

Self-Schema Matching and Attitude Change: Situational and Dispositional Determinants of Message Elaboration

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Research indicates that messages or products matching individuals' self-schemata are viewed more favorably, but little is known about how or when such effects occur. Experiment 1 indicates that messages matched to participants' level of extroversion lead to larger argument quality effects on attitudes than do mismatched messages. In experiment 2, these effects are replicated with the self-schema of need for cognition. Across studies, matching messages to recipients' self-schemata leads to increased or decreased persuasion, depending on the advertisement's argument quality. The interaction of self-schema matching with argument quality along with participants' pattern of cognitive responses suggests an elaboration-based account.

Knowledge about one's traits and personality characteristics is abundant and can exert considerable influence on information processing (see Baumeister 1998). Individuals have beliefs about whether they are outgoing or shy, bellicose or pacifistic, or brave or cowardly, and these beliefs shape the attention, encoding, and retrieval of information. Research suggests that self-knowledge is stored in the form of self-schemata, or generalizations about the self gleaned from prior experiences (Markus 1977). Despite the importance of self-schemata in directing the processing and interpretation of information, relatively little work has examined how persuasive appeals can use these schemata to maximize persuasion. Thus, although research has examined how appeals to an individual's attitude functions (Snyder and DeBono 1985) or attitude bases (i.e., affective vs. cognitive; Edwards 1990) can influence recipients' favorability toward attitude objects, work on self-schemata has been limited.

The term "self-schema" refers to the "cognitive gener-

alizations about the self . . . that organize and guide the processing of self-related information contained in the individual's social experiences" (Markus 1977, 64). These schemata reflect the way that individuals articulate their self-characteristics and think about themselves. As Markus (1977, 64) put it, "Self-schemata can be viewed as a reflection of the invariances people have discovered in their own social behavior." Like other schemata, self-schemata have been conceptualized as organizing structures with processing implications. That is, self-schemata contain stored knowledge about the self, and they direct attention to information and guide behavior (Markus and Wurf 1987). Because information about one's own personality characteristics is abundant, highly elaborated, and highly important, appeals to self-schemata could prove effective in influencing attitude change.

Prior persuasion experiments on self-schemata have demonstrated that matching a message or a product to an individual's personality characteristics enhances favorable reactions. Self-schema matching refers to presenting individuals with a message that appeals or conforms to some aspect of a person's self-conception. In one early example, Cacioppo, Petty, and Sidera (1982) devised arguments about abortion and capital punishment that were either legalistic (e.g., "The right to life is one that is constitutionally safeguarded") or religious (e.g., "There is a sacramental quality to the nature of life that demands that we show the utmost reverence for it"). People with a legalistic self-schema (i.e., those who were relatively quick to identify legalistic terms such as

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"shrewd" as self-descriptive) found the legalistic arguments to be more persuasive, whereas individuals with a religious self-schema (i.e., those who were relatively quick to identify religious terms such as "devout" as self-descriptive) found the religious arguments to be more persuasive. Thus, self-schema-matched messages were perceived to be more persuasive than mismatched messages. Similarly, Aaker (1999) showed that individuals exhibit a preference for brands that match both their own self-schemata and the schemata appropriate for different situations. For example, rugged brands are preferred by individuals who consider themselves to be rugged as well as by individuals who plan to be in a rugged setting (e.g., on a camping trip; see also Sirgy 1982).

Similar effects have been obtained by matching aspects of advertisements to individuals' ethnic or racial identities, although such effects depend on the extent to which the identity is a central and salient feature of the self-concept. For example, ads in which the sources' or actors' ethnicities match the recipients' are viewed more favorably than those with mismatching sources, but only when the ethnicity is perceived to be important (e.g., as the result of being a member of a numeric minority or by being lower in social status; Grier and Deshpande 2001) and is a salient aspect of identity (Deshpande and Stayman 1994; Grier and Deshpande 2001). Hence, matching to demographic features can also increase persuasion so long as the dimension is salient and self-defining for the person (see also Reed and Forehand 2003).

Although studies have provided evidence that self-schema matching can increase attitude favorability, it is less clear why this effect occurs and whether self-schema matching can ever be detrimental to persuasion. Whether a main effect is always to be expected depends on the process by which self-schemata produce their impact on persuasion. For example, if self-schema matching serves as a simple positive cue (e.g., "it fits me, so I like it"), then matching would be expected to enhance favorability and work especially well in situations in which the likelihood of thinking was low (Petty and Cacioppo 1986; Petty, Wheeler, and Bizer 2000). By contrast, if self-schema matching were to increase cognitive elaboration, then it should tend to increase persuasion mostly when arguments are strong and compelling but tend to decrease persuasion when arguments are weak and specious (Petty and Cacioppo 1986). Because most self-schema-matching studies presumably used strong (or no) arguments in the messages, only the favorability effect would be observed. In fact, other literatures examining matches to factors such as attitude functions also began with main effect predictions and findings and later evolved to more complex results that were moderated by argument quality and other variables (for a review, see Petty et al. 2000).

Aside from this surface similarity to other literatures, there are conceptual reasons to expect that self-schema matching might also increase message elaboration. Most notably, self-schemata, like other organizational cognitive structures, act as perceptual filters, determining which information is im-

portant to selectively attend to and elaborate on and which information is not (Markus 1977). To the extent that self-schemata serve this filtering role, messages that match a person's self-schema should be thought about to a greater extent than messages that mismatch the schema. These differences in elaboration could lead to either increased or decreased favorability depending on the quality of the arguments in the message. When the message arguments are cogent, as in prior research, matching should tend to enhance persuasion because people would be more cognizant of the merits of the appeal. However, when the message arguments are specious, matching should tend to reduce persuasion because people would be more cognizant of the flaws in the message.

This article has two primary goals. The first is to examine the conditions under which self-schema matching increases persuasion. In doing so, we provide a framework for understanding when the dominant effect of increased persuasion can be undermined and even reversed. Second, and perhaps more important, we provide evidence for a specific mechanism that can underlie the effect of matching on persuasion.

Two experiments were conducted to isolate the domain and operation of self-schema matching effects. In experiment 1, participants read persuasive messages that matched or mismatched their measured level of extroversion (Eysenck, Eysenck, and Barrett 1985). The experiment used an argument quality manipulation to test a boundary condition for the matching-favorability effect and to examine the process by which self-schema matching occurs. In experiment 2, these effects were replicated with a different product and self-schema. In this experiment, the targeted self-schema was need for cognition (NC; Cacioppo, Petty, and Kao 1984), which is a variable that concerns the extent to which individuals enjoy and engage in effortful thought in a wide variety of situations. Hence, this study tests the counterintuitive prediction that individuals should think more about advertisements appealing to their self-schema, regardless of whether that schema is one for being a thinker or a nonthinker.

EXPERIMENT 1

In experiment 1, the personality dimension of extroversion and introversion was selected as the focus of the self-schema appeal. Extroversion-introversion has been postulated to arise from differences in activation of the autonomic nervous system; extroverts enjoy social interactions more than introverts because they have higher thresholds for such activation and, hence, find social interactions less arousing (Eysenck 1967). Research on personality structure has consistently indicated that the extroversion-introversion dimension is a central component of personality that accounts for a large amount of variance in personality differences across individuals (e.g., McCrae and Costa 1987). Extroversion-introversion is a dimension about which individuals can quickly make judgments about others (Ambady and Rosenthal 1993) with high levels of consensus (Kenny et al. 1994).

and there are high levels of agreement between others' judgments and targets' own self-reports concerning extroversion (Watson 1989). Hence, extroversion is a central component of personality and one for which nearly all individuals can make fast and accurate judgments. Because of these properties, extroversion-introversion seemed like a good dimension with which to test the self-schema matching predictions.

The moderator we examined in this experiment was argument quality. Argument quality is a primary method for determining the extent of message elaboration (Petty and Cacioppo 1986). It was hypothesized that individuals reading messages that matched their self-schemata would elaborate more on the persuasive message than individuals reading messages that mismatched their self-schemata. Accordingly, attitudes of individuals in the matched conditions should better reflect the quality of the arguments in the message than attitudes of individuals in the mismatched conditions. This global pattern would be indicated by an interaction among message frame, extroversion, and argument quality and is stated formally in the following elaboration matching hypothesis:

- H1:** Argument quality will moderate the matching-favorability effect on attitudes such that message matching will tend to increase differentiation between strong and weak arguments relative to message mismatching.

METHOD

Overview

Participants were told that they would be completing an experiment that involved the evaluation of different advertisements. All experimental materials were presented and completed on computers using Medialab software (Jarvis 2000). Participants read two advertisements. The first advertisement was a filler ad. The second advertisement contained an introductory paragraph that appealed to either introverts or extroverts and contained either strong or weak arguments. After reading each advertisement, participants reported their attitudes toward the object advertised in the message and completed a measure of extroversion (Eysenck et al. 1985). At the conclusion of the experiment, participants were thanked, debriefed, and dismissed.

Participants

Participants were 126 undergraduate students who received partial course credit in compensation for their participation in the experiment.

Procedure

Participants were told that they would be rating a variety of products and services, and all participants read two advertisements. The filler advertisement was for a fictional music club. None of the information in the music club ad-

vertisement was related to extroversion or the target advertisement. The target advertisement was for a fictional brand of videocassette recorder (VCR). Manipulated within the target ad were the message frame (introvert vs. extrovert appeal) and the quality of the arguments (strong vs. weak arguments). The message frame was manipulated in an introductory paragraph, and the arguments concerning the product attributes were manipulated in the body of the advertisement text. This construction permitted orthogonal manipulation of message frame and argument quality. The orthogonal manipulation of message frame and argument quality is desirable, because it rules out potential comprehension ability or familiarity differences across matched and mismatched frames. Participants were randomly assigned to receive one of the four messages.

Independent Variables

Message Framing. The title and introductory paragraph constituted the extroversion-introversion message frame manipulation. An example of a sentence within the extrovert frame is, "With the Mannux VCR, you'll be the life of the party, whether the party's in your home or out of it." An example of a sentence within the introvert frame is, "With the Mannux VCR, you can have all of the luxuries of a movie theater without having to deal with the crowds."

Argument Quality. The message arguments followed the frame and were manipulated either to strongly support or to weakly support the VCR but be irrelevant to the introvert-extrovert dimension. An example of a strong argument is, "The VCR includes a deluxe digital, on-screen timing program that determines how much tape is left, how much time is left in the current program, and how long the current program has been playing." An example of a weak argument is, "The VCR includes an eject button on its front face that permits you to remove the video and get a rough idea of how much tape is left."

Extroversion Measurement. After completing all of the dependent variables (see below), participants completed the Eysenck Personality Questionnaire—Revised (EPQ-R) Short Version (Eysenck et al. 1985). The shortened version contains four 12-item subscales: extroversion, psychoticism, neuroticism, and a lie scale. Participants indicated whether each statement was characteristic of them by circling "Yes" or "No." Although the extroversion subscale was the only scale of interest for the purposes of this experiment, participants completed the entire 48-item scale in which the 12 extroversion items were embedded. This was done to reduce the chances that participants would perceive a link between the persuasive messages and the personality scale. The extroversion subscale has been shown to exhibit good internal reliability (α values in mid-to-upper .8 range; Eysenck et al. 1985) and provides an expedient means of assessing extroversion.

Dependent Measures

After reading the message, participants indicated their attitudes and perceptions on a number of measures.

Brand Attitudes (Abrand). Participants indicated their positivity toward the Mannux VCR along six seven-point semantic differential scales. The scale anchors were good-bad, favorable-unfavorable, positive-negative, desirable-undesirable, beneficial-harmful, and convincing-unconvincing. These items exhibited internal consistency ($\alpha = .96$).

Participants also rated the believability and desirability of the product having the features described in the advertisement. The believability rating was assessed by a question asking, "To what extent did you believe that the VCR possessed the features stated?" The desirability rating was assessed by a question asking, "Assuming the VCR DID possess the features stated, how desirable were the features in general?" Each of these questions was accompanied by a seven-point scale anchored by 1 = not at all and 7 = very much. To form an attitude measure, the believability and desirability ratings were multiplied to form an expectancy-value variable. This variable is derived from attitude theory, which suggests that positive attitudes are the result of perceiving an attitude object as highly likely to yield positive features or outcomes (Fishbein and Ajzen 1975). To the extent that the features of the VCR are perceived to be undesirable or to the extent that positive features are unbelievable, attitudes, as reflected in this computation, should be less positive. This expectancy-value index effectively taps the belief component of attitudes (Ajzen and Fishbein 1980), which corresponds closely to our argument quality manipulation.

Cognitive Responses. Participants were instructed to list the thoughts that they had while reading the advertisement. Each thought was to be listed in a separate box. After recording their cognitive responses, participants were instructed to rate each thought as positive, neutral, or negative toward the VCR.

Behavioral Intentions. Two questions assessed participants' behavioral intentions with respect to the VCR. The first asked, "If you needed a VCR, how likely would you be to purchase the Mannux VCR?" and "How likely would you be to recommend this VCR to others?" Both questions were accompanied by scales anchored by 1 = not at all likely and 7 = extremely likely. These items were averaged to form a behavioral intention index ($\alpha = .98$).

Perceptions of Argument Quality. To assess participants' perceptions of the quality of the arguments more directly, we asked them, "How strong were the arguments in favor of the Mannux VCR?" Participants responded on a seven-point scale anchored by 1 = not at all and 7 = very much.

Self-Reported Cognition. Although it was unclear whether participants would be aware of their differential

processing across matched and mismatched messages, we included items to assess participants' self-reported cognition. The four items were, "To what degree did you pay attention to the message you read about the VCR?" "Did you think deeply about the information contained in this message?" "How much effort did you put into reading the message?" and "How personally involved did you feel with the issue you read about?" These items were averaged to form a self-reported cognition index ($\alpha = .81$).

Suspicion Check. Participants reported their beliefs concerning the purpose of the experiment and whether they believed there was a link between the different experimental tasks (and, if so, what it was). Although a number of participants were aware that personality was measured at the end of the experiment, only one participant reported suspicion that "different personalities" might allocate differential attention to the ads. Dropping this participant from the analyses does not affect the results.

RESULTS

Effects of Message Frame on Extroversion Scores

One concern with our procedure was that it was possible for the manipulated message frame to bias participants' reports of their own extroversion on the EPQ-R. To test this possibility, an independent samples *t*-test was conducted. This *t*-test was nonsignificant ($t(1, 124) = .60, p = .55$, introvert message $M = 9.00$, extrovert message $M = 8.63$), indicating that participants' responses to the scale items were uncontaminated by the message frame manipulation.

Brand Attitudes (Abrand)

As expected, the two brand attitude measures (i.e., semantic differential and expectancy \times value) were highly correlated ($r = .76, p < .0001$), and they loaded on a single factor accounting for 88% of the variance. Thus, to simplify presentation and to provide a more reliable index of participants' attitudes, an attitude index was computed. This index is equal to the mean of the standardized values for the two brand attitude measures.

Examination of the distribution of extroversion scores revealed that this distribution was highly skewed toward extroversion ($p < .001$), and so we conducted a tertiary split on extroversion scores. The upper third of the distribution was labeled high extroversion, the middle third was labeled moderate extroversion, and the lower third was labeled low extroversion. Analyses on Abrand were conducted using a 2 (message frame: introvert vs. extrovert) \times 2 (argument quality: strong vs. weak) \times 3 (extroversion: low vs. moderate vs. high) ANOVA. Larger argument quality effects were predicted to occur in highly matched, rather than highly mismatched, message conditions. These relative differences in the impact of argument quality would lead individuals to tend to be more persuaded by matched messages when

arguments are strong, but somewhat less persuaded by matched messages when arguments were weak.

The ANOVA on brand attitudes yielded a significant main effect of argument quality ($F(1, 110) = 52.48, p < .0001$) and a main effect of extroversion ($F(2, 110) = 3.23, p = .04$). Importantly, these effects were qualified by the predicted message frame \times extroversion \times argument quality interaction ($F(2, 110) = 4.47, p = .01$). As indicated in the top panel of table 1, the effect of argument quality depended on the extent of message matching. To test this effect more precisely, we conducted a planned contrast to assess whether the argument quality effects were larger in the matched (high extroverts-extroversion frame/low extroverts-introversion frame), rather than the mismatched (high extroverts-introversion frame/low extroverts-extroversion frame), cells of our design (Kirk 1982; one-tailed probabilities reported). This analysis indicated that participants' attitudes were more reflective of the quality of the arguments when the message frame matched, rather than mismatched, their level of extroversion ($F(1, 110) = 8.57, p < .005$). Follow-up least significance difference (LSD) comparisons indicated that the argument quality effects were nearly four times larger when the message frame provided a strong match to participants' level of extroversion ($F(1, 110) = 29.43, p < .0001$) than when the message frame provided a strong mismatch to participants' level of extroversion ($F(1, 110) = 6.37, p = .01$). Thus, the argument quality effect was greater when the message provided the best match to the schemata of message recipients than when mismatching was at a maximum.

Cognitive Responses

A cognitive response index was computed as the difference in the number of positive thoughts and the number of

negative thoughts divided by the total number of thoughts. The ANOVA on the cognitive response index yielded only a significant main effect of argument quality ($F(1, 110) = 12.24, p = .001$) such that individuals' thoughts were more favorable to the strong than to the weak arguments.

Behavioral Intentions

Behavioral intentions were also analyzed using the tertiary split measure of extroversion. This ANOVA yielded a significant main effect of argument quality ($F(1, 110) = 48.42, p < .0001$) and a main effect of message frame ($F(1, 110) = 3.87, p = .05$). Additionally, the predicted message frame \times extroversion \times argument quality interaction was significant ($F(2, 110) = 4.47, p = .01$). As indicated in the third panel of table 1, the effect of argument quality depended on the extent of message matching (planned contrast, $F(1, 110) = 8.87, p < .005$). Follow-up LSD comparisons indicated that the argument quality effects were over four times larger when the message frame provided a strong match to participants' level of extroversion ($F(1, 110) = 35.76, p < .0001$) than when the message frame provided a strong mismatch to participants' level of extroversion ($F(1, 110) = 6.82, p = .06$). Thus, the pattern on behavioral intentions followed that for attitudes.

Perceptions of Argument Quality

To assess directly the extent to which participants were attentive to variations in argument quality, we asked them how strong they perceived the arguments to be. The ANOVA on perceptions of argument quality yielded significant main effects of manipulated argument quality ($F(1, 110) = 38.09, p < .0001$), message frame ($F(1, 110) = 4.03, p = .05$), and extroversion ($F(1, 110) = 4.75, p = .01$). Addi-

TABLE 1
MEANS FOR DEPENDENT VARIABLES AS A FUNCTION OF MESSAGE FRAME, EXTROVERSION, AND ARGUMENT QUALITY (EXPERIMENT 1)

Dependent variable and participant extroversion	Introvert message frame		Extrovert message frame	
	Weak arguments	Strong arguments	Weak arguments	Strong arguments
Brand attitudes:				
Low	-1.10 _a (.258)	.814 _b (.203)	-.526 _c (.203)	-.292 _c (.298)
Moderate	-.168 _c (.231)	.787 _b (.203)	-.546 _c (.220)	.412 _{a,b} (.189)
High	-.468 _c (.195)	.546 _b (.276)	-.571 _c (.422)	.696 _b (.243)
Cognitive responses:				
Low	-.708 _a (.243)	.226 _b (.190)	-.617 _{a,c} (.190)	-.583 _c (.280)
Moderate	-.252 _a (.217)	.378 _b (.190)	-.250 _{a,c} (.207)	-.243 _c (.177)
High	-.708 _a (.184)	-.033 _b (.260)	-.667 _a (.397)	-.065 _{a,b,c} (.229)
Behavioral intentions:				
Low	1.38 _a (.598)	5.62 _b (.469)	2.50 _a (.469)	2.92 _{a,d} (.690)
Moderate	3.35 _c (.535)	5.23 _b (.469)	2.82 _{a,c} (.510)	3.93 _a (.437)
High	2.29 _c (.452)	4.86 _b (.639)	1.33 _{a,c} (.976)	5.22 _c (.564)
Perceptions of argument quality:				
Low	1.63 _c (.565)	5.54 _b (.444)	2.92 _{a,d} (.444)	2.17 _c (.653)
Moderate	3.20 _a (.506)	5.31 _b (.444)	3.36 _a (.482)	4.73 _a (.413)
High	2.86 _a (.427)	5.29 _b (.605)	2.00 _a (.923)	4.78 _b (.533)

NOTE.—Means within each factor and dependent variable that do not share a common subscript differ at $p < .05$ (one tailed). Standard errors appear in parentheses.

tionally, there was a significant message frame argument quality interaction ($F(1, 110) = 6.95, p = .01$). Importantly, these effects were qualified by the predicted message frame \times extroversion \times argument quality interaction ($F(2, 110) = 5.64, p = .005$). As indicated in the bottom panel of table 1, the effect of argument quality depended on the extent of message matching (planned contrast, $F(1, 110) = 10.10, p < .005$). Follow-up LSD comparisons indicated that the argument quality effects were over nine times larger when the message frame provided a strong match to participants' level of extroversion ($F(1, 110) = 27.08, p < .0001$) than when the message frame provided a strong mismatch to participants' level of extroversion ($F(1, 110) = 2.39, p = .13$). As expected, matching the message to a self-schema led to greater detection of argument quality than mismatching.

Self-Reported Cognition

The ANOVA on participants' self-reported cognition yielded only a message frame \times extroversion interaction ($F(2, 110) = 4.33, p = .02$). Within the introversion message frame condition, there was a trend ($F(1, 110) = 2.06, p = .13$) such that people low in extroversion ($M = 5.77$) reported greater levels of thought than highly extroverted people ($M = 4.73, p < .05$), and moderately introverted people reported levels of thought in between ($M = 5.35$). Within the extroversion message frame condition, there was a finding ($F(1, 110) = 3.19, p = .05$) such that highly extroverted people ($M = 6.54$) tended to report greater levels of thought than those low ($M = 5.45, p = .10$) or moderate ($M = 4.99, p = .05$) in extroversion. Hence, participants had some sense of their own differential levels of elaboration across matching and mismatching frames.

DISCUSSION

The results of experiment 1 were generally consistent with our hypotheses. Matched messages led to larger effects of argument quality than did mismatched messages. As a result, when arguments were strong, matching tended to increase persuasion. When arguments were weak, matching tended to decrease persuasion. This pattern was shown for attitudes toward the brand, behavioral intentions, and perceptions of argument quality. In addition, these differential processing patterns tended to be reflected in participants' subjective perceptions. Specifically, participants tended to perceive themselves as allocating greater attention and effort toward reading the advertisement when it matched their self-schemata.

The somewhat different results for cognitive responses were unexpected. It is not clear why the results for this variable would differ from the results of the other variables. It is possible that features of the product category (VCRs in general) rather than the product itself (the Mannux VCR) were responsible for the anomalous results. The thoughts that participants listed often reflected aspects of the product category (e.g., "VCRs are outdated"), in addition to the

specific attitude object, and thus do not strictly reflect perceptions of the object described in the message, as do the other dependent variables. Additionally, many thoughts were ambiguous with respect to the target, and so coding for target versus category thoughts was unsuccessful. For example, the thought "I wouldn't buy one" could refer to the VCR category (i.e., they would prefer a DVD player over a VCR) or to the Mannux VCR in particular. In any case, although the cognitive response measure was insensitive to the matching effect, the dependent measures that more directly tapped product evaluation produced effects that were compatible with our hypothesis that matching would enhance information processing.

In experiment 2, we provided another test of the self-schema elaboration matching effect, and we used a different product category (i.e., toothpaste) to eliminate these potential product category effects. Additionally, we used a new self-schema matching variable to test the generality of self-schema matching effects beyond the dimension of extroversion. More specifically, we used the personality dimension of NC as the variable that was matched or mismatched by the advertisement. Need for cognition is an individual difference variable that corresponds with individuals' propensity to engage in and enjoy effortful cognitive activities.

EXPERIMENT 2

Experiment 2 used the self-schema variable of NC for two reasons. First, although there are almost certainly individual differences in the extent to which NC is a central and important schema for individuals, research has shown that NC is associated with many of the phenomena that Markus (1977) associated with schematicity (Feinstein 1996). For example, individuals who are high in NC rate themselves as extreme on cognizer traits, rate the traits as highly important, recall the traits effectively, and exhibit faster reaction times to relevant than irrelevant traits. Additionally, they manifest behaviors of individuals schematic on cognition by framing descriptions of their behavior in cognitive terms and by confidently judging others with respect to intellectual features. Hence, NC is an important, accessible, and salient self-dimension for many individuals.

Second, the use of NC as the self-schema leads to a rather interesting and counterintuitive prediction. A considerable amount of research on NC has shown that high NC (HNC) individuals are more influenced by argument quality differences in persuasive messages than are low NC (LNC) individuals, although motivational and ability factors can affect the extent to which HNC and LNC individuals will engage in extensive elaboration (Petty and Cacioppo 1986). In the context of a self-schema matching paradigm, the prediction would be that both HNC and LNC individuals would engage in greater elaboration of matched than mismatched messages and that this effect would sometimes lead to processing differences contrary to their general dispositional tendencies (e.g., LNC individuals receiving the low-thinking [matched] frame might lead to more thinking than HNC individuals receiving the low-thinking [mismatched] frame).

Of greatest interest, for the matching effect to be obtained, the self-schema match effect must sometimes override the chronic information processing tendencies of the message recipients as well as any possible direct effect of the message frame (e.g., that all individuals would more effortfully process the message with the thoughtful than with the non-thoughtful frame because of demand characteristics). Thus, obtaining the self-schema matching effect using the schema of NC would provide evidence for the robustness of self-schema matching as a determinant of elaboration.

METHOD

Overview

Participants were told that they would be completing an experiment that involved the evaluation of transcripts of radio advertisements from Great Britain. Participants read two advertisements. The first advertisement was a filler advertisement. The second advertisement was designed to appeal to either people who enjoy thinking or do not enjoy thinking and contained either strong or weak arguments. After reading the target transcript, participants reported their attitudes toward the object advertised in the message and completed the short form of the NC scale (Cacioppo et al. 1984). At the conclusion of the experiment, participants were thanked, debriefed, and dismissed.

Participants

Participants were 179 undergraduate students who received partial course credit in compensation for their participation in the experiment.

Procedure

Participants were told that they would be reading transcripts of radio advertisements that had been broadcast in Britain to see if they "work" in the United States. The first advertisement, a filler item, promoted a gasoline company ostensibly based in Britain. None of the information in the gasoline ad was related to NC or to the target ad. The second, target advertisement promoted Fluorident, ostensibly a brand of toothpaste available in Britain. Two components of the target advertisement were manipulated: the message frame (appeal to HNC vs. LNC people) and the quality of the message arguments (strong arguments vs. weak arguments). As in study 1, argument quality and message frame were manipulated orthogonally. The message frame was manipulated throughout the target transcript. After reading the message, participants reported their attitudes, thoughts, and perceptions of the advertisement.

Independent Variables

Message Framing. The message was framed to appeal to either HNC or LNC individuals. For example, the HNC-framed advertisement began with, "I'll bet you're the type

of person who likes to look at the details when you make choices. You want to know which choice is best, but you also want to know why." It concluded with "Fluorident: When you think about it, it's the only choice!" Conversely, the LNC-framed advertisement began with, "I'll bet you're the type of person who doesn't like to sit around and think about all of the little details when you make choices. You find what you're looking for and move on with your life." It concluded with, "Fluorident: No need to think twice! It's the only choice." Similar differences in wording appeared throughout the advertisement.

Argument Quality. The message arguments were manipulated either to strongly support or to weakly support the toothpaste. For example, participants who read the strong-argument transcripts read, "Its cool, minty flavour cleans your breath all day, and in a national consumer test, seven of ten people chose the flavour of Fluorident over the leading brand." People who read the weak-argument transcripts instead read, "Its cool, mint-like flavour cleans your breath for over an hour, and in a national consumer test, three of ten people chose the packaging of Fluorident over their current toothpastes."

Measurement of Need for Cognition. After completing all of the dependent variables (see below), participants completed the 18-item NC scale (Cacioppo et al. 1984). Participants indicated the extent to which each statement was characteristic of themselves on a five-point scale anchored by 1 = extremely unlike me and 5 = extremely like me.

Dependent Measures

After reading the message, participants indicated their attitudes and perceptions on the same set of items employed in experiment 1, with the exception that the last two semantic differential items, the self-reported cognition items, and behavioral intention items were not included. No participants reported suspicion regarding the procedures.

RESULTS

Effects of the Message Frame on Need for Cognition Scores

As in experiment 1, it was possible for the message frame to bias how participants responded to the NC scale. To test this possibility, an independent samples *t*-test was conducted. This *t*-test was nonsignificant ($t(1,177) = .60, p = .55$, LNC message $M = 62.97$, HNC message $M = 61.94$), indicating that participants' responses to the scale items were uncontaminated by the message frame manipulation.

Attitude Measures

Need for cognition scores were normally distributed, and participants were categorized as high or low in NC on the basis of a median split. Analyses were then conducted using

a message frame \times NC \times argument quality ANOVA with NC groups formed with a median split.

The two brand attitude measures (i.e., semantic differential and expectancy value) were highly correlated ($r = .65, p < .0001$), and they loaded on a single factor accounting for 82% of the variance. Thus, to simplify presentation and to provide a more reliable index of participants' attitudes, an attitude index was again computed as the mean of the standardized values for the two brand attitude measures.

Brand Attitudes (Abrand). The ANOVA on Abrand yielded a significant main effect of argument quality ($F(1, 165) = 41.01, p < .0001$). This effect was qualified marginally by the predicted message frame \times NC \times argument quality interaction ($F(1, 165) = 3.12, p = .08$, see top panel of table 2). As in experiment 1, follow-up planned contrasts tested whether the argument quality effect was larger in the matched (HNC—high thought message frame/LNC—low thought message frame) message frame conditions than in the mismatched (HNC—low thought message/LNC—high thought message) message frame conditions. This contrast was significant ($F(1, 165) = 3.44, p < .05$). Follow-up LSD comparisons indicated that the argument quality effects were over twice as large when the message frame matched participants' level NC ($F(1, 165) = 30.45, p < .0001$) than when message frame mismatched participants' level of NC ($F(1, 165) = 11.90, p = .001$).

Cognitive Responses. The ANOVA on the cognitive response index yielded a significant main effect of argument quality ($F(1, 165) = 14.05, p = .0002$). This effect was qualified by the predicted message frame \times NC \times argument quality interaction ($F(1, 165) = 4.23, p = .04$, see middle panel of table 2). A planned contrast indicated that the argument quality effect was larger in the matched, rather than the mismatched, message conditions ($F(1, 165) = 4.00, p < .05$). Follow-up LSD comparisons indicated that the argument quality effects were over nine times as large when the message frame matched participants' level of NC

($F(1, 165) = 15.37, p = .0001$) than when message frame mismatched participants' level of NC ($F(1, 165) = 1.58, p = .21$).

Perceptions of Argument Quality. The ANOVA on perceptions of argument quality yielded a significant main effect of manipulated argument quality ($F(1, 165) = 44.37, p < .0001$). This effect was qualified by a message frame \times NC \times argument quality interaction ($F(1, 165) = 4.23, p = .04$, see bottom panel of table 2). A planned contrast indicated that perceptions of argument quality were more reflective of actual argument quality in the matched, rather than the mismatched, message frame conditions ($F(1, 165) = 4.48, p < .05$). Follow-up LSD comparisons indicated that the argument quality effects were over 2.5 times as large when the message frame matched participants' level of NC ($F(1, 165) = 34.69, p < .0001$) than when message frame mismatched participants' level of NC ($F(1, 165) = 11.72, p = .001$).

DISCUSSION

Experiment 2 provided additional evidence that matching advertisements to individuals' self-schemata can lead to increased effects of the quality of the information in the ads. Both cognitive responses and attitudes were more reflective of the advertisement's argument quality when the message frame matched their level of NC, which is consistent with the possibility of differential cognitive elaboration across matched and mismatched message conditions. These effects are noteworthy in part because NC was the targeted self-schema. The self-schema matching effect was observed across participants' chronic disposition to engage in high or low levels of elaboration.

GENERAL DISCUSSION

Much contemporary research has examined how the self-concept can influence and be influenced by consumer behavior variables. Some such research has focused on ante-

TABLE 2

MEANS FOR DEPENDENT VARIABLES AS A FUNCTION OF MESSAGE FRAME, NEED FOR COGNITION, AND ARGUMENT QUALITY (EXPERIMENT 2)

Dependent variable and participant need for cognition	Nonthoughtful message frame		Thoughtful message frame	
	Weak arguments	Strong arguments	Weak arguments	Strong arguments
Brand attitudes:				
LNC	-.416 _a (.214)	.512 _b (.181)	-.190 _a (.173)	.337 _b (.181)
HNC	-.428 _{a,c} (.166)	.288 _b (.166)	-.663 _c (.181)	.495 _b (.177)
Cognitive responses:				
LNC	-.533 _a (.168)	.102 _b (.142)	-.337 _a (.136)	-.341 _{a,c} (.142)
HNC	-.522 _a (.130)	-.179 _b (.130)	-.520 _a (.142)	.063 _b (.139)
Perceptions of argument quality:				
LNC	2.87 _a (.385)	5.05 _b (.326)	3.78 _c (.311)	5.10 _b (.326)
HNC	3.32 _a (.298)	4.12 _c (.298)	2.95 _a (.326)	4.77 _{b,c} (.318)

NOTE.—LNC = low need for cognition; HNC = high need for cognition. Means within each factor and dependent variable that do not share a common subscript differ at $p < .05$ (one tailed). Standard errors appear in parentheses.

cedents of the self-concept. For example, Escalas and Bettman (2003) demonstrated that aspirations to be a member of a group can lead people to incorporate brands associated with that group into their self-concepts. Other such research has instead focused on the consequences of the self-concept. For example, individuals who reported that being health conscious was part of their self-concept also reported eating fewer animal products (Sparks and Guthrie 1998), and individuals who reported that recycling was a part of their self-concept were more likely to report having recycled in their homes (Terry, Hogg, and White 1999). Similarly, Kacen and Lee (2002) demonstrated that a person's independent-interdependent self-concept can predict impulse buying behavior.

The current research extends our understanding of the importance of self-schemata by providing evidence that self-schemata can affect attitude change outcomes in different ways, depending on the extent to which they are accurately targeted by advertisers. Across the two experiments, matching message framing to a self-schema was shown to increase the impact of argument quality on resulting attitudes. This is consistent with the hypothesis that self-schema-matched messages receive greater cognitive elaboration. These studies extend prior work on self-schema matching to demonstrate that self-schema matching need not invariably increase persuasion. In some cases, such as when the arguments in the message are specious, it may actually decrease persuasion. The notion that targeted advertisements increase favorability is almost taken for granted by many marketers, but the current studies show—across different self-schemata, different persuasive messages, and different products—that this assumption is not always warranted.

Understanding the mechanism whereby self-schema matching exerts its influence is important for understanding not only short-term attitude change outcomes, but also for understanding long-term outcomes. Attitude change that is based on high levels of elaboration is more likely to influence thought and behavior and more likely to be persistent over time and resistant to counterattack (Petty and Cacioppo 1986). Thus, because self-schema matching can increase message elaboration, it can be a useful tool for creating durable and influential attitudes.

Multiple Roles for Schema Matching

The results of studies 1 and 2 are consistent with the account that matching messages to individuals' self-schemata can increase elaboration. Under schema-matched conditions, participants' attitudes were more reflective of the quality of the arguments in the message rather than under schema-mismatched conditions. We do not believe that this is the only effect of schema matching, however. Other mechanisms may also operate in particular circumstances. For instance, the Elaboration Likelihood Model (Petty and Cacioppo 1986) indicates that many persuasion variables, such as self-schema matching, can influence persuasion via multiple processes.

For example, if the elaboration likelihood was constrained

to be low (e.g., the context was highly distracting), self-schema matching might increase favorability by acting as a cue. A message recipient may reason, "If the product is for me, I like it!" Research indicates that individuals prefer things associated with the self, whether they are the letters of one's own name (Nuttin 1985) or the members of one's arbitrary in-group (Tajfel 1981). Alternately, under high elaboration likelihood conditions, self-schema matching could increase favorability by biasing elaboration. Message recipients may be motivated to generate favorable cognitions about attitude objects linked to the self, especially if the self were somehow implicated by the quality of the product. Self-serving motivated reasoning has been well documented in the literature (see Baumeister 1998). Future research could examine these multiple roles directly by manipulating baseline elaboration likelihood within a schema-matching context. In the current research, the background elaboration context was not constrained to be high or low, and matching activated schemata to message frames led to greater message processing than mismatching.

Schematicity and Schema Strength

Markus (1977) outlined two criteria for determining schematicity, or the extent to which an individual was schematic for a given dimension. Specifically, to be classified as schematic, individuals had to rate themselves extremely on the dimension and rate it as very important to them. In the present experiments, these strict operational criteria were not used. That is, although individuals rated themselves on the dimensions of interest (extroversion-introversion or enjoyment of thinking), we did not assess the importance of these dimensions to the individuals. Thus, within each of our self-schema groups there were presumably subgroups who viewed the dimension as relatively important and unimportant. Although the matching effect was robust enough to occur among our general samples, the effect would presumably be stronger for those individuals for whom the dimension was a particularly important or salient aspect of their self concept. Because schematic individuals have more stable, central, and extreme self-conceptions along the relevant dimension, they should be more likely to notice and to identify correctly matching versus mismatching messages. Hence, because individuals in the present studies were not screened for schematicity, these experiments provide a strong test of the robustness of the elaboration matching effect.

Although Markus identified the dimensions of extremity and importance as the defining features of schematicity, there are many other, possibly related schema features that could affect persuasion outcomes. These include the accessibility of the schema, how well elaborated the schema is, how much knowledge on which the schema is based, and how certain the individual is about his or her standing on the schema dimension. Although Markus (1977) found that some of these dimensions (e.g., importance and accessibility) were correlated, they need not all be. Research on these constructs within the attitudes domain has indicated that

these different strength indicators do not load on to a single latent factor, and a stable multifactor structure has yet to emerge (Krosnick et al. 1993).

Even if the various dimensions of self-schemata were all highly correlated, they might be associated with different effects on persuasion outcomes. For example, as noted, self-schema importance might be expected to magnify the predicted outcomes for self-schema matching (e.g., important self-schemata could act as a stronger instigator of elaboration). However, high levels of certainty might operate differently. For example, individuals high in self-schema certainty might show matching effects as in the present experiments, but individuals low in certainty might effortfully process all information related to either pole (e.g., introversion or extroversion) of the self-schema dimension. Thus, like attitude strength variables, it is possible that these self-schema strength variables would exhibit somewhat complex and varied patterns, and a single factor model may oversimplify the true nature of these constructs.

Conclusion

The experiments in this article provide evidence regarding how and when self-schema matching increases persuasion. They challenge the notion that matching persuasive messages to recipients' self-schemata invariably increases persuasion and lend support to a differential elaboration account of matching-mismatching effects when elaboration is not constrained to be very high or low. This revised understanding raises new types of research questions and opens unexplored avenues of investigation.

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