	Invalid	F	Sig.
Argument 1:				
Predicted on the basis of mean scores for the individual propositions:	.21	.06		
Obtained:	.33	.18	14.98	.000
Argument 2:				
Predicted on the basis of mean scores for the individual propositions:	.25	.07		
Obtained:	.28	.21	3.47	.064
Argument 3:				
Predicted on the basis of mean scores for the individual propositions:	.23	.08		
Obtained:	.28	.16	12.70	.000
Argument 4:				
Predicted on the basis of mean scores for the individual propositions:	.18	.16		
Obtained:	.19	.17	.64	.NS
Total for the arguments combined predicted on the basis of mean scores for the individual propositions:	1.08	.72		
Obtained:	1.07	.72	23.78	.000

Table 4

Factor analyses of belief

and attitude scales

Orthogonal rotation		Oblique rotation	
		Factor 1	Factor 2
Scale		Attitude	Belief
Correct-incorrect	.79	.39	.46
True-false	.81	.31	.58
Probable-improbable	.74	-.05	.93
Likely-unlikely	.69	-.03	.85
Good-bad	.83	.91	-.06
Valuable-worthless	.86	.92	-.01
Wise-foolish	.90	.91	.02
Pleasant-unpleasant	.73	.71	.04
Desireable-undesireable	.81	.77	.07
Eigenvalue	6.06	6.03	0.95
% of variance	.67	.67	.11
Reliability	.94	.93	.89
Correlation between factors			.73 (.80)

Table 5

Correlation matrix

	Ncog	Valid	Evid	Style	Exp	Att	Elab	DRE	EE	ME	B
Ncog	1.00										
Valid	-.03	1.00									
Evid	.00	.01	1.00								
Style	-.02	-.03	-.02	1.00							
Exp	.13	.06	.04	-.04	1.00						
Att	-.06	.04	.02	-.09	.15	1.00					
Elab	.31	.07	.09	-.04	.03	.00	1.00				
DRE	-.15	-.30	.01	.02	.02	.10	-.14	1.00			
EE	-.02	.20	.16	.03	.27	.36	.11	.03	1.00		
ME	-.08	.17	.04	-.02	.21	.54	.00	.09	.70	1.00	
B	-.05	.01	.00	-.03	.15	.73	.00	.13	.34	.51	1.00

Where:

Att = Attitude

B = Belief

DRE = Detection of reasoning error

EE = Evidence evaluation

Elab = Elaboration

Evid = Evidence strength

Exp = Expectancy

ME = Message evaluation

Ncog = Need for cognition

Style = Message style (aliteration)

Valid = Argument validity