

The Effects of Advertisement Variation and Need for Cognition on Attitudes toward Products

Stephen C. Nettelhorst
California State University, Northridge

Robert J. Youmans
George Mason University

Consumers are often exposed to advertisement variations—several similar advertisements about the same product or service over time. This study tested whether participants' initial attitudes about a product changed as cosmetic or substantive features of the advertisement were modified, and whether or not the effect of these modifications depended on participants' need for cognition, which is the intrinsic motivation to process information. Three hundred nineteen undergraduate students answered questions designed to measure their need for cognition, viewed an initial advertisement for a fictitious electric automobile, and then rated the product. Two days later, the same participants viewed a different version of the advertisement for the automobile in which either cosmetic or substantive features had been changed, and then rated the product again. The results of the study revealed that attitude changes about the automobile were greatest when participants with low need for cognition were exposed to advertisements with cosmetic variations. The results suggest that changing initial public attitudes about an ongoing series of advertisements, public service announcements, or other media might be made most effective by making changes to those features that correspond to the intended audience's estimated need for cognition.

Keywords: need for cognition, advertisement variation, persuasion, attitude change

One of the most challenging business decisions that companies must make to achieve success is deciding how to market a product. There are few straightforward and reliable means for estimating rates of return on marketing expenses (Rossi & Allenby, 2003; Rust, Lemon, & Zeithaml, 2004), and expenditures of capital related to marketing often cannot be recovered when a company has already made large investments towards a campaign (Pindyck, 1991). Although difficult to make, marketing decisions also directly affect the chances for a product's success (Kivetz & Simonson, 2000). With as many as half of all products that are brought to market failing each year (Sivadas & Dwyer, 2000), marketers are under intense pressure to maximize the chances of an advertising message reaching the widest possible audience. To do so, marketers often turn to producing different advertisements for a single product around a central theme, a technique called *advertisement variation* (Haugtvedt, Schumann, Schneider, & Warren, 1994; Schumann & Clemons, 1989; Schumann, Petty, & Clemons, 1990).

Advertisement variation is thought to be effective because it prevents consumers from losing interest in product marketing (Axelrod, 1980; Greenberg & Suttoni, 1973), and because advertising campaigns with variation have been shown to be more memorable and more persuasive to audiences than equal exposure to repetition of the same advertisement (Burnkrant & Unnava, 1987; Gorn & Goldberg, 1980; Grass & Wallace, 1969; McCullough & Ostrom, 1974; Unnava & Burnkrant, 1991). With most product lines, advertisement variation can be achieved in two principle ways: *substantive* changes can be made in the factual information that the messages contain, and *cosmetic* changes unrelated to content can be made (Schumann et al., 1990). The long-running commercials advertising Apple Inc.'s line of mobile consumer products are particularly good examples of advertisement variation, because they demonstrate both methods of variation. For example, Apple marketers make substantive

changes when the advertisements feature different downloadable "apps," and they make cosmetic changes when the advertisements feature different popular musicians.

In any given advertising campaign, both substantive and cosmetic information can be altered, but the impact of these changes has been found to depend in part on the characteristics of the audience. For example, Schumann et al. (1990) found that substantive changes result in more positive attitudes when an audience's motivation to learn about the product is high, while cosmetic variations result in more positive attitudes when an audience's motivation is low. This message-audience link is part of a broader model of attitude change called the *Elaboration Likelihood Model* (ELM) (Petty & Briñol, 2012; Petty & Cacioppo, 1986; Petty, Rucker, Bizer, & Cacioppo, 2004; Petty & Wegener, 1999).

The Elaboration Likelihood Model

The basic assumption of the ELM is that all people process information in advertisements by mentally "elaborating" on the information it contains (Petty & Cacioppo, 1986). This elaboration occurs through a combination of *central* and *peripheral* processing. As defined by Petty and Cacioppo (1986), central processing is conceptualized as an inclination toward a product based on its merits and often results from thorough evaluation of testimonials offered in its support. Peripheral processing, however, consists of one's preference for a product due to superficial characteristics rather than a close examination of the product's merit. An advertisement focusing on central processing would attempt to persuade someone to purchase a product by demonstrating the product's functions and utility. In contrast, an advertisement focusing on peripheral processing would attempt to persuade someone to purchase a product by highlighting the cosmetic appearance of the product or hiring an attractive model to endorse it. According to proponents of the ELM, both the

environment in which an advertisement is processed and personality differences between people can bias processing by motivating people to spend more time thinking about either the substantive or cosmetic features of an advertisement. For example, cosmetic changes such as the occupation of the product endorser have been shown to affect how persuasive a message is for individuals who are engaged in peripheral processing (Haugtvedt et al., 1994; Schumann et al., 1990). Conversely, substantive changes like the introduction of new product characteristics in an advertisement affect how persuasive a message is when individuals are engaged in central processing (Haugtvedt et al., 1994; Schumann et al., 1990).

Some proponents of the ELM assume that every individual has a personality trait called the *need for cognition*—a person's intrinsic motivation to process information—which naturally differs between individuals (Cacioppo & Petty, 1982). A person's need for cognition biases his or her tendency to use central processing versus peripheral processing when thinking about stimuli. Cacioppo and Petty (1982) developed the Need for Cognition Scale to measure how people tend to process messages, and to predict individuals' processing biases. In general, people who tend to process stimuli using central processing are known as *high need for cognition* (HNC) individuals while people who tend to utilize peripheral processing are known as *low need for cognition* (LNC) individuals.

Research has shown that it is possible to make predictions about how a message will be centrally or peripherally processed using the Need for Cognition Scale. Studies have demonstrated that HNC individuals had more positive attitudes about an issue after a message used strong arguments to advocate its position, but the attitudes of LNC individuals did not differ based on the quality of the argument (Cacioppo, Petty, Kao, & Rodriguez, 1986; Cacioppo, Petty, & Morris, 1983). Haugtvedt, Petty, and Cacioppo (1992) generalized these findings by theorizing that LNC individuals typically base their attitudes more on peripheral factors like the attractiveness of a product's endorser, while HNC individuals do not. For example, Zhang and Buda (1999) reported that LNC individuals are influenced by the framing of the advertisement, and Putrevu (2008) found that LNC individuals prefer sexually provocative advertisements while HNC individuals prefer non-provocative advertisements.

When individuals' memory of persuasive message content was tested, HNC individuals were able to recall more information relevant to the topic than LNC individuals (Cacioppo et al., 1986; Cacioppo et al., 1983). Haugtvedt et al. (1994) found that participants exposed to substantive advertisement variations had significantly higher recall of the product's characteristics after a one-week delay than participants exposed to cosmetic advertisement variations regardless of their need for cognition. The authors also found improved recall for participants exposed to substantive variations when compared to participants exposed to the same advertisement multiple times and participants exposed to the advertisement once. Further, Schumann et al. (1990) showed that individuals with low motivation in a cosmetic variation condition had better recall of an advertisement's cosmetic features than those with high motivation. Taken together, these findings may suggest that consumers' processing bias toward certain details about a past

advertisement can moderate the ability of new advertisements to change attitudes.

Predicting Interactions between Variation Type and Need for Cognition

The research reported here investigated how substantive and cosmetic advertisement variations affected people's initially negative evaluations of products. The goal was to test whether attitudes about a product could be improved more effectively when cosmetic or substantive advertisement variations were matched to the target audience's need for cognition. To do so, the authors created a series of advertisements for a fictitious electric automobile, the first of which was deliberately mediocre. Participants viewed the advertisement and rated the product, and then returned two days later to view a variation on that initial advertisement. Thus the focus of this study was to assess the degree to which attitudes about the product improved from the initial advertisement to the varied advertisement. This improvement was assessed in this study by using time as a within-participant variable. Given that individuals both high and low in need for cognition were exposed to the same advertisement initially, we do not expect any differences in attitudes for the initial advertisement. However, the authors do expect individuals' need for cognition to moderate the difference between substantive and cosmetic advertisement variations on attitudes for the second advertisement. Based on past research, the authors reasoned that if cosmetic improvements were made to the second advertisement, these changes would be most effective for increasing the product ratings for lower need for cognition individuals, and that if substantive improvements were made to the second advertisement, these changes would increase product ratings for higher need for cognition individuals.

Method

Participants

Three-hundred nineteen undergraduate psychology students from a university in the western United States were recruited through the use of a psychology department's participant pool and were compensated for their participation with course credit. Although demographic information was not collected for participants in this study, demographic information for the entire participant pool indicated that a majority of participants (66%) were females, and that over 97% of participants were between the ages of 18 to 25 years. Participants identified themselves as Hispanic (37%), Asian-American (10%), African-American (11%), Caucasian (30%), Pacific Islander (3%), Native American (0.24%), and Other (9%). Participants indicated their informed consent to participate and were debriefed as specified by the university's Internal Review Board that approved the study.

Design

This study was a mixed-participant quasi-experimental design. The first independent variable was the participants' need for cognition, high or low. The second independent variable was the type of advertisement variation, cosmetic or substantive. The authors had no experimental control over any given participant's need for cognition, but participants were randomly assigned

ADVERTISEMENT VARIATION

to view advertisements with either cosmetic or substantive advertisement variations. In addition to using need for cognition and advertisement variation as between-group variables, the date of advertisement exposure was used as a within-participant variable. The dependent variable was participants' attitudes toward the target product after the second advertisement exposure.

Materials

On the first and third days of the experiment, participants watched one of two slide presentations. Each presentation contained a series of storyboards about a hypothetical television show with an embedded advertisement for an electric automobile in the middle of the hypothetical show. The storyboards were intended to make participants believe the cover story, that the purpose of the experiment was to rate the show. The use of storyboards before and after the advertisement also made the materials more similar to how people experience television commercials and online advertising by embedding the advertisement within other media.

The first advertisement was deliberately constructed to elicit negative attitudes about a fictitious electric automobile by displaying cosmetic and substantive features that were intentionally mediocre. For example, one cosmetic feature of the first advertisement was the use of an endorser who was rated as unpopular by students in a pilot survey. In that survey, ten celebrities were pilot tested to assess their popularity. Popularity was measured using a 7-point Likert item asking participants to rate how much they like or dislike each celebrity. Endpoints for the items were *extremely dislike* and *extremely like*, with higher values representing more favorable popularity. A paired samples t-test revealed a significant difference between the unpopular celebrity ($M = 3.19$, $SD = 6.13$) and the popular celebrity ($M = 6.13$, $SD = 0.92$) used in this study, $t(30) = 11.77$, $p < .001$. Examples of the mediocre substantive features from the first advertisement include electronic vehicle recharge times of 8-10 hours and an operational range of between 45-60 miles. Previous research has confirmed that these substantive features are well below what consumers typically require before they would form positive attitudes about electric vehicles because consumers compare those figures with the quick refueling times and 300-mile range of conventional gasoline-powered vehicles (Ewing & Sarigollu, 2000).

Because the initial automotive advertisement contained both cosmetic and substantive features, the authors could manipulate whether cosmetic or substantive variations were made to the subsequent varied advertisement. For example, in the cosmetic variation condition, the second advertisement featured the same substantive facts about the automobile, but the authors switched the product endorser from the unpopular celebrity to one that had been rated as more positive. In contrast, the substantive variation condition improved the range of the vehicle from the 45 - 60 mile range provided in the first advertisement to a range of 200 - 275 miles, but kept the unpopular endorser constant. This type of substantive manipulation is comparable to the methodology used in multiple marketing studies that manipulate the quality of an advertisement or message (Haugtvedt et al., 1992; Priester & Petty, 2003). Participants in this study were randomly assigned to be in either the substantive or cosmetic variation condition by randomly drawing red or black playing cards from a shuffled deck without replacement.

Measures

Need for Cognition Scale (Cacioppo, Petty, & Kao, 1984).

The shortened version of the Need for Cognition Scale, utilized in the present study, works by asking participants to read a list of 18 different descriptions of thinking behavior, for example, "I would prefer complex to simple problems." After reading each description, participants rate how characteristic that statement is of their preferences for thinking. For a full description of the Need for Cognition Scale, see Cacioppo et al. (1984). An extensive review by Cacioppo, Petty, Feinstein, and Jarvis (1996) also discusses the reliability, factor structure, and validity of the Need for Cognition Scale as a measurement tool. The findings in their review showed that the scale itself provides a one factor structure with a Cronbach reliability coefficient typically above .85. For this study, an internal consistency analysis showed that the Need for Cognition Scale was a reliable measure of the construct (Cronbach's $\alpha = .85$). In addition, the scale was shown to converge with other measures of intrinsic motivation and cognitive absorption while diverging from measures of affect, extraversion, and loneliness (Cacioppo et al., 1996). Finally, Cacioppo et al. (1996) demonstrated that the scale was a significant predictor of various activities which required cognitive effort.

Author-developed participant attitude measure.

Participants' attitudes about the automobile were measured by asking them to rate how much they agreed or disagreed with a list of 10 descriptive adjectives about the automobile that included: *Good, Awful, Exceptional, Bad, Terrible, Excellent, Dreadful, Outstanding, Superb, and Horrible*. Agreement for each adjective was measured using a 7-point Likert item where *strongly agree* was used as the high anchor, and *strongly disagree* was used as the low anchor. Scores were calculated by averaging participants' scores for the 10 adjectives after scores for the negatively worded adjectives were reversed. Using this method, the maximum positive attitude rating for the car was 7 while the minimum was 1. Internal consistency values for time 1 (Cronbach's $\alpha = .95$) and for time 2 (Cronbach's $\alpha = .96$) showed that the attitudinal scale was reliable.

Procedure

After giving their consent to participate, all participants completed the Need for Cognition Scale (Cacioppo et al., 1984) and then watched a 6-minute slide presentation containing storyboards of an episode of a television show and the first 45-second advertisement for a fictitious electric automobile. The laboratory allowed for up to four participants to be tested simultaneously, however, each participant was tested at an independent workstation that was separated from the others by room dividers. After the presentation, each participant rated the automobile using the attitude survey. Immediately following the attitude survey, participants were dismissed and asked to return for a second session two days later.

During the second session, participants watched a new 6-minute PowerPoint presentation with storyboards of a new episode of the same show and a new 45-second advertisement of the same automobile featuring either cosmetic or substantive advertisement variations. Half of the participants were randomly assigned to the substantive variation condition where the advertisement featured the same celebrity endorser and different performance information

about the automobile. The other half of the participants were randomly assigned to the cosmetic variation condition where the advertisement featured a more popular celebrity endorser but with the same performance information about the automobile. After watching the second slide presentation, participants again rated the automobile using the same attitude survey used two days earlier. Finally, participants were thanked for participation, debriefed about the purpose of the study, and excused.

Results

Attrition

From an initial sample size of 319 participants, 32 did not return to participate in the second session. Therefore, out of caution the researchers began the data analysis by investigating whether the drop-out participants significantly differed from the participants who completed the study in need for cognition and attitude scores from time 1, but no reliable differences between the two populations were found for need for cognition scores, $t(317) = 0.24, p > .05$, or for attitudes towards the product for time 1, $t(50.09) = 0.97, p > .05$. There was no evidence of differences between these groups on measured variables which might have confounded these results. Therefore data for the remaining 287 participants were checked for statistical normality.

Data Checking

Additional analyses were conducted to test the data for univariate outliers and for variable skewness (Tabachnick & Fidell, 2007). Due to the use of grouped data, all analyses were performed for each of the four conditions (HNC-substantive variation, LNC-substantive variation, HNC-cosmetic variation, and LNC-cosmetic variation). To determine participants' need for cognition group, participants were identified as LNC or HNC by using a median split procedure. Participants who scored in the top 50% range were labeled as HNC while participants who scored in the bottom 50% range were labeled as LNC (Haugtvedt et al., 1994; Nan, 2009; Schumann et al., 1990). The median need for cognition score was 62, so participants who scored 62 and above were labeled as HNC and those who scored below 62 were labeled as LNC. After conditions were formed, eight participants were

removed because they had missing data for some of the need for cognition or attitude measures. After removal of these participants, standardized scores for the remaining participants were calculated for need for cognition, time 1 attitude, and time 2 attitude variables. Participants' scores for these variables were less than 3.29 standard deviations away from the mean so no univariate outliers were identified (Tabachnick & Fidell, 2007). Variable skewness was then checked for each of the four groups.

Across all four groups, only the time 2 attitude variable for the low need for cognition-cosmetic variation group indicated negative skewness. Further inspection showed that three participants had standardized scores ($z = 3.26$) close to the outlier cutoff. As a result, these three participants were removed from further analyses to correct the skewness instead of transforming the variable for all four groups. The remaining participants ($n = 276$) were used for the subsequent analyses.

Three-way Mixed Factorial ANOVA

A 2 x 2 x 2 mixed factorial ANOVA was conducted with need for cognition (high or low), advertisement variation type (substantive or cosmetic), and time (time 1 and time 2) as factors with attitude toward the product as the dependent variable. Need for cognition and advertisement variation were both between-participant variables with two levels each while time was a within-participant variable with two levels. The purpose of this study was to assess the possible relationship between advertisement variation and need for cognition for the second advertisement specifically. Thus, the principal effect under examination was the three-way interaction between advertisement variation, need for cognition, and time. All other main effects and interactions are reported in Table 1 and will not be examined further. In addition, descriptive statistics for each condition are reported in Table 2. Results from the mixed ANOVA showed a significant three-way interaction between time, need for cognition, and advertisement variation on attitude scores, $F(1, 272) = 5.80, p = .017, \eta^2 p = .021$, indicating moderation effects of need for cognition on the relationship between advertisement variation and attitude toward the product. To probe this interaction further, two univariate ANOVAs were conducted assessing the interaction between advertisement variation and need for cognition for time 1 and time 2 scores separately using Bonferroni corrections to prevent inflation of familywise error rates.

Table 1
Inferential Statistics of Three-way ANOVA

Effect	$F(1, 272)$	p	$\eta^2 p$
Advertisement Variation	0.14	.711	.001
Need for Cognition	11.80	.001	.042
Time	25.58	< .001	.086
Advertisement Variation x Need for Cognition	5.44	.020	.020
Advertisement Variation x Time	5.04	.026	.018
Need for Cognition x Time	0.36	.549	.001

ADVERTISEMENT VARIATION

Table 2
Descriptive Statistics of Three-way ANOVA

Time	Advertisement Variation	Need for Cognition	<i>M</i>	<i>SD</i>
1	Substantive	High	4.45	1.62
		Low	4.82	1.24
		Average	4.63	1.45
	Cosmetic	High	4.38	1.59
		Low	5.09	1.06
		Average	4.70	1.41
	Collapsed	High	4.41	1.60
		Low	4.94	1.16
		Average	4.67 ^a	1.43
2	Substantive	High	5.16	1.22
		Low	5.11	0.98
		Average	5.14	1.10
	Cosmetic	High	4.45 ^c	1.68
		Low	5.41 ^d	0.91
		Average	4.89	1.46
	Collapsed	High	4.80	1.51
		Low	5.25	0.96
		Average	5.02 ^b	1.29

Note: ^aMean < ^bMean and ^cMean < ^dMean at $p < .05$.

T1 ANOVA

With Bonferroni corrections in place, the factorial ANOVA for time 1 attitude scores showed a significant main effect for need for cognition, $F(1, 272) = 10.06, p < .002, \eta_p^2 = .036$, with attitudes scores significantly higher for LNC participants ($M = 4.94, SD = 1.16$) than HNC participants ($M = 4.41, SD = 1.60$). The main effect for advertisement variation, however, was not significant, $F(1, 272) = 0.36, p = .548, \eta_p^2 = .001$, indicating similar attitude scores for the substantive ($M = 4.63, SD = 1.45$) and cosmetic ($M = 4.70, SD = 1.41$) variation conditions. The interaction between advertisement variation and need for cognition was also not significant, $F(1, 272) = 1.01, p = .317, \eta_p^2 = .004$, showing no moderation effect of need for cognition on the relationship between advertisement variation and attitudes towards the product at time 1 (see Figure 1).

T2 ANOVA

Time 2 results, like the time 1 findings, showed a significant main effect for need for cognition, $F(1, 272) = 9.16, p = .003, \eta_p^2 = .033$, with attitude scores significantly higher for LNC participants ($M = 5.25, SD = 0.96$) than HNC participants ($M = 4.80, SD = 1.51$). The main effect of advertisement variation was again not

significant for time 2, $F(1, 272) = 1.94, p = .165, \eta_p^2 = .007$, indicating similar attitude scores for substantive ($M = 5.13, SD = 1.10$) and cosmetic ($M = 4.89, SD = 1.46$) advertisement variation conditions. However unlike time 1, there was a significant interaction between advertisement variation and need for cognition on attitude scores for time 2, $F(1, 272) = 11.24, p = .001, \eta_p^2 = .040$. This interaction was further probed by examining simple effects assessing the relationship between need for cognition and attitudes toward the product for the substantive and cosmetic advertisement variation conditions separately.

The simple effect for substantive advertisement variation showed no significant effect of need for cognition on attitudes toward the product, $F(1, 140) = 0.07, p = .791, \eta_p^2 = .001$, indicating similar attitudes scores for LNC participants ($M = 5.11, SD = 0.98$) and HNC participants ($M = 5.16, SD = 1.22$). The simple effect for cosmetic advertisement variation, however, showed a significant effect of need for cognition on attitudes toward the product, $F(1, 132) = 16.01, p < .001, \eta_p^2 = .108$. Group comparisons on this effect showed that LNC participants ($M = 5.41, SD = 0.91$) had significantly higher attitudes toward the product than HNC participants ($M = 4.45, SD = 1.68$) (see Figure 2).

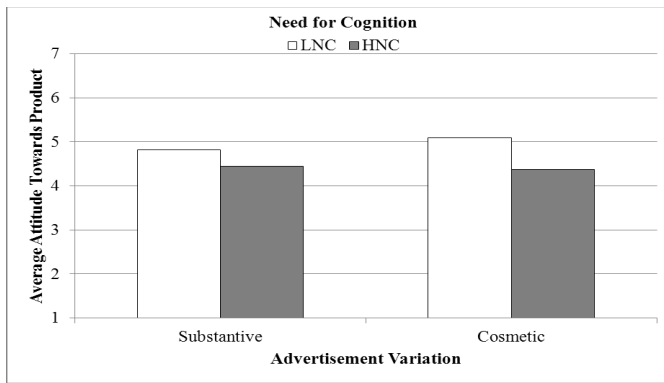


Figure 1. Attitudes about the electric car split by condition and by NFC at time 1.

Discussion

We predicted that cosmetic improvements to a previously rated negative advertisement would improve the attitudes of people with low need for cognition more than people with high need for cognition, and that substantive improvements to an advertisement would improve the attitudes of people with high need for cognition more than people with low need for cognition. The analyses of this study revealed support for the first hypothesis: LNC participants' attitudes were significantly higher than HNC participants' in the cosmetic advertisement variation condition. However, the second hypothesis, that substantive changes to the product would improve the attitudes of people with HNC more than those with LNC, was not supported. The opinions of HNC participants about the product did not improve more than LNC participants following the substantive product improvements.

The pattern of results reported here has important implications for those who seek to use cosmetic or substantive advertisement variations to change attitudes. First, the significant change in attitude that we detected in LNC participants came by way of a relatively simple manipulation: replacing an unpopular spokesperson with one who is more popular. Researchers have long known that spokespeople can alter people's perceptions of products, particularly when the spokesperson is well matched to the characteristics of that product (Lynch & Schuler, 1994). Thus, marketers might be tempted to make cosmetic variations to advertisements by varying who is used as a spokesperson in the hopes of improving consumer attitudes when an advertising campaign has gotten off to a poor start. However, given that replacing a spokesperson in an ongoing advertisement variation campaign could be costly, the authors caution advertisers to carefully consider what type of an audience is being targeted before deciding to make such a change. Hiring a popular spokesperson to replace one who is less popular might be an effective way of improving attitudes about a product, but as this study demonstrated, this is only true when the need for cognition of the target audience is low.

Unlike past studies in which substantive qualities of a product were shown to affect consumer attitudes, the current study suggests that substantive advertisement variations failed

to improve the attitudes of people with HNC. But an important distinction between the current work and previous research concerns how substantive variations were achieved in the advertising medium. For example, Haugtvedt et al. (1994) and Schumann et al. (1990) both created substantive variations by calling participants' attention to different substantive features of an *unchanged* product, but in this study, substantive variations were achieved by advertising *actual improvements* to the same product features that had initially been advertised. The authors chose to do so in order to test whether established attitudes about a product would change as actual improvements to a product were introduced, but the differences between the two manipulations qualify some of the comparisons that can be made between our finding and past research. For example, the findings are in keeping with Schumann et al. (1990), who found that cosmetic variations had larger effects on individuals who were the equivalent to the LNC individuals in this study, but the authors did not reliably replicate their findings that substantive variations would have a greater effect on people with HNC. The purpose of highlighting these differences is not to suggest that either the current work or past studies are inaccurate, but rather, that the differences in methods between these experiments and others may account for different patterns of results.

Limitations and Future Research

Few studies that attempt to study real-world behavior in a laboratory are flawless, and the study reported here is no exception. Two related issues that the authors faced in designing this study were deciding how negative to make the substantive and cosmetic features used in the first advertisement, and on the basis of that decision, how to best ensure that the participants *perceived* those features as negative. Even though the authors took steps to pilot the negative cosmetic features, and even though the authors utilized substantive features that the participants were likely to interpret as insufficient for an electric vehicle, the participants still rated the electric vehicle featured in the first ad as slightly better than average. It is unclear why these participants did not think more negatively of the vehicle featured in the first advertisement, but one possibility is that the 45 seconds during which the advertisement was displayed was either too short (i.e., participants did not have sufficient time to think about the different cosmetic and substantive features of the advertisement) or too long (i.e., participants' attention wandered). In either case, the duration time of the advertisement might have played a part in dampening negative attitudes about the advertisement. Thankfully, this had little effect on the results of the study, but other scientists who are seeking to create initially negative attitudes about a product may wish to consider carefully how best to achieve this effect if this is a critical manipulation to their study.

One puzzling question that remains for future research to address stems from the finding that once HNC participants had created an initial attitude about the electric automobile, even real improvements—for example to the car's price and range—failed to change their attitudes about the product. If this null result is representative of the underlying phenomenon, an obvious question for marketers becomes what then, if anything, can be done to change the attitudes of people with HNC once they are established?

ADVERTISEMENT VARIATION

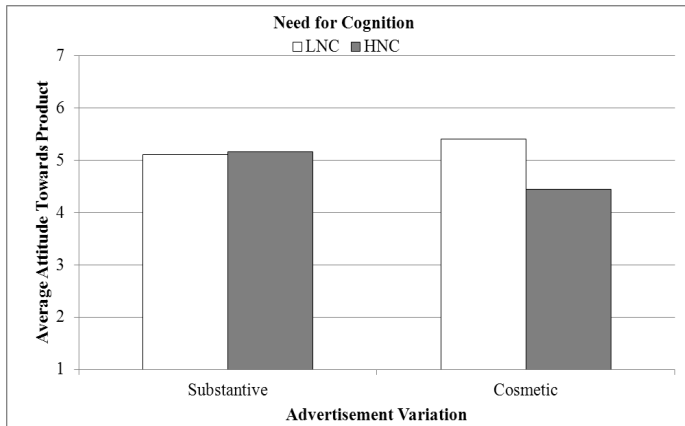


Figure 2. Attitudes about the electric car split by condition and by NFC at time 2.

The authors speculate that in cases where product perceptions are poor but unwarranted, or in cases where major improvements have been made to an existing product, exposing individuals to the product itself may facilitate central processing of the kind most often associated with HNC individuals because perceptions become based on actual interactions with the product (Ehrenberg, 1974). Although this technique is not practical for all types of persuasive messages (e.g., public service messages about drug use), proponents of the Awareness, Trial, Reinforcement Model (ATR) suggest that advertisements are persuasive only before an individual actually tries a product, after which opinions about the product quickly become based on an individual's personal experiences and interactions with that product. Therefore, marketing that aims to give people some period of experience utilizing a product may be an especially effective technique when initial marketing has been negative or when a company releases new products with real improvements because the interactions mimic the processing associated with HNC individuals. Conversely, an organization that has recently made substantive improvements to a product that has a negative reputation might be wise to skip a costly advertisement opportunity, for example, during the Super Bowl, when environmental distractions are likely to be high and central processing low.

Additional research will ultimately also be required to address many questions about how differences in product types and customer knowledge of those products affect interactions between need for cognition and advertisement variation. Given the lack of changes observed in attitudes about the electric car for HNC participants in the substantive variation condition, it could be that prior knowledge about a product is necessary before substantive variations have large effects on HNC populations. The authors note that, at the time of this study, electric automobiles were still a relatively new technology, and therefore the substantive advertisement variations we made highlighting substantive improvements to the product may have had little effect because the participants simply did not perceive these changes as positively as intended. Future researchers will also very likely be interested in better understanding whether need for cognition is determined genetically, by the environment, or by both. Recent research suggests that individual differences in preference for other types

of behaviors, for example, preferences for sweet taste, have been linked to genetic traits (Ventura & Mennella, 2011). Presumably, individual differences in mental preferences might also be linked to genetic traits, although understanding how genetic differences influence cognition is beyond the scope of this paper.

The original premise of this article suggested that marketing organizations might be able to better utilize different types of advertisement variation if the average need for cognition can be estimated. An obvious potential limitation that then arises from this approach is the following: can organizations reliably estimate personality characteristics like their target audience's need for cognition? The authors concede that administering Cacioppo and Petty's (1982) Need for Cognition Scale to an entire target audience might be impractical or impossible in many advertising domains, but there may be many situations in which an organization might make reasonable estimates about an audience's need for cognition without such assessments. In the corporate world, the work by Kumar, Petersen, and Leone (2007) showed that companies can predict customers' personalities with respect to how likely they are to make purchases and positive referrals on the basis of their past behavior. Further, people who have a LNC tend to be less politically active (Bizer, Krosnick, Petty, Rucker, & Wheeler, 2000), less sensitive to price cuts (Inman, McAlister, & Hoyer, 1990), less satisfied with their lives (Coutinho & Woolery, 2004), more likely to support punitive responses to crime (Sargent, 2004), and more likely to watch television (Henning & Vorderer, 2001). To the extent that one or more of these qualities is known, a marketer may be able to make some good estimates about the need for cognition of their target audience. For example, an executive who is marketing a politically themed magazine might predict that the magazine's audience is likely to be HNC on the basis of the product's content being read versus watched on a television, and on the basis of its subject matter. Conversely, the length of an advertisement (Ratneshwar & Chaiken, 1991) and the level of distractions surrounding an advertisement (Petty, Wells, & Brock, 1976) can influence people to peripherally process, thereby artificially creating temporary states of behavior that may be similar to those found in people with LNC.

Finally, while the authors have suggested several potential methods that corporations might employ to estimate the need for cognition in a target audience, the authors note that there are potentially other, less profit driven, motivations for estimating a population's need for cognition. Recently, work by Human Factors psychologists has highlighted the need to sometimes change people's initially negative attitudes towards the use of safety equipment, decision making aids, or automated warning systems (e.g., Parasuraman & Riley, 1997), changes that might be made more effectively if people's need for cognition were known. Likewise, in workplace settings, it may become more common to estimate, or simply periodically measure, employee's need for cognition to maximize the effectiveness of on-the-job training. Estimating an audience's need for cognition might also have potential public policy, healthcare, political, and educational applications with respect to adjusting educational initiatives, public service messages, or political campaigns that have been poorly received by the public, but that are nonetheless important to pursue.

References

- Axelrod, J. N. (1980). Advertising wearout. *Journal of Advertising Research*, 20(5), 13-18.
- Bizer, G. Y., Krosnick, J. A., Petty, R. E., Rucker, D. D., & Wheeler, S. C. (2000). "Need for Cognition and Need to Evaluate in the 1998 National Election Survey Pilot Study," National Election Studies Report.
- Burnkrant, R. E., & Unnava, H. R. (1987). Effects of variation in message execution on the learning of repeated brand information. In M. Wallendorf & P. Anderson (Eds.), *Advances in Consumer Research* (Vol. 14) (pp. 173-176). Provo, UT: Association for Consumer Research.
- Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social Psychology*, 42(1), 116-131. doi: 10.1037/0022-3514.42.1.116
- Cacioppo, J. T., Petty, R. E., Feinstein, J. A., & Jarvis, W. B. G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, 119(2), 197-253. doi: 10.1037/0033-2909.119.2.197
- Cacioppo, J. T., Petty, R. E., & Kao, C. F. (1984). The efficient assessment of need for cognition. *Journal of Personality Assessment*, 48(3), 306-307. doi: 10.1207/s15327752jpa4803_13
- Cacioppo, J. T., Petty, R. E., Kao, C. E., & Rodriguez, R. (1986). Central and peripheral routes to persuasion: An individual difference perspective. *Journal of Personality and Social Psychology*, 51(5), 1032-1043. doi: 10.1207/s15327752jpa4803_13
- Cacioppo, J. T., Petty, R. E., & Morris, K. J. (1983). Effects of need for cognition of message evaluation, recall, and persuasion. *Journal of Personality and Social Psychology*, 45(4), 805-818. doi: 10.1037/0022-3514.45.4.805
- Coutinho, S. A., & Woolery, L. M. (2004). The need for cognition and life satisfaction among college students. *College Student Journal*, 38(2), 203-206.
- Ehrenberg, A. S. C. (1974). Repetitive advertising and the consumer. *Journal of Advertising Research*, 14(2), 25-34.
- Ewing, G., & Sarigollu, E. (2000). Assessing consumer preferences for clean-fuel vehicles: A discrete choice experiment. *Journal of Public Policy & Marketing*, 19(1), 106-118.
- Gorn, G. J., & Goldberg, M. E. (1980). Children's response to television commercials. *Journal of Consumer Research*, 6(4), 421-424. doi: 10.1086/208785
- Grass, R., & Wallace, W. H. (1969). Satiation effects of TV commercials. *Journal of Advertising Research*, 9(3), 3-8.
- Greenberg, A., & Suttoni, C. (1973). Television commercial wearout. *Journal of Advertising Research*, 13(5), 47-54.
- Hagtvedt, C. P., 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(3), 239-260. doi: 10.1016/S1057-7408(08)80038-1
- Hagtvedt, C. P., Schumann, D. W., Schneier, W. L., & Warren, W. L. (1994). Advertising repetition and variation strategies: Implications for understanding attitude strength. *Journal of Consumer Research*, 21(1), 176-189. doi: 10.1086/209391
- Henning, B., & Vorderer, P. (2001). Psychological escapism: Predicting the amount of television viewing by need for cognition. *Journal of Communication*, 51(1), 100-120. doi: 10.1111/j.1460-2466.2001.tb02874.x
- Inman, J. J., McAlister, L., & Hoyer, W. D. (1990). Promotion signal: Proxy for a price cut? *Journal of Consumer Research*, 17(1), 74-81. doi: 10.1086/208538
- Kivetz, R., & Simonson, I. (2000). The effects of incomplete information on consumer choice. *Journal of Marketing Research*, 37(4), 427-448. doi: 10.1509/jmkr.37.4.427.18796
- Kumar, V., Petersen, J. A., & Leone, R. P. (2007). How valuable is word of mouth? *Harvard Business Review*, 85(10), 139-146.
- Lynch, J., & Schuler, D. (1994). The matchup effect of spokesperson and product congruency: A schema theory interpretation. *Psychology & Marketing*, 11(5), 417-445. doi: 10.1002/mar.4220110502
- McCullough, J. L., & Ostrom, T. M. (1974). Repetition of highly similar messages and attitude change. *Journal of Applied Psychology*, 59(3), 395-397. doi: 10.1037/h0036658
- Nan, X. (2009). The influence of source credibility on attitude certainty: Exploring the moderating effects of timing of source identification and individual need for cognition. *Psychology and Marketing*, 26(4), 321-332. doi: 10.1002/mar.20275
- Parasuraman, R., & Riley, V. (1997). Humans and automation: Use, misuse, disuse, abuse. *Human Factors*, 39(2), 230-253. doi: 10.1518/001872097778543886
- Petty, R. E., & Briñol, P. (2012). The elaboration likelihood model. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 224-245). London: Sage.
- Petty, R. E., & Cacioppo, J. T. (1986). The elaboration likelihood model of persuasion. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. New York: Academic Press.
- Petty, R. E., Rucker, D. D., Bizer, G. Y., & Cacioppo, J. T. (2004). The elaboration likelihood model of persuasion. In J. S. Seiter & R. H. Gass (Eds.), *Perspectives on persuasion, social influence and compliance gaining*. Boston: Allyn & Bacon.
- Petty, R. E., & Wegener, D. T. (1999). The elaboration likelihood model: Current status and controversies. In S. Chaiken & Y. Trope (Eds.), *Dual process theories in social psychology*. New York: Guilford Press.
- Petty, R. E., Wells, G. L., & Brock, T. C. (1976). Distraction can enhance or reduce yielding to propaganda: Thoughtful disruption versus effort justification. *Journal of Personality and Social Psychology*, 34(5), 874-884. doi: 10.1037/0022-3514.34.5.874
- Pindyck, R. S. (1991). Irreversibility, uncertainty, and investment. *Journal of Economic Literature*, 29(3), 1110-1148.
- Priester, J. R., & Petty, R. E. (2003). The influence of spokesperson trustworthiness on message elaboration, attitude strength, and advertising effectiveness. *Journal of Consumer Psychology*, 13(4), 408-421. doi: 10.1207/S15327663JCP1304_08
- Putrevu, S. (2008). Consumer responses toward sexual and nonsexual appeals: The influence of involvement, need for cognition (NFC), and gender. *Journal of Advertising*, 37(2), 57-69. doi: 10.2753/JOA0091-3367370205

ADVERTISEMENT VARIATION

- 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(1), 52-62. doi: 10.1086/209240
- Rossi, P. E., & Allenby, G. M. (2003). Bayesian statistics and marketing. *Marketing Science*, 22(3), 304-328. doi: 10.1287/mksc.22.3.304.17739
- Rust, R. T., Lemon, K. N., & Zeithaml, V. A. (2004). Return of marketing: Using customer equity to focus marketing strategy. *Journal of Marketing: Special Issue: Practitioner Academic Collaborative Research*, 68(1), 109-127. doi: 10.1509/jmkg.68.1.109.24030
- Sargent, M. J. (2004). Less thought, more punishment: Need for cognition predicts support for punitive responses to crime. *Personality and Social Psychology Bulletin*, 30(11), 1485-1493. doi: 10.1177/0146167204264481
- Schumann, D. W., & Clemons, D. S. (1989). The repetition/variation hypotheses conceptual and methodological issues. In T. Srull (Ed.), *Advances in Consumer Research* (Vol. 16). Provo, UT: Association for Consumer Research.
- Schumann, D. W., Petty, R. E., & Clemons, D. S. (1990). Predicting the effectiveness of different strategies of advertising variation: A test of the repetition-variation hypotheses. *Journal of Consumer Research*, 17(2), 192-202. doi: 10.1086/208549
- Sivadas, E., & Dwyer, F. R. (2000). An examination of organizational factors influencing new product success in internal and alliance-based processes. *Journal of Marketing*, 64(1), 31-49. doi: 10.1509/jmkg.64.1.31.17985
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson.
- Unnava, H. R., & Burnkrant, R. E. (1991). Effects of repeating varied ad execution on brand name memory. *Journal of Marketing Research*, 28(4), 406-416. doi: 10.2307/3172781
- Ventura, A. K., & Mennella, J. A. (2011). Innate and learned preferences for sweet taste during childhood. *Current Opinion in Clinical Nutrition & Metabolic Care*, 14(4), 379-384. doi: 10.1097/MCO.0b013e328346df65
- Zhang, Y., & Buda, R. (1999). Moderating effects of need for cognition on responses to positively versus negatively framed advertising messages. *Journal of Advertising*, 28(2), 1-15.