

The Case for Noncognitive Determinants of Attitude: A Critique of Fishbein and Middlestadt

Paul W. Miniard

*Department of Marketing and Business Environment
Florida International University*

Michael J. Barone

*Department of Marketing
Iowa state University*

In this article, we raise several concerns regarding Fishbein and Middlestadt's (F & M, 1995) analysis of noncognitive attitudinal effects. First, we question F & M's focus on correlational evidence and review experimental evidence concerning noncognitive influences on attitudes that are immune to F & M's criticisms. Second, we note the potential for interpretations of the F & M findings that sustain the possibility of the influence of noncognitive factors in attitude formation. In making a case for noncognitive effects on attitude, we recommend an increased emphasis on identifying the particular processes by which such effects might occur.

Is there evidence that attitudes may be affected by noncognitive factors? Fishbein and Middlestadt (F & M; 1995) recently posed this question, followed by a thoughtful analysis of the potential problems that may arise when researchers employ certain correlational analyses in assessing the attitudinal influence of cognitive and noncognitive factors. F & M "argue that findings indicating that variables other than beliefs and their evaluative aspects contribute to attitude formation and change can best be viewed as methodological artifacts resulting from the use of inappropriate predictors and/or criteria" (p. 184). Data are then presented

Requests for reprints should be sent to Paul W. Miniard, Florida International University, College of Business Administration, Department of Marketing and Business Environment, Miami, FL 33199.

that purportedly show how a noncognitive factor is a significant predictor only when the cognitive factor is assessed in ways that are impaired methodologically.¹

Our concerns with F & M's article are twofold. First, their analysis focuses only on correlational evidence, apparently ignoring significant experimental evidence that is not susceptible to the problems F & M describe. Accordingly, we briefly review this experimental evidence and consider its implications for whether attitudes are affected by noncognitive factors. Second, we describe why the findings presented by F & M may be interpreted very differently than they interpret them. We conclude with the implications of our analysis for the role of noncognitive factors in attitude formation and stress future research priorities.

THE CASE FOR NONCOGNITIVE DETERMINANTS OF ATTITUDE

In a correlational approach to examining the determinants of attitude, participants' responses to measures of cognitive and noncognitive factors are related to their attitudinal judgments. Various analytical techniques (e.g., regression, path analysis) can then be used to estimate the strength of the factors' direct and indirect effects. We note two general problems with F & M's singular focus on the correlational approach. First, F & M's concern represents what is fundamentally an issue of causation: Do noncognitive factors *cause* attitude formation or change? As such, a correlational methodology is not sufficient, in that "discovering that two variables are correlated can never (without other evidence) provide unequivocal proof of causality" (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990, pp. 29–30). In contrast, an experimental approach offers researchers the degree of control necessary for delineating cause-and-effect relationships among variables. At a minimum, an analysis of the possible artifactual nature of noncognitive effects on attitude should include a consideration of *both* correlational and experimental evidence.

Second, F & M illustrate how methodological changes can dramatically affect one's findings about the relative influence of cognitive and noncognitive determinants. Although F & M focus on instances in which methodology may lead to an *overestimation* of the influence of noncognitive factors, it is also possible for methodology to cause an *underestimation*, a possibility we return to in the following section.

¹Following F & M, we have retained their use of the cognitive versus noncognitive terminology. Nonetheless, we recognize the inappropriateness of labeling all nonbelief-based processes of attitude formation as "thoughtfree" or "cognition-free" (p. 182). As but one example, cognitions about a picture's appropriateness have been shown to partially mediate the attitudinal impact of peripheral ad pictures (Miniard, Bhatla, Lord, Dickson, & Unnava, 1991).

Fortunately, the case for noncognitive factors influencing attitude is not based solely on correlational evidence. A number of experimental studies, employing diverse operationalizations of noncognitive factors, provide compelling evidence that such factors directly affect attitudes. A selected subset of this research is summarized in the Appendix. One important feature of nearly all of the studies listed is their manipulation of elaboration, typically by varying participants' involvement, during message processing. Contemporary persuasion theories (Eagly & Chaiken, 1993; Petty & Cacioppo, 1986) predict that the attitudinal impact of the noncognitive and elaboration manipulations should interact such that greater elaboration should reduce the effect of the noncognitive manipulation. Thus, greater ability and motivation to form carefully reasoned evaluations of the attitude object should lower sensitivity to factors that are devoid of object-relevant information. This basic pattern of results is reported by each of the studies listed in the Appendix except Mitchell (1986), who did not include an elaboration manipulation.

Critically, the strength of this experimental evidence depends on the validity of the noncognitive manipulations. Some might argue that a presumed "noncognitive" manipulation inadvertently manipulated a cognitive factor; for example, stimuli that, on the surface, appear informationally devoid may still affect attitudes via inferential beliefs (e.g., Kahle & Homer, 1985; Middlestadt, 1990). Perhaps data interpreted as reflecting noncognitive attitude effects may actually be the result of participants making inferences about the product's attributes based on the noncognitive factor. From this perspective, the existence of a significant effect due to a "noncognitive" manipulation supports an *indirect* role for noncognitive factors in attitude formation, one that is mediated by cognitive factors. Consequently, to conclude that this experimental evidence indicates the potential for noncognitive factors to *directly* affect attitudes, one must be confident that the effects cannot be attributed to the formation of salient beliefs.

How might one determine whether a given manipulation is devoid of any cognitive implications? Cognitive responses are one potential indicator of how a manipulation is functioning. Content analyses of protocol records could assess whether participants derive object-relevant information from the noncognitive factor. The sensitivity of indices representing the amount and/or the favorability of cognitive responses to the noncognitive manipulation could be tested. A truly noncognitive manipulation should not affect participants' cognitive responses about the attitude object (even though other types of responses—e.g., thoughts about an ad—may be affected).

Accordingly, we examined the findings involving object-relevant cognitive responses for the studies reported in the Appendix (see the third entry presented for each study). Although the findings seem to support a noncognitive interpretation (as reflected by the lack of significant effects due to the noncognitive manipulation), the majority of these studies tested for effects on the amount rather than the favorability of cognitive responses. Sometimes, however, the favorability of cog-

nitive responses may be a more sensitive indicator of cognitive effects. For example, if a presumed noncognitive manipulation actually evoked positive object-relevant thoughts in one condition and an equivalent number of negative thoughts in the remaining condition, an index based on the amount of thoughts would be unaffected, whereas an index representing net favorability should show differences.

Moreover, cognitive response measures may not yield the most probative assessment of a manipulation's status. Sometimes such measures are unresponsive to manipulations that should have an effect (e.g., Petty, Cacioppo, & Schumann's, 1983, null effects for involvement), so null effects may be more reflective of measurement insensitivity than of a manipulation's noncognitive status. Perhaps of greater concern, at least from F & M's perspective, is that cognitive responses do not speak directly to how a manipulation is affecting cognitive structure. Consequently, a more appropriate indicator of whether a manipulation is being influential via a cognitive factor would be its impact on salient beliefs about the attitude object.

Of the studies examined, only two (Miniard, Bhatla, Lord, Dickson, & Unnava, 1991; Mitchell, 1986) measured participants' beliefs about the attitude object. Both found that the noncognitive manipulation altered attitudes without affecting beliefs. Given F & M's recommendation that cognitive structure should be operationalized using all salient attributes (not just those featured in an ad), the Mitchell (1986) study is particularly notable. Beyond asking participants to provide beliefs and evaluations for a set of attributes identified as salient (in pretests), each participant was asked to identify her or his unique set of salient attributes, which were then used in subsequent belief and evaluation measures. None of these measures were affected by the noncognitive manipulation, leading Mitchell to conclude that "different attitudes were created for brands that have the same product beliefs" (p. 18).

So what about the remaining studies that did not report whether their presumed noncognitive manipulations affected cognitive structure? Can their findings be interpreted as evidence of noncognitive influences on attitudes? Another way to evaluate the cognitive-noncognitive status of a manipulation is to examine how elaboration moderates its attitudinal effects. Manipulations of a cognitive nature (e.g., varying the strength or favorability of ad claims along salient attributes) exert a stronger attitudinal effect as elaboration increases. So if a presumed noncognitive manipulation is actually cognitive in nature, it should display this same sensitivity to elaboration. However, if the manipulation responds such that greater elaboration *reduces* its impact on attitude, the data may be viewed as strong evidence for a noncognitive interpretation. Such a pattern is observed for all studies in the Appendix that varied elaboration.

Nonetheless, would a cognitive interpretation still be plausible? In answering this question, we revisit Petty et al.'s (1983) study examining the effects of varying an ad's claims and the celebrity status of the product endorser under high- versus low-involvement conditions. The ad claim manipulation had a significant effect on

the attitudes of both low- and high-involvement participants, although this effect was much more pronounced among the latter group. In contrast, only the low-involvement participants' attitudes were affected by the endorser manipulation.

Not all agreed with Petty et al. that the endorser manipulation was noncognitive in nature. Kahle and Homer (1985), for example, suggested that the endorser "may have conveyed information about the quality and benefits of the product to the viewer" (p. 955). However, if the endorser's significant attitudinal effect observed under low involvement was due to participants inferring product-relevant information from the endorser, this effect should have at least persisted when participants were even more motivated to consider product-relevant information. In other words, the endorser manipulation should have had an even stronger effect under high involvement (as did the ad claims manipulation). We are unaware of any cognitive-based theory that can account for the Involvement \times Endorser interaction observed by Petty et al. (1983) or, more generally, of interactions between elaboration and any noncognitive factor reported in the studies listed. Noncognitive conceptualizations, on the other hand, predict precisely such interactions. The repeated experimental demonstrations of this particular interaction pattern make a compelling case that, at least in some contexts, noncognitive factors have a direct attitudinal impact.

ALTERNATIVE INTERPRETATIONS

F & M's analysis leaves significant ambiguities in how one should interpret their data. To illustrate, consider their analysis and interpretation of the data from Middlestadt, Fishbein, and Chan (1993). As shown in Table 4 of F & M (1995), the noncognitive predictor received a significant beta weight when the cognitive predictor included only beliefs about the outcomes featured in the ad. Operationalizing cognitive structure with the "full modal salient set of outcomes" (p. 199), which required participants to report their beliefs for outcomes beyond those featured in the ad, substantially increased its correlation with attitude and eliminated the significance of the noncognitive predictor. F & M presented these results as yet another example of how invalid operationalizations of cognitive structure can "create the illusion of a nonbelief-based influence on attitude" (p. 199).

A crucial assumption underlying F & M's positioning of these data is that cognitive structure is operationalized most appropriately by also including beliefs about nonfeatured outcomes. This assumption would be warranted if, in fact, participants formed beliefs about the nonfeatured outcomes (perhaps through inferences based on the featured outcomes) and employed them in forming an attitude. Suppose, however, that participants did not infer beliefs about nonfeatured attributes, thereby precluding their use during attitude formation. Under this scenario, cognitive structure represented by only the featured attributes would be

most appropriate. As a consequence, including measures for nonfeatured attributes might artificially increase the relation between cognitive structure and attitude in the following manner. When confronted with measures about unformed beliefs, participants may simply construct a response, perhaps by relying on attitude itself (e.g., through evaluative-consistency inferences; cf. Alba & Hutchinson, 1987; Dick, Chakravarti, & Biehal, 1990). In this instance, attitude determines beliefs. Therefore, including nonfeatured attributes may artificially enhance the strength of the relation between the cognitive factor and attitude. This, in turn, would reduce the opportunity for the noncognitive factor to provide an incremental contribution. Thus, the data from Middlestadt et al. (1993) could be interpreted as showing how an invalid representation of cognitive structure (i.e., the one based on featured and nonfeatured outcomes) can suppress the reality of a noncognitive influence on attitude. All of this hinges on which operationalization of cognitive structure is most appropriate. The substantive issue is whether the situation identified in the elicitation procedure adequately corresponds to the situation in which attitudes are formed. Probing specifically for the salient attributes immediately after the brand evaluation task may reveal a more limited and valid set of attributes than that identified by a noncontext-specific probe about the salient attributes for a product category.

Similarly, some of F & M's results may actually be demonstrating how method can artificially inflate the direct effects of factors that serve as antecedents of cognitive structure. Consider F & M's data on the presidential election, in which the noncognitive component are operationalized as judgments about the candidates' debate performance. These debates should be an important source of information for the creation or modification of the beliefs and attitudes of the young voters in the study. As such, it seems reasonable to view judgments about debate performance as cognitively based antecedents of cognitive structure (e.g., as cognitive responses are antecedents of beliefs in persuasion settings) than as a noncognitive factor.

By the same token, one may also question the validity of using A_{ad} to represent noncognitive factors. We recognize that F & M are not alone in viewing the relationship between A_{ad} and brand attitudes as reflective of noncognitive persuasion processes (e.g., Brown & Stayman, 1992; Dröge, 1989; MacKenzie, Lutz, & Belch, 1986; MacKenzie & Spreng, 1992). Nonetheless, Miniard, Bhatla, and Rose (1990) demonstrated that the A_{ad} -brand attitude relationship can exist even in the absence of noncognitive persuasion and that a manipulation of a cognitive factor (i.e., strength of ad claims) affected A_{ad} as well as brand attitude. Thus, in some situations, A_{ad} may represent cognitive factors.

SUMMARY AND CONCLUSION

We recognize the importance and value of F & M's observations about the impact of methodological features on findings and interpretations regarding a construct's

direct and indirect effects. Indeed, their insights should help researchers using correlational approaches to avoid potential threats to the meaningfulness of their data. We are less enthusiastic, however, about F & M's positioning their demonstrations as a serious challenge to the body of literature supporting the direct attitudinal impact of noncognitive factors. As we note, there is significant experimental evidence indicating noncognitive effects on attitude that is not subject to F & M's criticisms. Also, alternative interpretations of F & M's data suggest that the case for noncognitive factors directly influencing attitudes may be sustained even when a broader set of beliefs seemingly accentuates cognitive effects and attenuates noncognitive influences.

At the same time, we hope that F & M's comments will direct researchers' attention to closer examinations of the processes by which noncognitive factors shape attitudes. Recent persuasion research has attributed the effects of various message elements, such as the quantity of message arguments (Petty & Cacioppo, 1984), message vividness (Heath, McCarthy, & Mothersbaugh, 1994), pictures (Miniard et al., 1991; Miniard, Sirdeshmukh, & Innis, 1992), the endorser's attractiveness (Haugtvedt, Petty, & Cacioppo, 1992; Shavitt, Swan, Lowrey, & Wanke, 1994) and celebrity status (Heath et al., 1994; Petty et al., 1983; Sanbonmatsu & Kardes, 1988), and source expertise (Yalch & Elmore-Yalch, 1984) to their operation as noncognitive factors. The fact that the effects of these message elements are attenuated as elaboration increases does not imply that they share the same underlying influence process. Petty and Cacioppo (1986) stressed that the noncognitive route to persuasion subsumes a variety of theories emphasizing different constructs and processes. Yet rarely do we find an attempt to illuminate the particular noncognitive process by which these variables are influential. We have instead been content in labeling an effect as noncognitive as if, in doing so, we have provided an explanation for how this effect has come to be. Remedying this situation should lead to an enriched understanding of how nonbelief-based processes may affect attitudes.

REFERENCES

- Alba, J. W., & Hutchinson, J. W. (1987) Dimensions of consumer expertise *Journal of Consumer Research*, 13, 411-454.
- Andrews, J. C., & Shimp, T. A. (1990) Effects of involvement, argument strength, and source characteristics on central and peripheral processing of advertising. *Psychology & Marketing*, 7, 195-214
- Aronson, E., Ellsworth, P. C., Carlsmith, J. M., & Gonzales, M. H. (1990) *Methods of research in social psychology* (2nd ed.). New York: McGraw-Hill
- Brown, S. P., & Stayman, D. M. (1992). Antecedents and consequences of attitude toward the ad: A meta-analysis *Journal of Consumer Research*, 19, 34-51.
- Chaiken, S. (1980) Heuristic versus systematic information processing and the use of source versus message cues in persuasion *Journal of Personality and Social Psychology*, 39, 752-766

- Dick, A., Chakravarti, D., & Biehal, G. (1990). Memory-based inferences during consumer choice. *Journal of Consumer Research*, 17, 82-93.
- Dröge, C. (1989). Shaping the route to attitude change: Central versus peripheral processing through comparative versus noncomparative advertising. *Journal of Marketing Research*, 17, 290-303.
- Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. New York: Harcourt Brace.
- Fishbein, M., & Middlestadt, S. (1995). Noncognitive effects on attitude formation and change: Fact or artifact? *Journal of Consumer Psychology*, 4, 181-202.
- Haugtvedt, C. R., Petty, R. E., & Cacioppo, J. T. (1992). Need for cognition and advertising: Understanding the role of personality variables in consumer behavior. *Journal of Consumer Psychology*, 1, 239-260.
- Heath, T. B., McCarthy, M. S., & Mothersbaugh, D. L. (1994). Spokesperson fame and vividness effects in the context of issue-relevant thinking: The moderating role of competitive setting. *Journal of Consumer Research*, 20, 520-534.
- Kahle, L. R., & Homer, P. M. (1985). Physical attractiveness of the celebrity endorser: A social adaptation perspective. *Journal of Consumer Research*, 11, 954-961.
- MacKenzie, S. B., Lutz, R. J., & Belch, G. E. (1986). The role of attitude toward the ad as a mediator of advertising effectiveness: A test of competing explanations. *Journal of Marketing Research*, 23, 130-143.
- MacKenzie, S. B., & Spreng, R. A. (1992). How does motivation moderate the impact of central and peripheral processing on brand attitudes and intentions? *Journal of Consumer Research*, 18, 519-529.
- Middlestadt, S. E. (1990). The effect of background and ambient color on product attitudes and beliefs. In M. E. Goldberg, G. Gorn, & R. W. Pollay (Eds.), *Advances in consumer research* (Vol. 17, pp. 244-249). Provo, UT: Association for Consumer Research.
- Middlestadt, S. E., Fishbein, M., & Chan, D. K.-S. (1993). The effect of music on brand attitude: Affect or belief based change? In E. M. Clark, T. Brock, & D. Stewart (Eds.), *Attention, attitude and affect in response to advertising* (pp. 149-167). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Miniard, P. W., Bhatla, S., Lord, K. R., Dickson, P. R., & Unnava, H. R. (1991). Picture-based persuasion processes and the moderating role of involvement. *Journal of Consumer Research*, 18, 92-107.
- Miniard, P. W., Bhatla, S., & Rose, R. L. (1990). On the formation and relationship of ad and brand attitudes: An experimental and causal analysis. *Journal of Marketing Research*, 27, 290-303.
- Miniard, P. W., Sirdeshmukh, D., & Innis, D. E. (1992). Peripheral persuasion and brand choice. *Journal of Consumer Research*, 19, 226-239.
- Mitchell, A. A. (1986). The effect of verbal and visual components of advertisements on brand attitudes and attitude toward the advertisement. *Journal of Consumer Research*, 13, 12-24.
- Petty, R. E., & Cacioppo, J. T. (1984). The effects of involvement on responses to argument quantity and quality: Central and peripheral routes to persuasion. *Journal of Personality and Social Psychology*, 46, 69-81.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 123-205). New York: Academic.
- Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of argument-based persuasion. *Journal of Personality and Social Psychology*, 40, 432-440.
- Petty, R. E., Cacioppo, J. T., & Schumann, D. (1983). Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of Consumer Research*, 10, 135-146.
- Ratneshwar, S., & Chaiken, S. (1991). Comprehension's role in persuasion: The case of its moderating effect on the persuasive impact of source cues. *Journal of Consumer Research*, 18, 52-63.
- Sanbonmatsu, D. M., & Kardes, F. R. (1988). The effects of physiological arousal on information processing and persuasion. *Journal of Consumer Research*, 15, 379-385.
- Shavitt, S., Swan, S., Lowrey, T. M., & Wanke, M. (1994). The interaction of endorser attractiveness and involvement in persuasion depends on the goal that guides message processing. *Journal of Consumer Psychology*, 3, 137-162.

- Wood, W., Kallgren, C. A., & Preisler, R. M. (1985) Access to attitude-relevant information in memory as a determinant of persuasion: The role of message attributes. *Journal of Experimental Social Psychology, 21*, 73–85
- Yalch, R. F., & Elmore-Yalch, R. (1984) The effect of numbers on the route to persuasion. *Journal of Consumer Research, 11*, 522–527

Accepted by Dipankar Chakravarti and Paul M. Herr.

APPENDIX: REVIEW OF SELECTED PERSUASION STUDIES

Andrews and Shimp (1990)

*Key independent variables.*² Involvement (low, high), argument strength (weak, strong), and *source (favorable, unfavorable)*

Effects on attitude

1. Main effects of involvement and argument strength.
2. Low involvement: Attitudes influenced by both argument strength and source.
3. High involvement: Attitudes influenced by argument strength only.

Effects on object-relevant cognitive responses

1. Number of thoughts: Main effect of involvement.
2. Number of favorable thoughts: (a) main effect of involvement and (b) high-involvement participants generated more thoughts for strong versus weak claims.
3. Number of unfavorable thoughts: Involvement × Claim Strength interaction, as high-involvement participants generated more thoughts for weak versus strong claims.

Effects on object-relevant beliefs. These were not assessed.

Chaiken (1980, Study 1)

Key independent variables. Message strength (six arguments, two arguments), response involvement (low, high), and *communicator likability (likeable, unlikable)*.

²Noncognitive manipulation appears in italics

Effects on attitude

1. Main effects for message strength and communicator likability.
2. High involvement: Effect for message strength only.
3. Low involvement: Effect for communicator likability only.

Effects on object-relevant cognitive responses. No pure indices focusing solely on object-relevant thoughts were presented.

Effects on object-relevant beliefs. These were not assessed.

Haugtvedt, Petty, and Cacioppo (1992, Study 3)

Key independent variables. Need for cognition (low, high) and *endorser attractiveness* (positive, negative).

Effects on attitude

1. Main effect of endorser attractiveness.
2. Need for Cognition \times Endorser interaction: Endorser attractiveness impacted attitudes only for those low in need for cognition.

Effects on object-relevant cognitive responses. There were not enough thoughts generated to warrant analysis (see Haugtvedt et al., 1992, n. 3).

Effects on object-relevant beliefs. These were not assessed.

Miniard, Bhatla, Lord, Dickson, and Unnava (1991, Study 1)

Key independent variables. Involvement (lower, higher), claims (stronger, weaker), claims (stronger, weaker), and *picture* (attractive, unattractive).

Effects on attitude

1. Under lower involvement, attitudes were influenced only by the picture manipulation;
2. Under higher involvement, attitudes were influenced only by the claim manipulation.

Effects on object-relevant cognitive responses.

1. Content analysis of thoughts revealed only 4 of the 170 participants formed inferential beliefs about the product based on the noncognitive factor.
2. Number of thoughts: Main effect of involvement.

Effects on object-relevant beliefs. No effect of noncognitive factor.

Mitchell (1986)

Key independent variables. Picture (positive, negative, neutral, none).

Effects on attitude

1. Effect of picture type: positive > neutral = none > negative.

Effects on object-relevant cognitive responses. These were not assessed.

Effects on object-relevant beliefs. There was no effect of the noncognitive factor on responses to structured belief measures or elicited beliefs.

Petty and Cacioppo (1984)

Key independent variables. Involvement (low, high), argument quality (weak, strong), and number of arguments (three, nine).

Effects on attitude

1. Main effects of argument quality and number of arguments ($p < .06$).
2. Involvement \times Number of Arguments interaction: Number of arguments impacted attitudes only under low involvement.
3. Involvement \times Argument Quality interaction: Argument quality impacted attitudes only under high involvement.
4. Argument Quality \times Number of Arguments interaction ($p < .07$): Number of arguments impacted attitudes only for strong arguments.

Effects on object-relevant cognitive responses

1. Number of favorable thoughts: (a) main effect of argument strength and (b) Involvement \times Argument Quality interaction, with more favorable thoughts in response to strong messages for high-involvement participants only.
2. Number of unfavorable thoughts: (a) main effect of argument strength and (b) Involvement \times Argument Quality interaction, with more unfavorable thoughts in response to weak messages for high-involvement participants only.

Effects on object-relevant beliefs. These were not assessed.

Petty, Cacioppo, and Goldman (1981)

Key independent variables. Involvement (low, high), argument quality (weak, strong), and source expertise (low, high).

Effects on Attitude

1. Main effects of source expertise and argument quality.
2. Involvement \times Expertise interaction: More favorable attitudes for high versus low expertise only under low involvement.
3. Involvement \times Argument Quality interaction: More favorable attitudes for strong versus weak arguments only under high involvement.

Effects on object-relevant cognitive responses. These were not assessed.

Effects on object-relevant beliefs. These were not assessed.

Petty, Cacioppo, and Schumann (1983)

Key independent variables. Involvement (low, high), argument quality (weak, strong), and endorser (celebrity, noncelebrity).

Effects on attitude

1. Main effects of involvement, argument quality, and endorser ($p < .09$).
2. Involvement \times Endorser interaction: Endorser impacted attitudes only under low involvement.

3. Involvement \times Argument Quality interaction: Arguments influenced attitudes more under high involvement.

Effects on object-relevant cognitive responses. Number of thoughts: No significant effects.

Effects on object-relevant beliefs. These were not assessed.

Ratneswar and Chaiken (1991, Study 1)

Key independent variables. Comprehensibility (low, high) and *source expertise* (low, high).

Effects on attitude

1. Main effect of source expertise.
2. Source Expertise \times Comprehensibility: Source expertise influenced attitudes only for low comprehensibility.

Effects on object-relevant cognitive responses. Number of thoughts: Main effect of comprehensibility.

Effects on object-relevant beliefs. These were not assessed

Ratneswar and Chaiken (1991, Study 2)

Key independent variables. Comprehensibility (low, medium, high) and *source expertise* (low, high).

Effects on attitude.

1. Main effect for source expertise ($p < .1$).
2. Source Expertise \times Comprehensibility interaction ($p < .1$): Source expertise influenced attitudes only in the low-comprehensibility condition.

Effects on object-relevant cognitive responses. Number of thoughts: No significant effects.

Effects on object-relevant beliefs. These were not assessed.

Sanbonmatsu and Kardes (1988)

Key independent variables. Arousal (moderate, high), argument strength (weak, strong), and *endorser (celebrity, noncelebrity)*.

Effects on attitude

1. Main effects of argument strength and endorser.
2. Arousal × Argument Strength interaction: Argument strength impacted attitudes more under moderate versus high arousal.
3. Arousal × Endorser interaction ($p = .11$): Endorser status impacted attitudes only when arousal was high.

Effects on object-relevant cognitive responses. These were not assessed.

Effects on object-relevant beliefs. These were not assessed.

Wood, Kallgren, and Preisler (1985)

Key independent variables. Ability to retrieve attitude relevant information (low, medium, high), message quality (strong, weak), and *message length (short, long)*.

Effects on attitude

1. Main effect for retrieval ability.
2. Long messages were more persuasive for those with low versus high ability to retrieve.
3. Message Strength × Retrieval interaction ($p < .07$): Strong messages led to more favorable attitudes only for high-retrieval participants.

Effects on object-relevant cognitive responses. Number of thoughts: Main effect of retrieval ability.

Effects on object-relevant beliefs. These were not assessed.

Yalch and Elmore-Yalch (1984)

Key independent variables. Message quantitateness (no, yes) and *source expertise (low, high)*.

Effects on attitude

1. Main effect of source expertise.
2. Quantitativeness \times Expertise interaction: Source expertise impacted attitudes only for quantitative messages.

Effects on object-relevant cognitive responses. Not able to adequately determine focus of thoughts based on the analysis presented.

Effects on object-relevant beliefs. These were not assessed.