

The Role of Direction of Comparison, Attribute-Based Processing, and Attitude-Based Processing in Consumer Preference

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Preference formation involves comparing brands on specific attributes (attribute-based processing) or in terms of overall evaluations (attitude-based processing). When consumers engage in an attribute-based comparison process, the unique attributes of the focal subject brand are weighed heavily, whereas the unique attributes of the less focal referent brand are neglected. This is because the attributes of the subject are mapped onto the attributes of the referent, rather than vice versa. This direction-of-comparison effect is reduced when consumers engage in attitude-based processing or when high involvement increases motivation to process accessible attributes more thoroughly and systematically. The present research investigates a personality variable, need for cognition, that increases the likelihood of attribute-based (i.e., high need for cognition individuals) versus attitude-based processing (i.e., low need for cognition individuals) and therefore, also affects the magnitude of the direction-of-comparison effect. The direction-of-comparison effect is observed only when attribute-based processing is likely (i.e., when need for cognition is high) and when thorough and systematic processing is unlikely (i.e., when involvement is low). Mediation analyses involving attribute recall and a useful new measure of analytic versus intuitive processing support this dual-process model.

Consumers use a wide variety of information-processing strategies to judge products and to arrive at decisions. One of the most fundamental distinctions among the various strategies that have been identified is the distinction between stimulus-based versus memory-based processing (Alba, Hutchinson, and Lynch 1991; Hastie and Park 1986; Kardes 1986; Lynch and Srull 1982). In stimulus-based processing, all relevant information is directly observable in the judgment context, and consumers can readily and directly compare all brands on all attributes. By contrast, in memory-based processing, information about brands and attributes must be retrieved

from memory before judgment-relevant comparisons can be performed. Such processing is constrained by the limitations of memory and is generally considered to yield less optimal judgments (Hutchinson and Alba 1991).

In stimulus-based processing, the amount of information and the extent to which this information is scrutinized, weighed, and carefully integrated depends on the individual's motivation to form an accurate judgment (Chaiken and Maheswaran 1994; Maheswaran, Mackie, and Chaiken 1992). When concern about accuracy is high, people tend to focus heavily on relevant information and tend to be quite "data driven" and analytic (Alba and Hutchinson 1987; Hutchinson and Alba 1991). As concern about accuracy decreases, however, people become more "theory driven," or more reliant on stereotypes, preconceptions, and heuristics (Wyer and Srull 1989).

Although the distinction between analytic, data-driven processing versus intuitive, theory-driven processing has been applied mainly to stimulus-based judgment (e.g., Fiske and Neuberg 1990; Kruglanski and Freund 1983; Sujan 1985), we suggest that the distinction may also apply to memory-based judgment. If the individual is able to retrieve specific attribute information, then the judgment will be data driven, but when only summary

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impressions are retrieved, the judgment will be theory driven (Sanbonmatsu and Fazio 1990). The ability to retrieve specific attributes or general impressions may depend on many important situational and individual difference variables (Hutchinson and Alba 1991).

The Direction-of-Comparison Effect

Tversky's (1977) feature-matching model suggests that attributes are often compared in an asymmetric manner. When two brands are compared, one brand is typically the more focal subject of comparison, the other brand is the less focal referent of comparison. The focal brand tends to elicit more thoughts than the less focal brand when a judgment is made between the two brands (Dhar and Simonson 1992). One important factor that determines which brand serves as the subject of comparison and which brand serves as the referent is the order of brand presentation. Several studies have shown that the most recently observed brand serves as the subject of comparison and the earlier observed brand serves as the referent (Houston and Sherman 1995; Houston, Sherman, and Baker 1989, 1991; Kardes and Sanbonmatsu 1993; Sanbonmatsu, Kardes, and Gibson 1991). According to Tversky's (1977) model, the distinction between shared and unique attributes is crucial for understanding the comparison processes. Shared attributes are used to describe both brands, whereas unique attributes are used to describe one brand but not the other. The attributes of the subject of comparison serve as a checklist against which the attributes of the referent are compared. Attributes unique to the subject are highlighted by the directional comparison process and carry the most weight in judgments of the two brands. Conversely, attributes unique to the referent are downplayed by the directional comparison process.

For example, a person may be considering two brands of equivalent value (e.g., two calculators) sold at different stores. The brand encountered second becomes the subject of comparison because the comparison process cannot begin until two brands have been encountered. Also, assuming both brands are recalled from memory (e.g., the consumer has left both stores and is making the decision at some later time), the memories associated with the second more recently encountered brand should be more accessible, thus making the second brand likely to be the focal brand in the comparison process.

In a memory-based judgment task, when the unique attributes of both brands are positive, the subject is preferred, but when the unique attributes of both brands are negative, the referent is preferred. This is because the unique attributes of the subject are more focal and are weighed more heavily than the unique attributes of the referent. As Figure 1 shows, there is a directional bias such that when brand A is the subject of comparison, the comparison process highlights brand A's unique attributes and downplays brand B's unique attributes. By contrast, when brand B is the subject, the comparison process high-

lights brand B's unique attributes and downplays brand A's unique attributes. Consequently, when the unique attributes of both brands are positive (as in Fig. 1), the subject of comparison is preferred, whereas when the unique attributes of both brands are negative the referent is preferred. The manipulation of the valence of the unique attributes is necessary to show that the systematic differences are due to greater attention to the attributes of the subject of comparison (i.e., direction-of-comparison effect) rather than a simple primacy or recency effect.

Attribute-Based versus Attitude-Based Comparison Processes

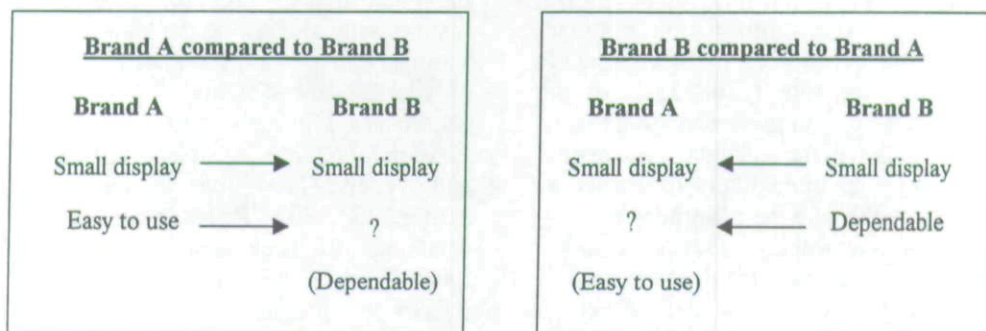
Another important factor for understanding comparison processes is the type of information that is used. Attribute-based strategies require the knowledge and use of specific attributes at the time the judgment is rendered and involve the use of attribute-by-attribute comparisons across brands. For example, if brand A shampoo leaves hair shiny and brand B shampoo does not, brand A should be preferred on this specific attribute.

However, preferences are not always based on specific attribute-by-attribute comparisons. In some cases, an overall evaluation or attitude-based strategy is used. Attitude-based processing involves the use of general attitudes, summary impressions, intuitions, or heuristics: no specific attribute-by-attribute comparisons are performed at the time of judgment. Of course, attributes may be used as heuristic cues or as cues to form general attitudes before the preference judgment is formed. However, at the time of preference judgment, general attitudes and impressions are used instead of specific attribute-by-attribute comparisons.

Another distinction between attribute-based and attitude-based judgment strategies is the time and effort associated with each. An attribute-based judgment requires the comparison of specific attributes associated with each brand. Therefore, this process will be more time consuming, effortful, and usually more accurate than the global comparisons made for an attitude-based judgment. Motivation and opportunity to process information work together to determine whether attribute-based or attitude-based processing will be used in a given situation (Sanbonmatsu and Fazio 1990). Specifically, as motivation to make a correct judgment increases and specific attributes are accessible from memory, individuals tend to use analytic, data-driven, attribute-based processing. Conversely, when attributes are inaccessible from memory, the judgment will be based on global attitudes and impressions derived from separate noncomparative evaluations of each brand formed during brand exposure. These global attitudes are influenced by both common and unique attributes (Sanbonmatsu et al. 1991) and by attributes that are difficult to compare directly across brands (Nowlis and Simonson 1997).

Although attribute-based processing is often more accurate, we suggest that the use of attribute-based pro-

FIGURE 1
DIRECTION-OF-COMPARISON PROCESS



NOTE.— *Left panel*, When A is the subject of comparison, the comparison process highlights A's unique attributes and downplays B's unique attributes. *Right panel*, When B is the subject of comparison, the comparison process highlights B's unique attributes and downplays A's unique attributes.

cessing may actually increase rather than reduce systematic biases in preference judgment due to the order in which the brands are considered. When judgments are made between brands with both common and unique attributes, the direction-of-comparison effect is strongest when attribute-based processing is encouraged and weakest when attitude-based processing is encouraged (Sanbonmatsu et al. 1991). Therefore, the use of information in the judgment process is dependent on when an evaluation is formed. It is either formed separately for each brand at the time of exposure (attitude-based processing), or comparatively when the preference judgment is made (attribute-based processing). The order in which the brands are encountered appears to influence the decision more when attribute-based processing is used.

In order to understand this effect more completely, we need to understand when attribute-based decisions are likely and when attitude-based decisions are likely. For example, personal or situational characteristics that encourage attribute-based processing may also influence the magnitude of the direction-of-comparison effect by influencing when the evaluation process takes place. Because attribute-based processing is influenced by the order of comparison while attitude-based processing is not (Sanbonmatsu et al. 1991), it seems reasonable that any individual characteristic that tends to increase elaboration at the time that the brands are presented will encourage the storage and the subsequent accessibility of specific attributes. This internal motivation to process may simply provide the means by which attributes are made accessible for consideration, but having the information may not always improve decision making because of the limited time people can devote to this effortful, data-driven analysis. Without the external motivation to process all of this information completely, asymmetric recall may produce systematic preference reversals.

Two new moderator variables relating to the direction-of-comparison effect are investigated in the present study: one personal characteristic, need for cognition (Cacioppo and Petty 1982), and one contextual variable, involve-

ment (Celsi and Olson 1988; Richins and Bloch 1986; Richins, Bloch, and McQuarrie 1992; Swinyard 1993). These variables were selected because need for cognition influences the extent to which people encode and subsequently retrieve attribute information and involvement influences processing effort during the comparison process.

The Role of Need for Cognition

Cacioppo and Petty (1982) developed a need for cognition scale that can distinguish groups based on the extent to which individuals "engage in and enjoy thinking" (p. 1). High need for cognition individuals (i.e., those who are more likely to enjoy thinking) have been shown to process and evaluate advertising information more thoroughly than low need for cognition individuals. They tend to be influenced by message-relevant thoughts rather than peripheral cues such as endorser attractiveness (Haugtvedt, Petty, and Cacioppo 1992), spokesperson credibility (Petty and Cacioppo 1986), humor (Zhang 1996), or the number of arguments (even weak arguments) presented (Cacioppo, Petty, and Morris 1983). Further, high need for cognition individuals tend to make more optimal in-store purchase decisions because they tend to react to a promotion signal (e.g., feature advertisement) only when a significant price reduction is offered. Conversely, low need for cognition individuals react when the product appears to be on special regardless of the amount of price reduction offered (Inman, McAlister, and Hoyer 1990). This research implies that high need for cognition individuals simply make more carefully thought-out and specific detail-oriented judgments. By extension, it could be argued that individuals high in need for cognition may be less likely to fall prey to a host of judgment and decision biases, including the direction-of-comparison effect. We suggest, however, that high need for cognition individuals may be more susceptible to the direction-of-comparison effect, relative to low need for cognition individuals.

The level to which message order influences judgment has been shown to be dependent on the level of message

elaboration (Haugtvedt and Wegener 1994; Haugtvedt, Wegener, and Warren 1994; Petty, Haugtvedt, and Smith 1995). It has also been shown that individuals high in need for cognition tend to process information in a more elaborate manner and are better able to recall specific attribute information at a later time (Srull, Lichtenstein, and Rothbart 1985). Therefore, in preference judgments, they are more likely to have the attribute information accessible from memory and more likely to engage in attribute-based processing than are their low need for cognition counterparts. Thus, it appears that message elaboration and need for cognition can shape the decision process by influencing how information is encoded, stored in memory, and used in making a preference judgment.

Research has shown that individuals who are high in need for cognition are more likely to encode, retain, and recall attribute information (Srull et al. 1985, experiment 2), and are likely to engage in attribute-based processing (Lynch, Marmorstein, and Weigold 1988). Therefore, because attribute-based (vs. attitude-based) processing increases the direction-of-comparison effect (Sanbonmatsu et al. 1991), high need for cognition individuals should be more prone to the direction-of-comparison effect. Conversely, attribute information is less likely to be accessible from memory during preference formation for individuals low in need for cognition, and consequently, low need for cognition individuals are less likely to engage in attribute-based processing and are less susceptible to the direction-of-comparison effect.

H1a: Need for cognition will interact with direction of comparison such that individuals who score high (low) on the need for cognition scale will be more (less) likely to use attribute-based processing during preference formation, and thus will be more (less) likely to be influenced by direction of comparison.

H1b: Individuals who are high in need for cognition will be likely to encode and store the specific attributes associated with the available options while those who are low in need for cognition will encode an overall impression of the various options. The attendant variation in level of attribute recall will mediate preference formation.

The Role of Involvement

A second important factor that may affect an individual's tendency to be influenced by the direction of comparison is involvement. Involvement can be defined as personal relevance (Petty, Cacioppo, and Schumann 1983) or an individual's subjective feeling of the importance of the judgment process or importance of the object about which the judgment is being made. There are many potential manipulations that would increase the level of personal relevance in a judgment. One specific manipulation,

"concern about accuracy," has been shown to increase motivation to process without necessarily increasing the likelihood that the decision maker will have valid information with which to make an accurate judgment (Johnson and Eagly 1989; Kruglanski 1989).

A large number of studies have reported that individuals process information more thoroughly with higher levels of involvement (e.g., Celsi and Olson 1988; Haugtvedt and Wegener 1994; Johnson and Eagly 1989; Maheswaran et al. 1992; Petty et al. 1983; Ratneshwar and Chaiken 1991; Richins and Bloch 1986; Swinyard 1993; Zaichkowsky 1985). Individuals having a high level of interest in a judgment may be more likely to spend time considering and evaluating any accessible attributes during the judgment process (Celsi and Olson 1988). This motivation to process, however, may not be sufficient, by itself, to encourage attribute-based processing. Rather, high levels of involvement may increase the likelihood of reflection and deliberation on the judgment if and only if the attributes are already accessible from memory. In the case where attitude-based processing is likely to occur (i.e., among low need for cognition individuals), the motivation provided by the involvement manipulation may do little to influence preferences because the individuals lack the information (i.e., accessible attributes) needed to make an attribute-based preference (Sanbonmatsu and Fazio 1990).

Involvement and need for cognition should interact such that need for cognition influences the likelihood of attribute- versus attitude-based processing, whereas involvement influences processing effort regardless of which type of processing task has been employed. Our hypotheses suggest that both the high and low need for cognition groups have similar involvement effects such that each group experiences an increased motivation to process with no change in the underlying processing strategy (i.e., attribute- vs. attitude-based processing). Thus, we predict a change in preference due to the change in motivation to process the accessible attributes among high need for cognition subjects and no change in preference due to the inaccessibility of the attributes for low need for cognition subjects. For low need for cognition subjects, information that was not encoded into long-term memory is lost (Wyer and Srull 1989), and it does no good to increase motivation to process information that is not available in memory.

H2a: Individuals with low levels of involvement and

- i. high need for cognition are likely to use an attribute-based processing strategy to make the judgment and hence be strongly influenced by direction of comparison.
- ii. low need for cognition are likely to use an attitude-based processing strategy and should not be influenced by the direction of comparison.

H2b: Individuals with high levels of involvement should be motivated to process the available information more fully but will be constrained by the processing strategy determined by their relative need for cognition. Therefore, those with high levels of involvement and

- i. high need for cognition are likely to use an attribute-based processing strategy, but to more fully consider all accessible attributes (both unique and common) in assessing preference. Therefore, they are less likely (than their low involvement counterparts) to be influenced by direction of comparison.
- ii. low need for cognition are likely to use an attitude-based processing strategy and, because the attributes are not available during the judgment phase, should not be influenced significantly by the direction of comparison.

Attribute Recall as a Mediator of Preference

Whereas a moderator variable specifies conditions under which a given effect is likely to occur (vs. not occur), a mediator identifies the process by which independent variables influence a dependent variable (Baron and Kenny 1986). Many of the previous studies that examined the direction-of-comparison effect have assumed (but not directly tested) recall to be a mediator of asymmetric choice. Because the previous experiments produced results that were consistent with those that would have been expected if Tversky's feature-matching model was used, prior research assumed that the participants were asymmetrically considering only the unique attributes of the focal brand during preference formation (Houston et al. 1989, 1991; Sanbonmatsu et al. 1991). In the present study, recall is hypothesized and tested as a mediator of personal and situational influences on preference judgments. Experiment 1 focuses on the impact of need for cognition and involvement on the direction-of-comparison effect, and experiment 2 is a conceptual replication and extension of experiment 1 using a different measure of preference and investigates the proposed cognitive processes via the presumed mediator: relative attribute recall. Measuring recall of attributes permits the determination of when consumers engage in attribute-based processing.

EXPERIMENT 1

Overview

A $2 \times 2 \times 2$ mixed factorial design was used. The design included one within-subject factor (high vs. low involvement), and two between-subject factors (high vs. low need for cognition and valence of the unique attributes).

Preference was examined as the dependent measure.

Stimuli

The stimuli included four brands of pens and four brands of calculators described by lists of attributes. The lists contained five positive attributes and four negative attributes to portray each pen or calculator (see Exhibit 1). Each participant saw one pair of product descriptions for each category containing either shared good attributes and unique negative attributes (unique negative condition) or unique good attributes and shared negative attributes (unique positive condition).

The pen descriptions were adopted from Sanbonmatsu et al. (1991), and the two sets of unique attributes were equal in mean desirability.¹ Brand descriptions for a hand calculator were developed to match the pen descriptions in terms of attribute valence and importance. The specific attributes for the hand calculator brands were selected using the *Consumer Reports* (1991) evaluation of the category. These attributes were then pretested to determine the proper combinations of attributes to describe two brands of calculators that meet the requisite conditions of equal desirability, equal importance, shared positive (negative) attributes, and unique negative (positive) attributes.

Pretest

A pretest was conducted to construct the four brand descriptions for the hand calculators. Pretest data were collected in a marketing class at a large midwestern university. Eighteen students, who received class credit for participating, filled out a questionnaire during the class period. First, respondents rated 24 generic attributes (e.g., programmable, price, etc.) of a hand calculator on a 10-point scale from "not at all important" to "extremely important." Next, they rated specific positive or negative attributes of a calculator (e.g., "Comprehensive programming," "Friend says it is a good value for the price," "Number pad uncomfortable") on a 10-point scale from "extremely bad" to "extremely good." These responses were evaluated to construct two pairs of hand-calculator descriptions such that the two brands were equally good with shared positive (negative) attributes and unique negative (positive) attributes.²

¹The pen stimuli were created by Sanbonmatsu et al. (1991) and were each described by nine attributes (four were negative attributes, and five were positive attributes). The two pens either had (1) shared positive and unique negative attributes or (2) shared negative and unique positive attributes. The attributes were pretested so that both options were of equal value.

²The combination of attributes selected for the two brands of calculators produced goodness and importance ratings that indicate that the two brands were perceived as equal. For example, the HHH brand and JJJ brand calculator with unique positive attributes produced goodness ratings of 54 and 53.2, respectively, and importance ratings of 55.3 and 55.9, respectively. Similarly, the HHH brand and the JJJ brand with unique negative attributes produced goodness ratings of 52.9 and 52.3, respectively, and importance ratings of 63.1 and 64.5, respectively.

EXHIBIT 1

DESCRIPTION OF STIMULI

Unique Positive

Circle Brand Pen

Does not skip
Available in a wide range of colors
Friend says it is slightly overpriced
Becomes uncomfortable with prolonged use
Refillable
Nonsmear ink
Tip breaks down with excessive pressure
Not long lasting
Friend says it has a nice feel to it

HHH Brand Calculator

Very durable
Minimal programming ability
Printer makes a lot of noise
Battery lasts a long time
Printer output is easy to read
Four-month warranty
Keys are silent when pressed
15 built-in functions
Keypad is slightly uncomfortable

Dot Brand Pen

Special grip to ensure precision and control
Tip breaks down with excessive pressure
Friend says it is slightly overpriced
Elegantly styled
Writes on a variety of surfaces
Becomes uncomfortable with prolonged use
Friend says it writes nicely
Guaranteed to write every time
Not long lasting

JJJ Brand Calculator

Automatic shut-off to preserve the battery
Minimal programming ability
Printer makes a lot of noise
Unit is small and compact
Easy to program
Four-month warranty
Printer speed is faster than most
Has many features
Keypad is slightly uncomfortable

Unique Negative

Dot Brand Pen

Friend says it is slightly overpriced
Guaranteed to write every time
Available in a wide range of colors
Not long lasting
Grip can become slippery
Refillable
Writes on a variety of surfaces
Ink smears readily
Friend says it has a nice feel to it

HHH Brand Calculator

Dependable
Does not have automatic shut-off
Five built-in functions
Easy to program
Keypad designed for rapid entry
Printer speed is slower than most
Printer output is easy to read
Display will accommodate 16 digits
Large and bulky (not portable)

Circle Brand Pen

Writes on a variety of surfaces
Tip breaks down with excessive pressure
Skips on occasion
Available in a wide range of colors
Refillable
Becomes uncomfortable with prolonged use
Guaranteed to write every time
Friend says it has a nice feel to it
Not attractively styled

JJJ Brand Calculator

Printer output is easy to read
Small memory buffer
Battery needs to be replaced often
Dependable
Easy to program
Small numbers in the display
Keypad designed for rapid entry
Display will accommodate 16 digits
Has only the basic feature

Subjects

Subjects were 317 students recruited from a subject pool at three large midwestern universities. Of those, 16 nonnative English-speaking students and three students who did not follow directions were excluded from the analysis.³ The final, usable sample consisted of 298 students. Subjects were naive to the purpose of the study, and each student received extra course credit as an incentive to participate.

³Three of the students refused to return the first booklet to the envelope and referred back to the product descriptions when answering the preference question. These students were dropped from the sample.

Independent Variables

The individual characteristic, need for cognition, was measured and the two situational variables, involvement, and valence of the unique attributes, were manipulated. The valence of the unique attributes is used to determine the magnitude of the direction-of-comparison effect. Need for cognition was measured via the 18-item scale developed by Cacioppo, Petty, and Kao (1984) to identify a person's inherent desire to engage in elaborate processing. Responses to the 18 statements (e.g., "I would prefer complex to simple problems," "Thinking is not my idea of fun" [reverse coded], etc.) were scored on a scale ranging from +4 (very strong agreement) to -4 (very

strong disagreement). As in previous studies, a median split was used to separate participants into high and low need for cognition groups based on the summed measure (e.g., Cacioppo and Petty 1982; Cacioppo et al. 1996). The resulting mean composite need for cognition scores were significantly different between the high and the low need for cognition groups ($\bar{X}_{\text{low need for cognition}} = 1.1$, $\bar{X}_{\text{high need for cognition}} = 35.6$, $p < .0001$) and the scale exhibited a high degree of reliability ($\alpha = .89$).

Two categories were used to operationalize high/low involvement, and each subject evaluated both categories. The design was counterbalanced so that each category, pens and hand calculators, was evaluated as the high (or low) involvement category by half of the subjects. The low involvement category was the first category evaluated by each subject and was described as having "no correct answer." The high involvement category was described to the subject as a "calibration" category in which the two options presented had been rated by a panel of expert judges and that they would be rewarded for accuracy (i.e., matching the panel's response) by being entered in a lottery for a cash prize. The prizes offered included a first prize of \$25, a second prize of \$10, and a third prize of \$5. It was necessary to order the questions in the questionnaire such that the high involvement category (financial incentives for accuracy) was positioned after the low involvement category (no financial incentives) to avoid possible carryover effects.

Involvement has been described to incorporate more than product class involvement (Johnson and Eagly 1989) and can be extended to include involvement with the judgment. This manipulation of involvement "links the issues to anticipated outcomes," and it creates "an explicit personal goal that one expects to obtain relatively soon, mainly by one's own efforts" (Johnson and Eagly 1989, p. 293). Moreover, the manipulation increases the likelihood that participants will be "motivated to evaluate the brands featured" (Petty and Cacioppo 1990, p. 372). The current involvement manipulation has personal relevance, control over the outcome, and the financial reward or risk that is directly related to something controllable by the subject (i.e., correctly answering the questions).

Order of presentation was counterbalanced such that half of the subjects were presented with the description of each brand first. In addition, half of the subjects saw brand pairs where the unique attributes were positive, and half saw pairs where the unique attributes were negative. The brand descriptions are presented in Exhibit 1.

Dependent Variables

The dependent variable for this experiment, preference, was measured via a relative quality measure using two semantic differential scales (i.e., one for each brand) ranging from "extremely low quality" (1) to "extremely high quality" (10). This measure is consistent with past research that has used both product perceptions (Hoch and Ha 1986) and quality difference measures (Ha and

Hoch 1989) to measure preference. In addition, by using this composite relative-quality measure, the analysis can focus on the extremity of preference rather than on a simple yes or no choice. For the present study, the preference measure was created by subtracting the reported quality for the first brand presented (i.e., the referent) from the quality reported for the second brand presented (i.e., the subject). Hence, negative values on this index indicate a preference for the referent, and positive values indicate a preference for the subject of comparison.

Procedure

Each subject was presented with a set of booklets containing descriptions of four brands (two from one category, pens, and two from another category, calculators). Each description was presented on a separate page and consisted of the brand name as well as a list of the attributes for which some attributes were shared while others were unique. For the positive unique cell, the unique attributes were positive and the shared attributes were negative; and for the negative unique cell, the unique attributes were negative and the shared attributes were positive. The preference measure was administered after the respective booklets describing the brands were removed. Finally, manipulation checks and need for cognition scales were administered.

Manipulation Checks

A manipulation check was performed by measuring the participants' level of involvement with each of the two categories via a six-item, seven-point scale similar to that used by Swinyard (1993). The bipolar adjectives included important/unimportant, relevant/irrelevant, means a lot to me/means nothing to me, valuable/worthless, matters to me/does not matter to me, undesirable/desirable. This involvement scale was reliable for both the low and the high involvement categories ($\alpha = .89$ and $\alpha = .93$, respectively). These results indicate that the financial incentive manipulation of involvement was highly effective ($\bar{X}_{\text{low involvement}} = 22.1$ vs. $\bar{X}_{\text{high involvement}} = 24.3$, $p < .0001$).

In addition, a check was performed to ensure that need for cognition was not confounded with the measured level of involvement. Neither involvement measure was significantly correlated with need for cognition scores.

The product categories (pens and calculators) were counterbalanced such that each served as the low involvement category for some subjects and the high involvement category for others. A test was conducted to determine whether the two product categories could be collapsed within each involvement condition. No main effect of product category on preference and no interactions were found (F 's < 1). Moreover, the presence of the category order variable in the MANOVA did not change the statistical relationships between the independent variables and the dependent variables. Thus, all subsequent analyses

TABLE 1

MEANS AND STANDARD DEVIATIONS: EXPERIMENT 1

	Preference	
	\bar{X}	SD
Total ($N = 298$)		
High involvement	.319	2.681
Low need for cognition:		
Positive valence	.493	2.417
Negative valence	.262	2.661
High need for cognition:		
Positive valence	.580	2.697
Negative valence	-.103	2.933
Low involvement	-.027	2.256
Low need for cognition:		
Positive valence	-.203	2.097
Negative valence	-.350	2.334
High need for cognition:		
Positive valence	.901	2.166
Negative valence	-.574	2.139

aggregate the data across categories within each level of involvement (Keppel 1982).

EXPERIMENT 1 RESULTS

Preference

Because one within-subjects factor (involvement) and two between-subjects factors (valence and need for cognition) were employed, a mixed ANOVA was performed (see Tables 1 and 2 for descriptive statistics and MANOVA results). Consistent with Hypothesis 1a, the data show that individuals who score high on the need for cognition scale are more likely to be influenced by the direction-of-comparison manipulation than are those who score low on the need for cognition scale. To show a direction-of-comparison effect, individuals who were asked to choose between objects with unique positive attributes should prefer the subject of comparison, and those who were asked to choose between objects with unique negative attributes should prefer the referent of comparison. Groups that do not exhibit a direction-of-comparison effect will show no difference in preference based on unique attribute valence. A significant interaction between need for cognition and unique attribute valence was found on preference ($F(1, 294) = 4.69$, $p = .03$, partial $\eta^2 = .015$) and a significant main effect for unique attribute valence was found ($F(1, 294) = 9.51$, $p = .001$, partial $\eta^2 = .03$), consistent with Hypothesis 1a. The significant interactive effect of need for cognition and valence on preference shows that those with high need for cognition have a systematic bias in their preference. For items with unique positive attributes, the preference is significantly greater than the no-preference point ($p = .003$) showing a preference for the subject of comparison. When considering items with unique negative attributes, the preference is significantly less than the no-

TABLE 2

MANOVA: EXPERIMENT 1

Source of variation	Preference		
	MS	F	Significance of F
Between-subjects effects:			
Constant	9.39	1.50	.22
Valence	59.47	9.51	<.001
NFC	3.36	.54	.46
Valence \times NFC	29.33	4.69	.03
Within-subjects effects:			
Involvement	19.66	3.42	.06
Valence \times involvement	4.64	.81	.36
NFC \times involvement	12.42	2.16	.14
Valence \times NFC \times involvement	7.08	1.23	.26

NOTE.—NFC = need for cognition.

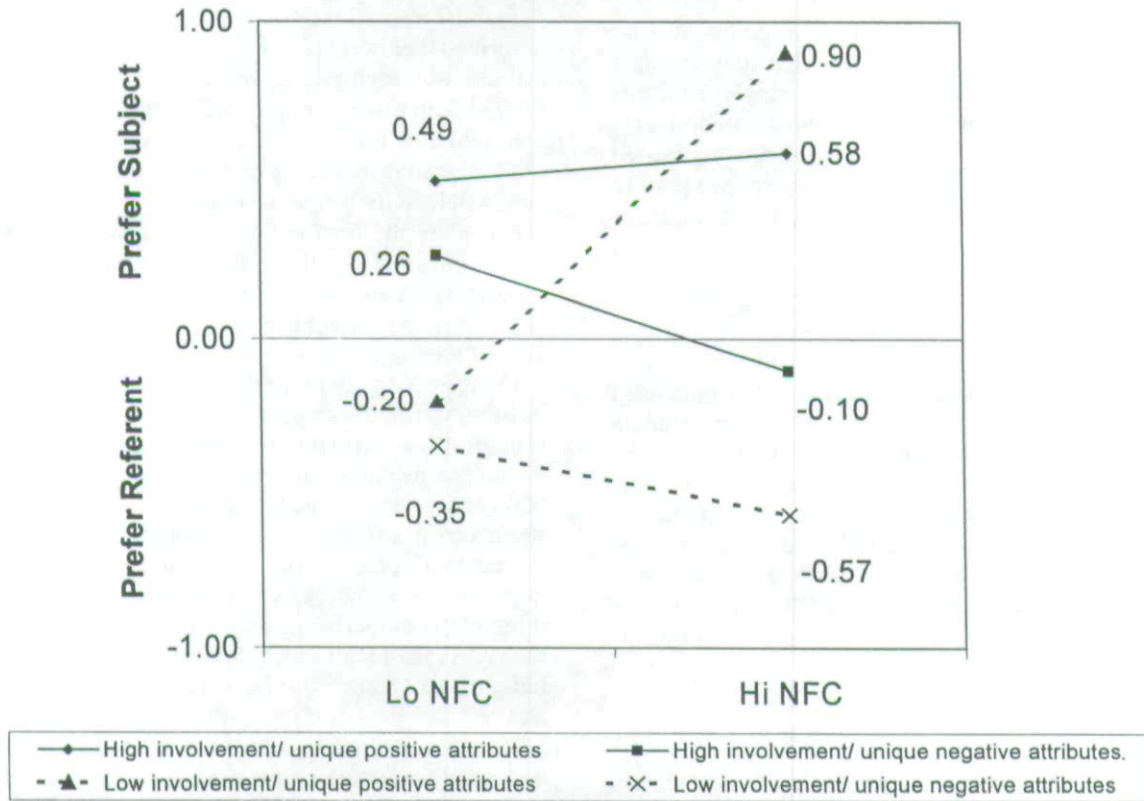
preference point ($p = .05$) showing a preference for the referent of comparison. On the contrary, low need for cognition individuals had an equal preference for both alternatives (i.e., preference scores were not significantly different from zero; $p > .2$; see Fig. 2).

The planned contrasts suggest that the involvement hypothesis, Hypothesis 2, is supported. First, among low involvement individuals, need for cognition moderates the direction-of-comparison effect (Hypothesis 2a). That is, those who scored high on the need for cognition scale exhibit a direction-of-comparison effect, while those who scored low on the need for cognition scale exhibit no such effect. Using planned contrast analysis (Rosenthal and Rosnow 1985), the preference score reported for the low involvement/high need for cognition individuals who chose between two items with unique negative attributes is significantly lower than the same category of individuals who chose between two items with unique positive attributes ($\bar{X}_{\text{low involvement, high need for cognition, unique positive}} = .901$; $\bar{X}_{\text{low involvement, high need for cognition, unique negative}} = -.574$; $t(294) = 4.16$, $p < .01$). Conversely, the preference scores reported by low involvement individuals who scored low on the need for cognition scale were not significantly different across the unique attribute valence conditions ($\bar{X}_{\text{low involvement, low need for cognition, unique positive}} = -.203$; $\bar{X}_{\text{low involvement, low need for cognition, unique negative}} = -.35$; $t < 1$; see Fig. 2).

Further, among high involvement individuals (Hypothesis 2b), the direction-of-comparison effect is nonsignificant for both low and high need for cognition groups. The planned contrast analysis showed that no cell in the high involvement condition was significantly different from any other high involvement cell (planned contrast $t(294) = 1.63$, $p = .19$).⁴

⁴When interactions involving differences between specific cells are predicted, planned comparisons should be conducted instead of evaluat-

FIGURE 2
PREFERENCE: EXPERIMENT 1



Discussion

The data provide insight into the predicted person-by-situation interaction on the preference judgment process and support the contention that person-by-situation influences are important in behavioral decision research. Specifically, it appears that individuals who are high in need for cognition are influenced by the direction-of-comparison effect, whereas those who are low in need for cognition are not influenced by this effect. The interaction between involvement and need for cognition suggests that an increased level of involvement in a judgment will in-

ing overall *F*-tests (Hays 1981; Keppel 1982; Kirk 1982). In fact, Rosenthal and Rosnow (1985) suggest that "there are relatively few circumstances under which we will want to use omnibus *F*-tests. What we will be getting in return for the small amount of computation required to employ contrasts is (a) very much greater statistical power and (b) very much greater clarity of substantive interpretation of research results" (p. 4). Nevertheless, the reader may be interested in the results of omnibus *F*-tests. The *F*-value for the main effect of involvement on the preference measure was $F(1, 294) = 3.42$ ($p = .065$, partial $\eta^2 = .012$). The *F*-values for the interactive effects that include involvement were $F(1, 294) = .81$ (N.S.), 2.16 (N.S.), and 1.23 (N.S.) for the two-way interactions (i.e., with valence and need for cognition) and the three-way interactions, respectively.

crease the motivation to produce a correct response. Therefore, for high need for cognition individuals, involvement appears to moderate the direction-of-comparison effect. It is hypothesized that individuals who "enjoy thinking" (i.e., high need for cognition individuals) use an attribute-based processing strategy in formulating preferences. Conversely, we hypothesize that the low need for cognition group uses an attitude-based processing strategy. Because attributes are not accessible at the time of judgment for this group, involvement does not affect the processing strategy or influence preference. Conversely, high need for cognition individuals, for whom the attributes are accessible at the time of judgment, may be motivated to consider more attributes under conditions of high involvement. The planned contrasts show a significant direction-of-comparison effect for high need for cognition individuals under low involvement conditions but a nonsignificant effect under high involvement conditions. The inference that can be drawn from these planned comparisons is that the involvement manipulation may motivate the individual to increase consideration of all information that is accessible at the time of judgment, but may not motivate increased accessibility of the attributes. This inference will be tested in experiment 2.

EXPERIMENT 2

Overview

Experiment 2 replicates and extends experiment 1 by investigating the processing strategies that may mediate the interactions identified. Experiment 2 employed a different measure of preference to permit the use of converging operations. In addition, attribute recall was measured to investigate its influence as a mediator, and a measure of the thought process used (i.e., analytic vs. intuitive processing) was included. A $2 \times 2 \times 2$ mixed factorial design was employed.

Subjects

The sample for this study was similar to that used in experiment 1. Two hundred forty-four undergraduate students were recruited from a subject pool at two large midwestern universities. Subjects were naive to the purpose of the study and received extra course credit for participation. All of the subjects followed the directions; however, 12 subjects declined to indicate a product preference on at least one of the preference questions. Therefore, analyses using these questions were run on the remaining 232 subjects.

Stimuli, Procedure, and Independent Variables

The brand descriptions for all brands in both categories and all experimental procedures used are identical to those in experiment 1. Also, the same independent variables were used (i.e., the individual characteristic, need for cognition, and the two situational variables, involvement and valence of the unique attributes). All manipulation checks and pooling tests were conducted just as described in experiment 1 and indicated that all subsequent analyses could be aggregated across categories within each of the high and low involvement classifications (Keppel 1982).

Dependent Measures

A converging operations approach was used by employing a new preference measure on a scale from "strongly prefer the [referent] brand" (1) to "strongly prefer the [subject] brand" (12). A line was drawn between points 6 and 7 on the scale, and each half of the scale was clearly marked as to which brand was being chosen. A low score on this forced-choice measure indicates a preference for the referent, and a high score indicates a preference for the subject of comparison.

In order to determine which attributes were accessible during preference formation, attribute recall was assessed for each brand. The order of brand attribute recall was counterbalanced such that each brand was assessed first within its category for half of the participants and the other brand was assessed first for the remaining participants. Two judges coded these open-ended responses independently. An attribute received a one if it was recalled

and a zero if it was not recalled. Ninety-six percent of the coded responses matched between the two judges and discrepancies were resolved via discussion.

Finally, a recall index was calculated using the equation described below. This recall index was constructed to capture the asymmetric recall described by Tversky's (1977) feature-matching model within a single index that could then be used as a mediator. Specifically, Tversky's (1977) feature-matching model suggests that a respondent will heavily weigh the unique attributes of the subject and neglect the unique attributes of the referent. Asymmetric attribute recall should mediate preference for the subject in the unique positive condition and mediate preference for the referent in the unique negative condition. The following index was employed: $RI = (PA_S - PA_R) + (NA_R - NA_S)$, where RI = recall index, PA_S = percent positive attributes recalled from the subject, PA_R = percent positive attributes recalled from the referent, NA_R = percent negative attributes recalled from the referent, and NA_S = percent negative attributes recalled from the subject. A positive score on this index indicates asymmetric attribute recall favoring the subject of comparison. A negative score indicates asymmetric recall favoring the referent of comparison. A score of zero indicates no asymmetry. As the recall index deviates from zero, the magnitude of the direction-of-comparison effect should increase.

Relative attribute recall is important in investigating the underlying thought process used: however, this measure is simply a count of attributes recalled from the stimuli. In order to ascertain the relative worth of the items recalled, and thus the usefulness of those items, subjects were asked to rate each recalled item on the "importance to [their] decision." This importance of recall has been shown to affect the relationship between recall and attitude (Chattopadhyay and Alba 1988). Subjects were asked to turn back to the page on which they listed the attributes and place a number next to each item. The four-point scale ranged from "very important to my decision" to "very unimportant to my decision." These rankings were recoded such that "very important" attributes were assigned a rating of 4, "very unimportant" attributes were assigned a rating of 1, and attributes not explicitly rated were excluded from the analysis. Fewer than 4 percent of recalled attributes were left unrated.

A six-item measure of analytic versus intuitive processing was also developed: "The answer just came to me" (reverse coded); "In making my decision, I focused more on my personal impressions and feelings rather than on complex tradeoffs between attributes" (reverse coded); "I tried to use as much attribute information as possible"; "I carefully compared the two brands on several different attributes"; "My decision was based on facts rather than on general impressions and feelings"; "My decision was based on careful thinking and reasoning." Each statement was rated on a six-point scale ranging from "strongly disagree" (1) to "strongly agree" (6). The scale was validated using confirmatory factor

TABLE 3
MEANS AND STANDARD DEVIATIONS: EXPERIMENT 2

	Preference		Relative recall		Analytic/intuitive thought	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Total (N = 298)						
High involvement	6.10	2.73	-.0023	.4809	43.9	13.2
Low need for cognition:						
Positive valence	6.62	2.63	.0206	.3898	39.3	12.7
Negative valence	5.77	2.95	-.0150	.3489	45.3	13.0
High need for cognition:						
Positive valence	7.00	2.73	.2717	.4588	45.5	13.3
Negative valence	5.25	2.39	-.2110	.5535	45.7	13.1
Low involvement	6.37	2.92	-.0100	.4750	39.5	12.9
Low need for cognition:						
Positive valence	6.65	2.46	.0302	.4777	35.0	12.0
Negative valence	6.28	2.40	-.0320	.4712	40.2	12.3
High need for cognition:						
Positive valence	8.00	3.92	.2660	.4163	40.2	13.9
Negative valence	4.94	3.02	-.2301	.4075	42.4	12.4

analysis performed via LISREL 8.12 (GFI = .98, AGFI = .95, RMSR = .065; $\chi^2 = 11.10$, $df = 9$, $p = .27$; Cronbach's $\alpha = .75$).

To ensure that the analytic/intuitive processing construct measures a different underlying dimension than need for cognition, discriminant validity was assessed (Peter 1981). To do this, two methods were employed. First, both factor structures were evaluated via LISREL 8.12 using a model with two latent variables (i.e., analytic/intuitive thought and need for cognition). The two latent variables are not significantly correlated ($\Phi = .10$, N.S.). Second, the average variance extracted (AVE) method was used (Fornell and Larcker 1981). Both analytic/intuitive processing and need for cognition show a greater variance captured by the construct than captured by measurement error as shown by the AVE (.34 and .13, respectively) being greater than the squared structural link between the two constructs ($\Phi^2 = .01$). Therefore, the constructs are empirically distinct. This discriminant validity is confirmed using the confidence interval procedure (Gerbing and Anderson 1988) showing a high likelihood that two distinct constructs are measured.

EXPERIMENT 2 RESULTS

Moderating Influence of Need for Cognition

A mixed ANOVA with one within-subjects factor (involvement) and two between-subjects factors (valence and need for cognition) was performed on preference judgments. The data replicate the results found in experiment 1 and support the hypothesis that preference is moderated by need for cognition. (See Tables 3 and 4 for MANOVA results.) As suggested by Hypothesis 1a, individuals who score high on the need for cognition scale were more likely to be influenced by direction of compar-

son than were those who scored lower. That is, high need for cognition individuals preferred the subject of comparison when the decision was between two brands with unique positive attributes ($\bar{X}_{\text{high need for cognition, unique positive}} = 7.0$ and 8.0 for high and low involvement groups, respectively) and the referent of comparison when the decision was between two brands with unique negative attributes ($\bar{X}_{\text{high need for cognition, unique negative}} = 5.3$ and 4.9 for high and low involvement groups, respectively). The means were significantly different ($p < .001$) for both high and low involvement groups (see Fig. 3). Low need for cognition individuals did not report a significant difference in preference ($\bar{X}_{\text{low need for cognition, unique positive}} = 6.6$ and 6.7 , $\bar{X}_{\text{low need for cognition, unique negative}} = 5.8$ and 6.3 for high and low involvement, respectively; $p > .14$). The significant interactive effect of need for cognition with valence on preference ($F(1, 227) = 11.038$, $p < .001$, partial $\eta^2 = .046$) was consistent with Hypothesis 1a and suggests that need for cognition did indeed moderate the direction-of-comparison effect.

Also, the significant three-way interaction between involvement, need for cognition, and unique attribute valence ($F(1, 227) = 3.763$, $p = .05$, partial $\eta^2 = .02$) supported Hypothesis 2. Among low involvement individuals, the direction-of-comparison effect was not evident for the low need for cognition group but was evident for the high need for cognition group. The planned contrast analysis (Rosenthal and Rosnow 1985) showed that the low need for cognition (low involvement) group reported preference scores that were not significantly different from each other ($t < 1$) and not significantly different from the no-preference point (i.e., a value of 6.5; see Fig. 3). The high need for cognition (low involvement) group, in contrast, reported preference scores that were both significantly different from each other ($t = -5.53$, $p < .001$) and significantly different from the no-preference point ($p < .001$).

TABLE 4
MANOVA: EXPERIMENT 2

Source of variation	DV = Preference			DV = Relative recall			DV = Preference (recall controlled)		
	MS	F	Significance of F	MS	F	Significance of F	MS	F	Significance of F
Between-subjects effects:									
Constant	1,812.60	2,223.00	<.001	.075	.32	.57	17,910.6	3,304.11	<.001
NFC	.20	.03	.87	.065	.27	.60	1.33	.25	.620
Valence	254.91	31.17	<.001	8.700	36.91	<.001	32.93	6.08	.014
Valence × NFC	90.27	11.04	<.001	5.800	24.70	<.001	1.74	.32	.572
Recall (low involvement)							188.92	34.85	<.001
Recall (low involvement)							333.35	61.50	<.001
Within-subjects effects:									
Involvement	11.48	1.81	.18	.0075	.05	.83	12.24	2.12	.147
NFC × involvement	.24	.04	.84	.0024	.02	.90	.22	.04	.845
Valence × involvement	5.48	.86	.35	.0116	.07	.79	.01	.01	.970
Valence × NFC × involvement	23.87	3.76	.05	.0011	.01	.93	7.68	1.22	.270
Involvement × recall (low involvement)							135.16	23.38	<.001
Involvement × recall (high involvement)							17.21	2.98	.086

NOTE.—NFC = need for cognition; DV = dependent variable.

FIGURE 3
PREFERENCE: EXPERIMENT 2

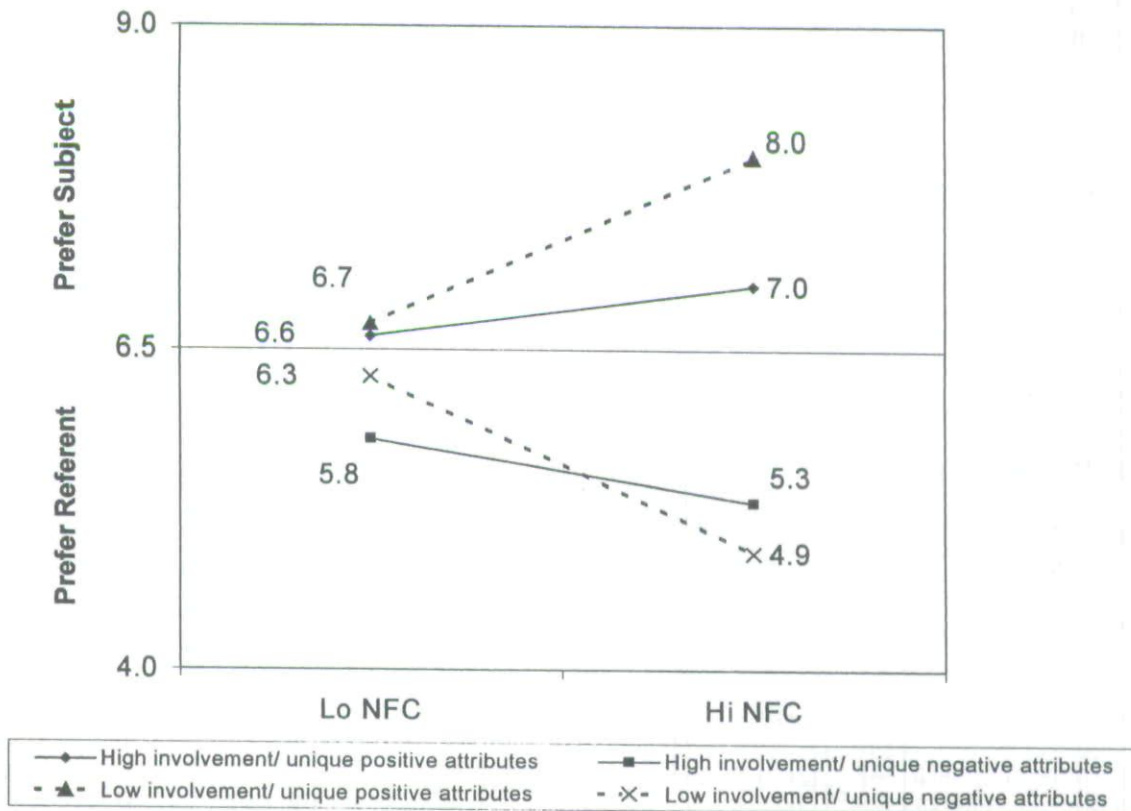
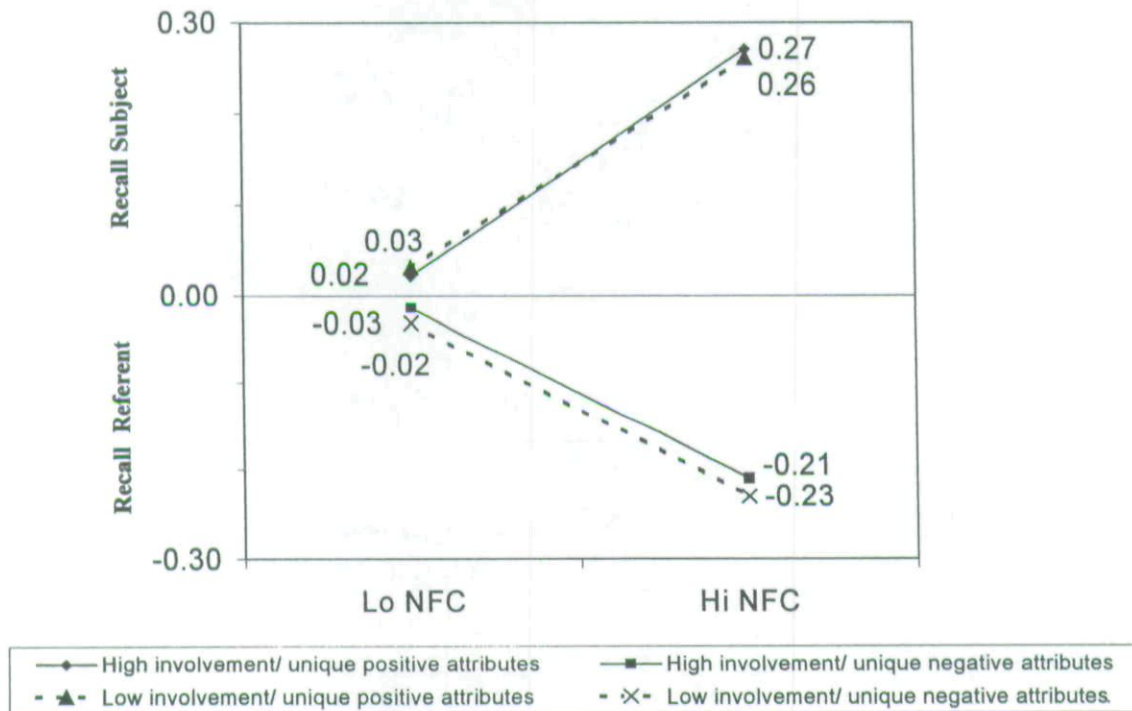


FIGURE 4
RELATIVE RECALL: EXPERIMENT 2



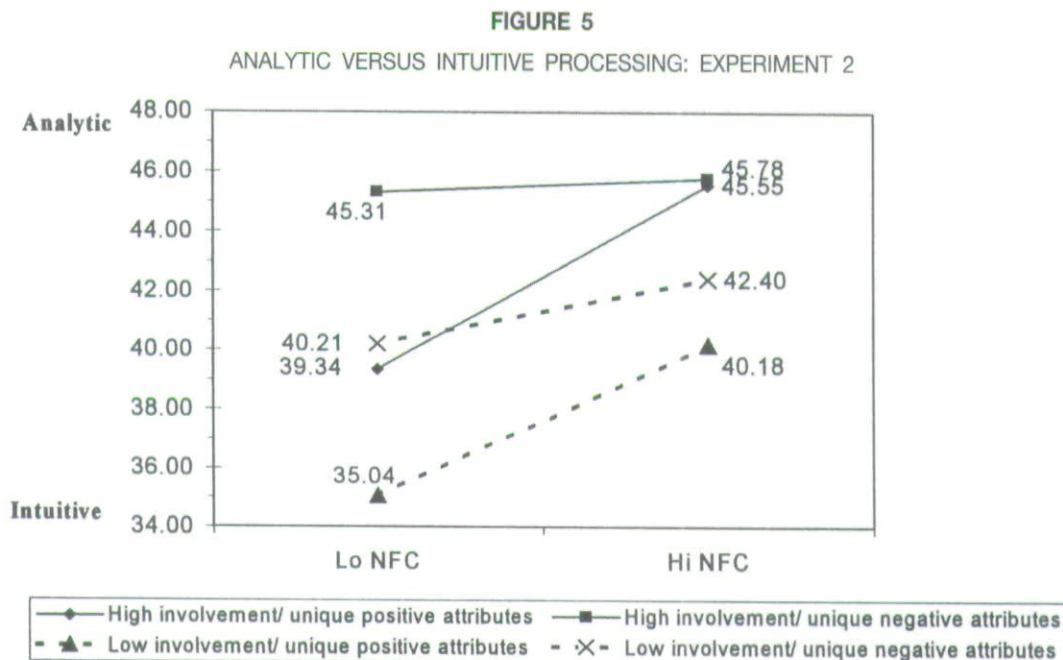
Although the direction-of-comparison effect was still evident among high involvement/high need for cognition individuals, the effect was not as strong as in the low involvement cell. The planned contrasts indicated that although the preference responses were significantly different for positive unique attribute condition ($\bar{X} = 7.0$) and negative unique attribute condition ($\bar{X} = 5.3$; $t = 3.61, p < .001$), the preference response for the positive unique attribute condition ($\bar{X} = 7.0$) was not significantly different from the no-preference point ($t = 1.203, p = .24$, compared to 6.5). These results suggest a weaker direction-of-comparison effect and are consistent with both experiment 1 and Hypothesis 2.

Test for Mediation

Baron and Kenny's (1986) framework for combining mediation and moderation was used to test Hypothesis 1b. First, as shown in the previous section, the interaction of the independent variables, need for cognition and unique attribute valence, significantly influence the dependent variable, preference. The mediator (recall index) is significantly affected by the interaction ($F(1, 240) = 24.69, p < .001$; see Fig. 4, Table 4). Also, the mediator significantly affects preference, in both low ($F(1, 225) = 34.852, p < .0001$) and high ($F(1, 225) = 61.495, p < .0001$) involvement groups. Finally, the previously significant interaction becomes nonsignificant when the recall index is included as a covariate ($p = .57$).

Additional mediational analyses were performed on recall for common attributes and recall for unique attributes separately. The results show that asymmetric recall for unique attributes (but not for common attributes) mediates the effect of the need for cognition \times unique attribute valence interaction on preference. Specifically, two new indices were calculated to capture the common attribute recall (CI) and the unique attribute recall (UI). For the unique positive attribute condition the unique recall index measured the relative recall of positive attributes and common recall index measured the relative recall of negative attributes. For the unique negative condition, the indices were reversed. Next, Baron and Kenny's (1986) mediation analysis was repeated for each new subindex. For the unique recall index, the interaction (between need for cognition and unique attribute valence) affects the mediator ($p < .001$). Then, when the original MANOVA is run with the unique attribute recall as a covariate, the unique attribute recall significantly ($p < .001$) affects preference, and the two-way interaction becomes nonsignificant ($p = .19$). Thus unique recall mediates the effect. Conversely, the common recall index does not show mediation because, when the original MANOVA is run with the common index as the covariate, the two-way interaction remains significant ($p = .008$). Thus, asymmetric attribute recall (specifically unique attribute recall) mediates the interactive influence of need for cognition and unique attribute valence on preference.

The hypotheses state that the involvement interaction



with need for cognition and unique attribute valence is driven by a difference in extent of processing rather than asymmetry in processing. According to Baron and Kenny (1986), for recall to be a mediator of the involvement \times need for cognition \times valence three-way interaction on preference, recall must show a similar significant relationship to the moderating variables. This is not the case. Not only is the three-way interaction nonsignificant ($F < 1$), all main effects and interactions including involvement are nonsignificant (F 's < 1).

Second, the analytic/intuitive processing scale is tested against the hypotheses. As expected, participants indicated that they engaged in higher levels of analytic thinking in high (vs. low) involvement ($F(1, 240) = 47.307$, $p < .0001$, $\eta^2 = .20$) and unique negative (vs. positive) attribute conditions ($F(1, 240) = 4.9$, $p = .02$, $\eta^2 = .02$). Also, high (vs. low) need for cognition individuals indicated a higher level of analytic thought ($F(1, 240) = 5.3$, $p = .022$, $\eta^2 = .02$). See Figure 5 and Table 5.

The three-way interaction on preference was tested while controlling for analytic/intuitive processing. The analytic/intuitive thought associated with the high involvement judgment is significantly related to preference ($F(1, 225) = 4.172$, $p = .04$), but the analytic/intuitive thought associated with the low involvement judgment is nonsignificant ($F(1, 225) = 2.078$, $p = .15$). At the same time, the three-way interaction significance level changes to .08. Further, there are no other main or interactive effects of involvement. The valence main effect and the interaction between unique attribute valence and need for cognition remain significant ($F(1, 225) = 31$, $p < .0001$, partial $\eta^2 = .13$; $F(1, 225) = 9.76$, $p = .002$, partial $\eta^2 = .04$, respectively). This suggests

that the three-way interaction is partially mediated by analytic/intuitive thought for the high involvement decision.

To further investigate the underlying processing differences between high and low need for cognition subjects, the average importance of the recalled attributes was investigated along with the absolute level of recall. Those subjects who were using attribute-based processing (i.e., high need for cognition subjects) should have recalled a relatively greater number of important attributes, and those subjects who were using attitude-based processing (i.e., low need for cognition subjects) should have recalled fewer and less important attributes. In order to test this, two planned t -tests were employed. The percentage of attributes recalled and the average importance of those attributes were tested between high and low need for cognition groups. The data showed that low (vs. high) need for cognition subjects recalled significantly fewer attributes ($\bar{X}_{\text{low need for cognition}} = 37$ percent, $\bar{X}_{\text{high need for cognition}} = 53$ percent, $p < .001$) overall, and low need for cognition subjects assigned a significantly lower average importance rating to each of the recalled attributes ($\bar{X}_{\text{low need for cognition}} = 2.6$ and $\bar{X}_{\text{high need for cognition}} = 2.8$, $p = .05$). These patterns of recall are consistent for both the high and low involvement categories. We can infer from this that while the low need for cognition subjects can recall some attributes when explicitly asked to do so, the attributes recalled are relatively few and not particularly important to the judgment. Conversely, high need for cognition subjects recalled significantly more attributes that were considered important to the preference judgment.

Finally, in order to engage in attribute-by-attribute comparisons, comparable attributes from both brands

TABLE 5
MANOVA: EXPERIMENT 2

Source of variation	DV = Analytic/Intuitive Thought			DV = Preference (analytic/intuitive thought controlled)		
	MS	F	Significance of F	MS	F	Significance of F
Between-subjects effects:						
Constant	836,292.0	3,015.0	<.001	1,167.700	144.150	<.001
NFC	1,469.8	5.3	.02	251.407	31.036	<.001
Valence	1,384.8	4.9	.02	.310	.038	.845
Valence × NFC	567.1	2.1	.15	79.083	9.763	.002
Analytic/intuitive (low involvement)				16.830	2.078	.157
Analytic/intuitive (high involvement)				33.794	4.172	.042
Within-subjects effects:						
Involvement	2,470.6	47.3	<.001	4.816	.760	.384
NFC × involvement	3.3	.6	.80	7.179	1.133	.285
Valence × involvement	10.5	.2	.65	.002	.003	.957
Valence × NFC × involvement	58.1	1.1	.29	19.148	3.024	.083
Involvement × analytic/intuitive (low)				.858	.135	.713
Involvement × analytic/intuitive (high)				11.362	1.794	.182

NOTE.—NFC = need for cognition; DV = dependent variable.

must be accessible at the time the judgment is made. Therefore, high (vs. low) need for cognition subjects should be more likely to recall common attributes to both brands because common attributes are directly comparable on an attribute-by-attribute basis. As expected, for the low and high involvement categories, respectively, 62 percent and 79 percent of high need for cognition subjects recalled more than two common attributes (out of four or five possible) for both brands under consideration. This pattern is reversed for low need for cognition subjects, where 67 percent and 52 percent recalled one or fewer common attributes for both brands. This pattern is significantly different ($\chi^2 = 20.32$, $p < .001$; $\chi^2 = 25.62$, $p < .001$) in both involvement categories.

Discussion

Asymmetric recall for unique attributes mediates the effect of direction of comparison on preference. The differences in processing strategy across need for cognition groups may cause the direction-of-comparison effect to shape preference among high need for cognition individuals using an attribute-based processing strategy without influencing preference among low need for cognition individuals using an attitude-based processing strategy. Although this mediation hypothesis has been suggested in the past, the direct test of asymmetric recall as the mediator provides evidence for the hypothesized underlying process. Thus, decision makers who exhibit the direction-of-comparison effect are more likely to recall (and thus consider) the unique (vs. shared) attributes of the subject and neglect the unique attributes of the referent. When the unique attributes are positive, these unique attributes of the subject of comparison are weighted heavily, and,

consequently, the subject is preferred. Conversely, when the unique attributes are negative, these negative attributes are weighted more heavily, and the referent is preferred.

Further, an increased level of involvement appears to increase motivation to process (i.e., increased analytic thought) without increasing the accessibility of attributes under consideration (i.e., recall). This increased motivation minimizes the direction-of-comparison bias among high need for cognition individuals while having no influence on the reported attribute recall. Thus, the higher level of analytic thought by high (vs. low) involvement individuals may be the impetus for reduction in direction-of-comparison bias among high need for cognition individuals. Although the data appear to confirm a similar involvement effect among low need for cognition subjects (i.e., increased motivation with no change in attitude-based processing), the lack of change in observed preference makes the testing of this finding difficult at best. Because we do not expect a change in preference among this group (i.e., we expect the null hypothesis to be supported), we are focusing our evaluation on the process indicators and the differences between high and low need for cognition groups. The relatively low level of recall and the low importance attached to that recall suggests that the low (vs. high) need for cognition group is using the one or two attributes recalled as a heuristic cue during the judgment process and thus they are probably engaging in attitude-based processing. In future research, this issue could be more fully evaluated if a specific measure of attitude-based processing is included in addition to the attribute-based processing indicator (i.e., recall). With this one caveat, these data appear to confirm the theory that those who have the attributes accessible at the time

preference is expressed can be motivated to better use those attributes; however, if the personality type is such that the decision maker is prone to attitude-based processing, the extra motivation of a high involvement task does not influence preference.

IMPLICATIONS AND CONTRIBUTION

Evidence from two experiments suggests that memory-based judgments can be influenced by attitude- or attribute-based processing strategies depending on the person-by-situation influences that are operative. Both experiments support the hypothesis that persons who are high in need for cognition are more likely to use attribute-based processing and be influenced by the direction-of-comparison effect whereas those who are low in need for cognition are not. It also appears this difference between individuals is mediated by asymmetric recall for unique attributes. The analyses executed in both experiments suggest that involvement in the judgment, which is induced by a concern about accuracy, increases effort but has little effect on the ability to use an attribute-based (vs. attitude-based) judgment strategy. Consequently, low need for cognition individuals (i.e., those who did not have the attributes accessible in memory during the judgment task) were not affected by the involvement manipulation. These results suggest that need for accuracy may motivate the individual to increase consideration of all accessible information but may not increase the likelihood that more information will be accessible.

Acknowledging the interplay between the person and the situation is requisite to understanding human behavior (see, e.g., Bem and Allen 1974; Lewin 1951; Mischel 1968; and Punj and Stewart 1983). In fact, some evidence suggests that although cognitive styles do not vary across situations, people who have different cognitive styles will interpret (and respond to) the situations differently (Bem and Allen 1974). Recent research in this area has shown that person-by-situation interactions not only produce obviously different behaviors (Haugtvedt et al. 1992), but also may influence the long-term behaviors even when the immediate responses appear to be similar across groups (Haugtvedt and Petty 1992). Thus, person-by-situation interactions will account for more of the interesting variance in behavior than either person or situation effects alone, and it is only by considering these interactions that we can fully make sense of past findings and advance consumer decision research (Bagozzi 1993).

With knowledge about when the direction-of-comparison effect is likely (i.e., when an attribute-based processing strategy is used), the marketer may decide to discourage attribute-based processing by encouraging attitude-based processing when his or her brand is unlikely to be the focus of comparison. That is, the brand manager could design the marketing campaign to stress the image of the product and encourage the consumer to consider the big picture rather than focusing on the individual attributes within the advertisements. Conversely, the marketer

may try to encourage attribute-based processing even among the low need for cognition individuals by specifically requesting an attribute-based judgment (i.e., "even if you never remember details, remember these"). This may be effective if the brand is likely to be the focus of comparison.

Further, the marketer may be able to influence a brand's position as the focal object in a preference decision by various techniques. Being the first major brand in a new category (i.e., pioneering advantage), obtaining a prominent position on the retail shelf, or achieving a large share of voice in the advertising schedule are all likely to make the brand the focus of comparison for many consumers. It seems reasonable to assume that a prominent shelf position would be more effective in becoming the focus of comparison among the low need for cognition individuals whereas a large share of voice would be more effective for the high need for cognition group. The direction-of-comparison effect appears to be asymmetrical in that the high need for cognition individuals are influenced by it but the low need for cognition individuals are not. Therefore, the marketer should choose a strategy that is most likely to make the brand the focus of comparison for the high need for cognition group.

Further, manufacturers should consider the relative superiority of their brands before embarking on an increased involvement strategy. It appears that involvement only motivates more analytic thought and consideration of the information available when preferences are generated rather than directly influencing the direction-of-comparison effect among all consumers. For this reason, marketers may want to influence the involvement associated with the decision (e.g., "You don't buy a car very often, make sure you've made the best choice") only if the brand is clearly superior to other brands under close scrutiny.

This work fills a gap in the current literature because there is a need for research to explore the interaction between personal characteristics and situational variables that may moderate decision biases. The two studies reported above offer the marketer potentially valuable insights into consumer decision making and the moderating roles of need for cognition and involvement on the direction-of-comparison effect.

The present research raises an important caveat in the current research and theory on the key factors that influence the level of bias and error that is likely to creep into human judgment. Individuals high (vs. low) in need for cognition are more likely to engage in effortful, data-driven, attribute-based information processing, and less likely to engage in heuristic, theory driven, attitude-based processing. Although effortful processing can decrease the level of judgment bias and error observed in many cases (see, e.g., Arkes 1991; Cacioppo et al. 1996), the present research shows that effortful, attribute-based processing can actually increase bias when directional comparison processes give prominence to the unique attributes of one brand and decrease attention to the unique attributes of a less focal brand. The asymmetric treatment of the unique features

of two competing brands and the direction-of-comparison effect in consumer preference is less likely to be observed when effortful, attribute-based comparisons are unlikely to be performed. Effort carries no guarantee of accuracy: the relationship between effort and accuracy depends on the interaction between the nature of the information used as a basis for judgment and the manner of cognitive operations performed on this information.

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REFERENCES

- Alba, Joseph W. and J. Wesley Hutchinson (1987), "Dimensions of Consumer Expertise," *Journal of Consumer Research*, 13 (March), 411-454.
- , J. Wesley Hutchinson, and John G. Lynch (1991), "Memory and Decision Making," in *Handbook of Consumer Behavior*, ed. Thomas S. Robertson and Harold H. Kassarian, Englewood Cliffs, NJ: Prentice-Hall, 1-49.
- Arkes, Hal R. (1991), "Costs and Benefits of Judgment Errors: Implications for Debiasing," *Psychological Bulletin*, 110 (November), 486-498.
- Bagozzi, Richard P. (1993), "ACR Fellow Address," paper presented at the Association for Consumer Research Annual Conference, Nashville.
- Baron, Reuben M., and David Kenny (1986), "The Moderator-Mediator Distinction in Social Psychology Research: Conceptual, Strategic, and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (December), 1173-1182.
- Bem, Daryl J. and Andrea Allen (1974), "On Predicting Some of the People Some of the Time: The Search for Cross-Situational Consistencies in Behavior," *Psychological Review*, 81 (November), 506-520.
- Cacioppo, John T. and Richard E. Petty (1982), "The Need for Cognition," *Journal of Personality and Social Psychology*, 42 (January), 116-131.
- , Richard E. Petty, Jeffrey A. Feinstein, and W. Blair G. Jarvis (1996), "Dispositional Differences in Cognitive Motivation: The Life and Times of Individuals Varying in Need for Cognition," *Psychological Bulletin*, 119 (March), 197-253.
- , Richard E. Petty, and Chuan Kao (1984), "The Efficient Assessment of Need for Cognition," *Journal of Personality Assessment*, 48 (June), 306-307.
- , Richard E. Petty, and Katherine J. Morris (1983), "Effects of Need for Cognition on Message Evaluation, Recall, and Persuasion," *Journal of Personality and Social Psychology*, 45 (October), 805-818.
- Celsi, Richard L. and Jerry C. Olson (1988), "The Role of Involvement in Attention and Comprehension Processes," *Journal of Consumer Research*, 15 (September), 210-224.
- Chaiken, Shelly and Durairaj Maheswaran (1994), "Heuristic Processing Can Bias Systematic Processing: Effects of Source Credibility, Argument Ambiguity, and Task Importance on Attitude Judgment," *Journal of Personality and Social Psychology*, 66 (March), 460-473.
- Chattopadhyay, Amitava and Joseph W. Alba (1988), "The Situational Importance of Recall and Inference in Consumer Decision Making," *Journal of Consumer Research*, 15 (June), 1-12.
- Consumer Reports (1991), "Printing Calculators," *Consumer Reports* (August), 527-531.
- Dhar, Ravi and Itamar Simonson (1992), "The Effect of the Focus of Comparison on Consumer Preferences," *Journal of Marketing Research*, 29 (November), 430-440.
- Fiske, Susan T. and Steven L. Neuberg (1990), "A Continuum of Impression Formation, from Category-Based to Individualizing Processes: Influences of Information and Motivation on Attention and Interpretation," in *Advances in Experimental Social Psychology*, Vol. 23, ed. Mark P. Zanna, New York: Academic Press, 1-74.
- Fornell, Claes and David F. Larcker (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, 18 (February), 39-50.
- Gerbing, David W. and James C. Anderson (1988), "An Updated Paradigm for Scale Development Incorporating Unidimensionality and Its Assessment," *Journal of Marketing Research*, 25 (May), 186-192.
- Ha, Young-Won and Stephen J. Hoch (1989), "Ambiguity, Processing Strategy, and Advertising-Evidence Interactions," *Journal of Consumer Research*, 16 (December), 354-360.
- Hastie, Reid and Bernadette Park (1986), "The Relationship between Memory and Judgment Depends on Whether the Judgment Task Is Memory-Based or On-Line," *Psychological Review*, 93 (July), 258-268.
- Haugtvedt, Curtis P. and Richard E. Petty (1992), "Personality and Persuasion: Need for Cognition Moderates the Persistence and Resistance of Attitude Changes," *Journal of Personality and Social Psychology*, 63 (August), 308-319.
- , Richard E. Petty, and John T. Cacioppo (1992), "Need for Cognition and Advertising: Understanding the Role of Personality Variables in Consumer Behavior," *Journal of Consumer Psychology*, 1 (3), 239-260.
- and Duane T. Wegener (1994), "Message Order Effects in Persuasion: An Attitude Strength Perspective," *Journal of Consumer Research*, 21 (June), 205-218.
- , Duane T. Wegener, and Wendy L. Warren (1994), "Personal Relevance, Attack Source Expertise, and Resistance of Newly Changed Attitudes," paper presented at the annual meeting of the Midwestern Psychological Association, Chicago.
- Hays, William L. (1981), *Statistics*, New York: Holt, Rinehart, & Winston.
- Hoch, Stephen J. and Young-Won Ha (1986), "Consumer Learning: Advertising and the Ambiguity of Product Experience," *Journal of Consumer Research*, 13 (September), 221-233.
- Houston, David A. and Steven J. Sherman (1995), "Cancellation and Focus: The Role of Shared and Unique Features in the Choice Process," *Journal of Experimental Social Psychology*, 31 (July), 357-378.
- , Steven J. Sherman, and Sara M. Baker (1989), "The Influence of Unique Features and Direction of Comparison on Preferences," *Journal of Experimental Social Psychology*, 25 (March), 121-141.
- , Steven J. Sherman, and Sara M. Baker (1991), "Feature Matching, Unique Features, and the Dynamics of the Choice Process: Pre-Decision Conflict and Post-Decision Satisfaction," *Journal of Experimental Social Psychology*, 27 (September), 411-430.

- Hutchinson, J. Wesley and Joseph W. Alba (1991), "Ignoring Irrelevant Information: Situational Determinants of Consumer Learning," *Journal of Consumer Research*, 18 (December), 325-345.
- Inman, J. Jeffrey, Leigh McAlister, and Wayne D. Hoyer (1990), "Promotion Signal: Proxy for a Price Cut?" *Journal of Consumer Research*, 17 (June), 74-81.
- Johnson, Blair T. and Alice H. Eagly (1989), "Effects of Involvement on Persuasion: A Meta-analysis," *Psychological Bulletin*, 106 (September), 290-314.
- Kardes, Frank R. (1986), "Effects of Initial Product Judgments on Subsequent Memory-Based Judgments," *Journal of Consumer Research*, 13 (June), 1-11.
- and David M. Sanbonmatsu (1993), "Direction of Comparison, Expected Feature Correlation, and the Set-Size Effect in Preference Judgment," *Journal of Consumer Psychology*, 2 (1), 39-54.
- Keppel, Geoffrey (1982), *Design and Analysis: A Researcher's Handbook*, 2d ed., Englewood Cliffs, NJ: Prentice-Hall.
- Kirk, Roger E. (1982), *Experimental Design: Procedures for the Behavioral Sciences*, Monterey, CA: Brooks/Cole.
- Kruglanski, Arie W. (1989), *Lay Epistemics and Human Knowledge: Cognitive and Motivational Bases*, New York: Plenum Press.
- and Tallie Freund (1983), "The Freezing and Unfreezing of Lay-Inferences: Effects on Impression Primacy, Ethnic Stereotyping, and Numerical Anchoring," *Journal of Experimental Social Psychology*, 19 (September), 448-468.
- Lewin, Kurt (1951), *Field Theory in Social Science*, New York: Harper.
- Lynch, John G., Jr., Howard Marmorstein, and Michael F. Weigold (1988), "Choices from Sets including Remembered Brands: Use of Recalled Attributes and Prior Overall Evaluations," *Journal of Consumer Research*, 15 (September), 169-184.
- and Thomas K. Srull (1982), "Memory and Attentional Factors in Consumer Choice: Concepts and Research Methods," *Journal of Consumer Research*, 9 (June), 18-37.
- Maheswaran, Duraitaj, Diane M. Mackie, and Shelly Chaiken (1992), "Brand Name as a Heuristic Cue: The Effects of Task Importance and Expectancy Confirmation on Consumer Judgments," *Journal of Consumer Psychology*, 1 (4), 317-336.
- Mischel, Walter (1968), *Personality and Assessment*, New York: Wiley.
- Nowlis, Stephen M. and Itamar Simonson (1997), "Attribute-Task Compatibility as a Determinant of Consumer Preference Reversals," *Journal of Marketing Research*, 34 (May), 205-218.
- Peter, J. Paul (1981), "Construct Validity: A Review of Basic Issues and Marketing Practices," *Journal of Marketing Research*, 18 (May), 133-145.
- Petty, Richard E. and John T. Cacioppo (1986), *Communication and Persuasion: Central and Peripheral Routes to Attitude Change*, New York: Springer.
- and John T. Cacioppo (1990), "Involvement and Persuasion: Tradition versus Integration," *Psychological Bulletin*, 107 (May), 367-374.
- , John T. Cacioppo, and David Schumann (1983), "Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement," *Journal of Consumer Research*, 10 (September), 135-146.
- , Curtis P. Haugtvedt, and Stephen M. Smith (1995), "Elaboration as a Determinant of Attitude Strength: Creating Attitudes That Are Persistent, Resistant, and Predictive of Behavior," in *Attitude Strength: Antecedents and Consequences*, ed. Richard E. Petty and Jon A. Krosnick, Mahwah, NJ: Erlbaum, 93-130.
- Punj, Girish N. and David W. Stewart (1983), "An Interaction Framework of Consumer Decision Making," *Journal of Consumer Research*, 10 (September), 181-196.
- Ratneshwar, S. and Shelly Chaiken (1991), "Comprehension's Role in Persuasion: The Case of Its Moderating Effect on the Persuasive Impact of Source Cues," *Journal of Consumer Research*, 18 (June), 52-62.
- Richins, Marsha L. and Peter H. Bloch (1986), "After the New Wears Off: The Temporal Context of Product Involvement," *Journal of Consumer Research*, 13 (September), 280-285.
- , Peter H. Bloch, and Edward F. McQuarrie (1992), "How Enduring and Situational Involvement Combine to Create Involvement Responses," *Journal of Consumer Psychology*, 1 (2), 143-153.
- Rosenthal, Robert and Ralph L. Rosnow (1985), *Contrast Analysis: Focused Comparisons in the Analysis of Variance*, New York, Cambridge University Press.
- Sanbonmatsu, David M. and Russell H. Fazio (1990), "The Role of Attitudes in Memory-Based Decision Making," *Journal of Personality and Social Psychology*, 59 (October), 614-622.
- , Frank R. Kardes, and Bryan D. Gibson (1991), "The Role of Attribute Knowledge and Overall Evaluations in Comparative Judgment," *Organizational Behavior and Human Decision Processes*, 48 (February), 131-146.
- Srull, Thomas K., Meryl Lichtenstein, and Myron Rothbart (1985), "Associative Storage and Retrieval Processes in Person Memory," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 11 (April), 316-345.
- Sujan, Mita (1985), "Consumer Knowledge: Effects on Evaluation Strategies Mediating Consumer Judgments," *Journal of Consumer Research*, 12 (June), 31-46.
- Swinyard, William (1993), "The Effect of Mood, Involvement, and Quality of Store Experience on Shopping Intentions," *Journal of Consumer Research*, 20 (September), 271-280.
- Tversky, Amos (1977), "Features of Similarity," *Psychological Review*, 84 (July), 327-352.
- Wyer, Robert S. and Thomas K. Srull (1989), *Memory and Cognition in Its Social Context*, Hillsdale, NJ: Erlbaum.
- Zaichkowsky, Judith Lynne (1985), "Measuring the Involvement Construct," *Journal of Consumer Research*, 12 (December), 341-352.
- Zhang, Yong (1996), "Responses to Humorous Advertising: The Moderating Effect of Need for Cognition," *Journal of Advertising*, 25 (Spring), 15-32.

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