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MANUSCRIPT (ROUND 1)

This Product's Got to Can Help Me!
The Impact of Reduced Self-Efficacy Beliefs on Motivated Reasoning of Product
Information

ABSTRACT

The authors identify a novel factor impacting motivated reasoning—self-efficacy. Three studies find that compared to consumers who have high personal efficacy to achieve a goal, those for whom efficacy beliefs are reduced are more likely to engage in motivated reasoning of product claims related to goal attainment. Specifically, they are more likely to (a) selectively search for information from a product-favorable information source, (b) regard this information as more credible, and (c) be less discriminating of low credibility message arguments. They also (d) require more negative information before they feel that they are able to evaluate a product's effectiveness, and (e) are more likely to judge the product as effective at helping them attain their goal. Motivated reasoning appears to act as a coping mechanism for consumers whose self-efficacy is threatened. By concluding that there is a marketplace means to facilitate goal attainment, a sense of efficacy is restored. The implications of this research for theory on motivated reasoning and self-efficacy, consumer vulnerability, and public policy are discussed.

Sheila stepped on the scale yesterday and discovered that she had gained ten pounds. Worrying that hormonal changes were making it more difficult for her to maintain her weight, she began to search for solutions. She thought about looking for information about weight by looking at medical sites on the Internet, but decided to look in weight loss magazines instead. She was particularly persuaded by an ad for one product that claimed to be unique in helping pre-menopausal women control weight. She thought the testimonial showing one woman who had lost 20 pounds provided very compelling evidence for the product's effectiveness. Although the ad had a lot of disclaimers, she disregarded them and decided to try the product for herself.

Considerable research has focused on attitude formation processes and their implications for attitude favorability and strength. That research amply demonstrates that attitude formation processes depend on consumers' motivation, ability, and opportunity to process information (e.g., Petty and Cacioppo 1986; MacInnis and Jaworski 1989). The findings and theoretical implications of this research are profound. However, recent research suggests that the predictions of these theories are most applicable when consumers have the motivation (ability, and opportunity) to form an *objective evaluation* of the product.

Under other conditions information processing and subsequent attitudes are impacted by a different motive—the motivation to arrive at a specific conclusion (e.g., Ahluwalia, Burnkrant and Unnava 2000; Keller and Block 1999; Kruglanski 1990; Kunda 1990; Jain and Maheswaran 2000). Research in this domain calls such processing "*motivated reasoning*" since processing is motivated by the conclusion consumers want to form. Objective processing and motivated reasoning share "motivation" as a central driver of information processing, however, the nature of the motivation differs. In the former case, consumers are motivated to uncover the true merits

of a product or service. In the latter case they are motivated to arrive at a conclusion that is self-serving—that is, the conclusion they *want* to reach.

The objective of this article is to identify a novel factor impacting motivated reasoning; perceived self-efficacy. Perceived self-efficacy is a psychological state that reflects confidence in one's own capabilities to organize and execute actions that lead to goal attainment (Bandura 1997). We propose that when individuals' perceived efficacy to achieve an important goal is threatened they engage in motivated reasoning of information about products that could help them achieve their goal. That is, they strategically search for, evaluate, and weigh information about marketplace offerings in a manner that allows them to conclude that their goal is attainable with the help of a goal-enabling product. The conclusion that the goal is attainable is self-serving because it serves to restore a sense of self-efficacy by identifying a means (the product) to otherwise threatened goal attainment.

Below, we introduce the constructs of self-efficacy and motivated reasoning. We then develop a conceptual model and set of hypotheses that link reduced self-efficacy, motivated reasoning, and subsequently restored efficacy beliefs. We test these hypotheses in three studies. The findings and their implications for theory and practice are discussed next. We end with a discussion of the studies' limitations and directions for future research.

CONCEPTUAL FRAMEWORK

Goals, Self-Efficacy and Coping

Research in psychology and consumer behavior has amply demonstrated the importance of goals as representational structures that guide the pursuit of desired end states (Austin and

Vancouver 1996; Bagozzi and Dholakia 1999; Huffman, Ratneshwar and Mick 2000). Previous research shows that a fit between goals and the opportunities, constraints and affordances inherent in individuals and their environments is a necessary condition for subjective well-being (Brunstein, Schultheiss and Maier 1999). Specifically, when consumers believe they have the self-efficacy to enact actions that will produce a desired goal (e.g., if I study, I will get a good grade; if I exercise, I will lose weight), they are motivated to act accordingly (studying, exercising). Such actions increase the likelihood of goal attainment and well-being. Bandura's (2000) comprehensive review of the self-efficacy literature finds that a sense of self-efficacy has been linked with a number of positive outcomes; effort, task persistence, goal attainment and positive affect. In contrast, when consumers lack confidence that they are capable of achieving a relevant goal (i.e., self efficacy is low), goal attainment is hindered by a sense of hopelessness, futility, fatalism and task avoidance.

Research on self-efficacy shows that self-efficacy beliefs can be *threatened* as a result of personal feedback (e.g., weight gain), environmental changes (e.g., increasingly high calorie content of food), or novel information (e.g., "women over age 40 are 50% less likely to lose weight than those under 40"). A reduction in perceived self-efficacy is disconcerting because it suggests that goal attainment (e.g., weight loss or lack of further weight gain) is also threatened. As a result of this reduced self-efficacy, individuals feel anxiety from a perceived loss of control over goal attainment. Coping mechanisms may be enacted to re-establish a sense of perceived control and self-efficacy, and hence regulate anxiety levels (Vancouver 2005).

In his review of the self-efficacy literature, Bandura (2000) identifies several ways in which individuals can cope with threatened self-efficacy and restore a sense of control. They can (a) focus on factors that enhance beliefs about coping abilities, (b) manage the thought processes

that evoke anxiety, (c) manage anxiety directly through techniques like self-relaxation, self-talk and diversionary recreational activities or (d) engage in transformational actions (e.g., buying or using products) that induce a sense of behavioral control.

Most relevant to consumer behavior are transformational actions like buying and using products as a means to create behavioral control. Products are instrumental means to the attainment of higher order needs and goals (Olson and Reynolds 1983; Ratneshwar, Mick and Huffman 2000). Hence, learning of the existence of these external means may restore a sense of self-efficacy *if* consumers believe that they can rely on them to facilitate goals attainment.

Importantly though, although products may serve as means that enhance goal attainment, whether they do so or not ultimately depends on their effectiveness. Because products vary in effectiveness, systematic search for and processing of product information may prompt the conclusion that the product is ineffective and cannot facilitate goal attainment. This conclusion is at odds with the conclusion consumers would like to draw—that their goal is attainable. If they cannot conclude that the product is effective and that their goal is attainable, their sense of personal control cannot be restored and anxiety will remain high. How do consumers' cope with this potential conclusion? We posit that they cope through a novel process heretofore not identified in the self-efficacy literature -- motivated reasoning.

Motivated Reasoning

Motivated reasoning is described as a set of cognitive processes and strategies driven by a *directional goal*, specifically, the goal to arrive at a specific conclusion (Kunda 1999).

Motivation, in this context, is “any wish, desire, or preference that concerns the outcome of a given reasoning task” (Kunda 1990). As Figure 1 shows, such tasks include gathering information, evaluating evidence, weighing the evidence, and forming a self-serving conclusion.

Thus, motivated reasoning is the process of searching for, evaluating and weighing information, and forming judgments with a self-serving goal-affirming purpose. Motivated reasoning involves biases, though these biases differ from cognitive biases. Cognitive biases result from the inability to attend to and process all available information. In contrast, motivational biases are associated with specific needs or desires of the individual, such as to form the particular conclusion consumers wish to make. They are not necessarily related to cognitive (in)ability or willingness to process information (Kruglanski and Ajzen 1983, p. 7).

Insert Figure 1 here

Prior research indicates that individuals are more likely to engage in motivated reasoning when they wish to (a) perceive themselves as free from risk (Kunda 1987; Sherman and Kunda 1989; Lieberman and Chaiken 1992; Menon, et al. 2002), (b) perceive themselves in a positive light (Kunda and Santioso 1989; Dunning, et al. 1995), or (c) reduce cognitive and attitudinal inconsistency (Jain and Maheswaran 2000; Ahluwalia, et al. 2000). For example, Jain and Maheswaran (2000) found that when consumers were exposed to information that was inconsistent with their preferences for a product they engaged in biased information evaluation. Ahluwalia, et al. (2000) found that when negative information about a brand was easy to refute, consumers who were strongly committed to a brand processed negative information in a way that allowed them to retain their initial impression of the brand's effectiveness.

Linking Self-Efficacy and Motivated Reasoning. As shown in Figure 1, we add to the literature on motivated reasoning by identifying self-efficacy as a novel predictor. We propose that when perceived self-efficacy related to achieving an important goal is threatened, consumers

cope by engaging in motivated reasoning of product information. As Figure 1 indicates, motivated reasoning is revealed by a set of indicators that relate to where consumers search for information, how they evaluate and weigh such information, and the self-serving conclusions they draw from it. Forming the conclusion that their goal is attainable with the help of marketplace means serves to restore their sense of efficacy.

STUDY 1

Study one was designed to provide initial evidence linking threatened self-efficacy to motivated reasoning of marketplace information. In study one, motivated reasoning is indicated by (a) selective information search, (b) biased evaluation of selected information, and (c) the formation of a self-serving conclusion regarding product effectiveness (see Figure 1).

Selective Information Search

If motivated reasoning is induced by threats to perceived self-efficacy it should be manifested in the choice of sources from which consumers prefer to gather information. Certain information sources are likely to be regarded as generally providing more favorable product information. Most notable among these are marketer-dominated sources like ads and salespeople. Other sources are regarded as more credible, and due to their more objective nature may provide varying degrees of positive and negative information about products. Examples include information published by independent evaluators and other non-marketer dominated sources like *Consumer Reports*, consumer news stories in the media, and government reports, among others.

Prior research shows that individuals who have a preferred conclusion in mind selectively test the hypothesis of the conclusion's veracity by asking questions that point to instances when

the hypothesis is confirmed, rather than disconfirmed (Sanbonmatsu, et al. 1998; Hoch and Ha 1986; Klayman and Ha 1987). We anticipate that when self-efficacy is threatened, consumers will be biased in their information search, favoring information sources that are more likely to have information that supports the product's effectiveness. This selective information search from product favorable sources enhances the likelihood that consumers will find hypothesis-confirming evidence. Such evidence hence enables the conclusion that the product will be effective and hence will promote goal attainment. By the same token, they should be less likely to search for information from impartial or non-marketer dominated sources that could disconfirm their desired conclusion (see Figure 1).

In contrast to consumers whose self-efficacy has been threatened, those with higher self-efficacy have less motivation to bias their information search. They already believe that their goal is attainable. These individuals can afford to be objective. They should reflect this objectivity by seeking less information from potentially biased and favorable sources. Instead, they should favor information from unbiased sources. For these consumers, source objectivity should be more important than the extent to which the source is likely to be "product-favorable". If lowered self-efficacy impacts motivated reasoning we should find that:

- H1:** Compared to consumers for whom perceived self-efficacy is higher, those whose perceived self-efficacy is reduced should search for (a) more pieces of information from a product favorable source (e.g., a product brochure) and (b) fewer pieces of information from an impartial source (e.g., a newspaper article).

Biased Information Evaluation

Research on motivated reasoning finds that motivated reasoning is also indicated by how consumers evaluate information (see Figure 1). In particular, individuals' may judge information

consistent with the conclusion they wish to draw as more credible. For example, Lord, Ross and Lepper (1979) asked respondents to read one study that was in favor of capital punishment and another that was against it. Respondents regarded whichever study was consistent with their own view on capital punishment as being more credible. Similar studies linking motivated reasoning with biased evaluation of message credibility have been reported by Pyszczynski, Greenberg and Holt (1985) and Kunda (1987). If self-efficacy impacts motivated reasoning we should find that:

H2: Consumers whose perceived self-efficacy has been threatened will regard the product's claims as more credible than will consumers whose self-efficacy has not been threatened.

Forming a Self-Serving Conclusion

Finally, motivated reasoning is indicated by the formation of a self-serving conclusion. Lord, Ross and Lepper (1979) found that after they viewed the same evidence, both individuals initially in favor of and those against capital punishment became stronger in their judgments about the social value of capital punishment. Dunning and Story (1991) observed that when individuals were told that social skills were more valuable to success than task skills, they judged themselves as being higher in social skills. When they were told that task skills were more valuable to success than social skills, they judged themselves as being higher in task skills. Kunda and Santioso (1989) observed similar results using traits instead of skills.

In the case of reduced self-efficacy, the conclusion consumers wish to draw is that a product that claims to facilitate attainment of a salient personal goal is actually effective. Since past research suggests that motivated reasoning is indicated by the conclusion that consumers form, we should find that:

H3: Compared to consumers whose perceived self-efficacy is not threatened, those whose perceived self-efficacy is threatened will judge a product that purports to facilitate goal attainment as more effective.

Design and Procedures

Study one was designed to test hypotheses one through three. Ninety-nine undergraduate students participated in a computer-based study that used a 2-way between-subjects design. Respondents were randomly assigned to one of two conditions designed to manipulate perceived self-efficacy. Self-efficacy was manipulated by varying respondents' confidence in and perceived capability of attaining a chronic, important, and highly relevant goal -- academic performance. Respondents, who were preparing for mid-term exams, were asked to judge the clarity, importance and informativeness of an abstract purportedly published in the *Journal of Educational Psychology*. The abstract suggested that stress either impaired (low self-efficacy) or improved (high self-efficacy) brain performance (see Appendix A). This manipulation allowed us to alter self-efficacy through environmental as opposed to internal factors that might inadvertently impact self-esteem (e.g., IQ, personal traits). The fact that the study took place during mid-term week enhanced the relevance of the focal goal (academic performance).

Respondents next participated in a purportedly different study on student well being ostensibly conducted by the Office of Student Affairs. That "study" asked students to report on a variety of things, including how confident and capable they felt (i.e., their self-efficacy) about achieving a high academic performance by the end of the semester.

Finally, respondents were told that they would participate in a different study that asked them to evaluate a new product that was relevant to threatened self-efficacy consumers—a

memory booster. Information about the product was minimal and was limited to a statement of its purported benefits. After seeing the product description participants proceeded to a computer screen where they could access product information from the manufacturer's brochure (a product favorable source) and a newspaper article about the product (an objective source). A total of 15 pieces of information could be examined from each source, for a total of 30 pieces of information. Participants clicked buttons on the computer screen that revealed the selected information. They were told that they were free to search for as much or as little product information as they deemed necessary from either source in order to evaluate the product.

After completing the information search task, respondents evaluated the product, then rated the perceived credibility of the set of arguments examined from each source. Several covariates, including mood, gender, and need for cognition were also obtained. These variables had no effects on the results reported in this study or those reported subsequently and hence are not discussed further.

Thirty pretest respondents verified that consumers expect product information in a newspaper article to be less favorable toward a product ($M = 2.13$, $t_{(29)} = -7.61$, $p < .01$) (1= newspaper; 9= brochure), more objective than ($M = 7.47$, $t_{(29)} = 10.79$, $p < .01$), and preferred over ($M = 6.07$, $t_{(29)} = 2.40$, $p < .05$) information found in a brochure.

Measures

Independent Variable. Two manipulation check items asked respondents to indicate how (a) capable they felt about getting a good grade by the end of the semester and how (b) confident they were that they would actually get a good grade (1=not at all; 9= very). As expected, these two items were correlated ($r = .71$). They were combined to form an overall self-efficacy scale.

Dependent Variables. The amount of information gathered from the brochure and the newspaper article respectively served as measures of information search. Respondents also used a nine-point scaled item to evaluate the credibility of product claims in the brochure and the newspaper article respectively. They also used a nine-point scaled item to judge product effectiveness (all items were anchored by 1 = not at all; 9 = very).

Results

Manipulation Check. A t-test between respondents in the higher versus lower self-efficacy conditions confirmed that respondents in the lower efficacy condition reported feeling significantly less self-efficacy ($M = 5.94$) than subjects in the higher efficacy condition ($M = 6.83$) ($t_{(98)} = 8.81, p < .01$). Hence, the self-efficacy manipulation was successful.

Test of Hypotheses. A series of t-tests compared (a) the amount of information higher versus lower efficacy consumers obtained from each source, (b) the perceived credibility of the product's claims, and (c) perceived product effectiveness. The results are shown in Table 1.

Insert Table 1 here

Consistent with hypothesis 1a, consumers in the lower efficacy condition searched for more information from the product favorable source (the brochure ($M = 8.35$)) than did consumers in the higher self-efficacy condition ($M = 6.40; t_{(98)} = 4.40, p < .05$). However, lower and higher self-efficacy consumers did not differ in the amount of information they gathered from the impartial source ($M = 5.96$ versus $6.77; t_{(98)} = .77, p = ns$). Thus, hypothesis 1b was not supported.

Consistent with hypothesis 2, respondents in the reduced efficacy condition also regarded the product's claims as more credible ($M = 4.61$) than did those in the higher efficacy condition ($M = 3.86, p < .05$).

Consistent with hypothesis 3, we observed that consumers in the reduced efficacy condition also regarded the product as more effective than did consumers in the high efficacy condition. ($M = 4.49$ versus $3.74, (t_{(98)} = 5.67; p < .05)$) (See Table 1).

Discussion

The results from study 1 suggest that when consumers' self-efficacy about attaining an important goal is threatened, they engage in motivated reasoning of marketplace stimuli. In the present study motivated reasoning was indicated by the lower self-efficacy consumers being more likely than their higher self-efficacy counterparts to search for information from a source perceived *a priori* as being more likely to provide favorable product information (the brochure). They also differed in information evaluation, concluding that product claims were more credible. Finally, they judged the product as being more effective than those in the higher efficacy condition. We surmise that these judgments are based on reduced efficacy consumers' desires to conclude that their goal can be attained—through use of a goal-enabling product.

Interestingly, high and low self-efficacy consumers differed only in their extent of information search for and evaluation of information from the product favorable source, not the impartial source. In retrospect, the lack of effects for the impartial source may be due to the fact that impartial sources can also provide favorable information. Lower efficacy consumers may search such sources because they wish to find hypothesis confirming information that such sources may indeed contain. Higher efficacy consumers may search such sources because they

wish to find information that is unbiased. Though having different motives, their extent of information search may not differ.

STUDY 2

Study two further examines the link between self-efficacy and motivated reasoning by examining the impact of self-efficacy on evaluation of information from the *same source*. Consistent with Figure 1, we also examine a different indicator of motivated reasoning—whether consumers can discriminate between arguments that are high versus low in credibility. Finally, study two was designed to rule out an alternative explanation for the results of study one. It is possible that the results in study one were not due to self-efficacy per se but rather to individual difference variables, including intelligence or logical reasoning capabilities. Although these potential confounds are unlikely due to random assignment of subjects to conditions, study two controls for these alternative explanations by showing that the effect of self-efficacy on motivated reasoning is limited to the processing of a goal relevant product. The effects are not observed when the *same consumer* (with the same traits and capabilities) evaluates a goal irrelevant product.

Discernment of Credibility

Prior research indicates that when consumers' are motivated to understand the true merits of a persuasive communication, and have the ability and opportunity to do so, they engage in critical thinking about the persuasive message (MacInnis and Jaworski 1989; Petty and Cacioppo 1986). This critical thinking enables a discernment of which arguments are credible and which are not. Arguments that lack credibility are discounted and hence have limited impact

on the evaluation judgment. Consumers who can discriminate between high and low credibility arguments are persuaded by the former, but not the latter (see Petty and Cacioppo 1986).

When self-efficacy is reduced, consumers want to conclude that the product effective. However, this conclusion cannot be reached if they regard the arguments about a goal-enabling product as lacking in credibility. As such, they have much to gain by concluding that an argument is credible. If they can conclude that an otherwise low credibility argument is actually credible, they can form the conclusion that they wish to form--- that is, that the product is effective and can help them attain their goal.

In a marketing communications context one factor impacting the credibility of product claims concerns the number of competitors who make similar claims. When a particular claim is made by many competing products, the claim becomes more believable compared to a claim made only by one product. This is closely related to the common heuristic, “if many believe it, it must be true” (e.g., Axsom, Yates and Chaiken 1987). In contrast, an uncommon claim is more likely to be seen as extraordinary, and thus less credible.

To assess the validity of this assumption, a pretest with 50 individuals confirmed that consumers regarded a claim that a product is the only one on the market to offer a particular benefit as less credible than they did a claim that the product is one of many on the market that offers that benefit. They also regarded such claims of a unique benefit with more skepticism.

We anticipated that since high efficacy consumers did not need to engage in motivated reasoning, they would process message arguments in an objective fashion and hence discriminate among high versus low credibility arguments. This discrimination would result in more favorable judgments of brands that use high versus low credibility claims. Thus, we anticipate that when

self-efficacy is higher and the product is relevant to goal attainment, consumers will be able to discriminate between high and low credibility claims about the product.

However, when self-efficacy is low and the product is relevant to goal attainment, consumers are motivated to believe that a product that claims to be the only one offering a goal relevant benefit is credible. Indeed, perceptions of goal attainability are, among other factors, a function of the awareness of alternative pathways that lead to goal achievement (Curry, et al. 1997). If consumers believe that there is only one product on the market that offers an important, goal relevant benefit, they have no other products that they can rely on to attain their goal. Hence the only way they can conclude that the product is effective and can facilitate goal attainment is to believe that the unique claim is credible.

If this were true, we would anticipate that when the product is relevant to an important goal, higher self-efficacy consumers will be better able to discriminate between high vs. low credibility claims than will consumers for whom self-efficacy is reduced. That is:

H4a: Higher efficacy consumers will judge a brand's claims as more credible when the product claims to be one of many vs. the only one on the market with the purported benefit.

H4b: In contrast, lower efficacy consumers will not differ in their judgments of a brand's claims regardless of whether it claims to be one of many versus the only one on the market with the purported benefit.

This ability to discriminate between high and low credibility arguments should in turn impact their evaluations of the product's effectiveness. Thus, we would anticipate that:

H5a: When self-efficacy is higher and the product is relevant to goal attainment, consumers will have more favorable judgments about product effectiveness when

claims are high in credibility (i.e., the product claims to be one of many on the market with the purported benefit) versus low in credibility claims (i.e., the product claims to be the only one on the market with the purported benefit).

H5b: When self-efficacy is lower and the product is relevant to goal attainment, consumers will have equally favorable judgments about product effectiveness regardless of whether the claims are high in credibility or low in credibility.

We anticipate that the results for H5b will be observed only when consumers evaluate a goal relevant product. When these same consumers evaluate a product that is not relevant to their threatened goal, they should process product information in a more objective fashion and hence discriminate between arguments that are high versus low in credibility. Such a result would rule out individual difference variables as alternative explanations for the results.

Design and Procedures

Eighty-one undergraduate students were randomly assigned to groups in a study that used a 2 x 2 x 2 mixed factorial design. Self-efficacy (low versus high) regarding the attainment of an important goal and the number of products on the market claiming to produce a given benefit (one (low claim credibility) versus many (high claim credibility)) were manipulated as between-subjects factors. The relevance of the product to attaining an important goal (getting good grades) versus a less important goal (getting stains out of fabrics) was a within-subjects factor. The order of presentation of the relevant and irrelevant product was counterbalanced. Presentation order had no effect on the results and is not discussed further.

The manipulation and measures of self-efficacy were identical to those described in study one. In a purportedly separate study participants were asked to sequentially consider advertising

for two new products; one that claimed to boost memory (goal-relevant product) and another that claimed to remove stains (goal irrelevant product). Respondents were shown two ads; one for a memory booster and one for a stain remover. Half of the respondents saw an ad in which the products claimed to be the only one on the market that produced the desired goal (better memory; removal of tough stains). The remaining half saw ads in which the products claimed to be one of many on the market that produced the advertised benefit. Participants completed measures of claim credibility and product effectiveness and were debriefed.

Measures

Independent Variables. The two items used to indicate self-efficacy were highly correlated ($r = .72$), and hence were combined to reflect a single measure of self-efficacy.

Dependent Variables. Argument credibility was assessed by a measure that asked respondents to indicate how credible they believed the product's claims were (1= not at all credible; 9= very credible). Brand evaluations were assessed using a two item nine-point measure that assessed participants' evaluations of the effectiveness and quality of the product (1= not at all; 9= very). A composite index was created using these two items ($r = .74$ and $.72$ for the memory and stain remover respectively).

Results

Manipulation Checks. The self-efficacy manipulation was successful ($F_{(1, 76)} = 9.03$). Respondents in the higher self-efficacy condition reported significantly greater perceived self-efficacy ($M = 6.77$) than did those in the lower self-efficacy condition ($M = 5.80$).

A manipulation check on the credibility of the message claims confirmed that respondents exposed to an ad for a product that claimed to be the only one on the market with the

purported benefit to be less credible than an ad for a product that claimed to be one of many on the market with that benefit ($F_{(1, 76)} = 3.00, p < .10$). However, and as anticipated by hypothesis 4, this result was qualified by the interactions described below.

Test of Hypotheses. Consistent with hypothesis 4, an interaction between self-efficacy and the number of products making a claim ($F_{(1,76)} = 4.79, p < .05$) indicated that when self-efficacy was high, consumers saw considerable differences in claim credibility when the product purported to be the only one on the market to provide the stated benefit ($M = 3.60$) compared to when it purported to be one of many ($M = 4.76; t_{(36)} = 9.97, p < .01$). These results support H4a. However, when self-efficacy was low, consumers did not appear to discriminate between products that claimed to be the only one on the market ($M = 4.65$) versus one of many ($M = 4.52; t_{(40)} = .09, p = ns$). These results support H4b.

For judgments of product effectiveness, a $2 \times 2 \times 2$ repeated measures ANOVA's using product relevance as the within-subjects factor yielded a main effect for product. Consumers judged the stain remover to be more effective ($M = 5.54$) than the memory booster ($M = 3.85; F_{(1,76)} = 91.98, p < .001$).

More central to the purpose of the study, an interaction between self-efficacy and product relevance ($F_{(1,76)} = 5.17, p < .05$) indicated that when the product was goal relevant and self-efficacy was low, consumers judged the relevant brand to be more effective ($M = 4.29$) than when self-efficacy was high ($M = 3.42; t_{(78)} = 6.00, p < .05$). This effect replicates hypothesis 3. When the product was not goal relevant, low and high self-efficacy consumers did not differ in judgments of the product's effectiveness (M 's = 5.57 and 5.51 for low and high efficacy consumers respectively; $t_{(78)} = .03, p = ns$). Since the *same consumers* evaluated the goal relevant and the non-goal relevant product, differences between these conditions suggest that the

results observed for hypothesis 3 in study one are due to self-efficacy and product relevance as opposed to individual difference factors like intelligence or logical reasoning capacity.

Contrasts between high and low efficacy consumers for the goal relevant product revealed that consumers in the high efficacy condition were able to discriminate between high and low credibility claims. That is, they regarded products that claimed to be the only one on the market with the purported benefit as having significantly less credible claims ($M = 2.53$) than products that claimed to be one of many on the market ($M = 3.53$); $t_{(36)} = 5.12, p < .05$). They also judged products that claimed to be the only one on the market as less effective than those that claimed to be one of many (M 's = 2.86 versus 3.94, $t_{(36)} = 5.23, p < .05$). These results support hypothesis 5a.

As predicted by hypothesis 5b, lower efficacy consumers did not discriminate between high and low credibility claims. If anything, they tended to view products that claimed to be the only one on the market as *more credible* ($M = 4.14$) than those that claimed to be one among many ($M = 3.60$), though this difference was not significant ($t_{(40)} = 0.88, p = ns$). Similar effects were observed for judgments of product effectiveness (M 's = 4.50 and 4.07 for one versus many products; $t_{(40)} = 0.54, p = ns$). These results also support hypothesis 5b.

Additional evidence linking self-efficacy to motivated reasoning was observed by examining whether perceived credibility of the claims mediates the relationship between self-efficacy and judgments of product effectiveness. A Sobel test was conducted for each of the four conditions (one versus many brands x stain remover versus memory booster) to examine the mediating role of perceived credibility on the self-efficacy-product effectiveness relationship. The manipulation check measure of self-efficacy was used as the independent variable in these analyses. As anticipated, perceived credibility mediated the impact of self-efficacy on judgments

of product effectiveness only under conditions where respondents were evaluating the goal relevant product (the brain booster) and the product was advertised as the only one on the market purporting to have a brain boosting benefit ($t = 2.09, p < .05$). Perceived credibility did not mediate the relationship between self-efficacy and product effectiveness in any of the remaining conditions.

Discussion

Study two replicates hypothesis 2 and 3 in study one and provides support for hypotheses 4 and 5. That is, when self efficacy is lower, consumers exposed to claims for a goal relevant product fail to discriminate between arguments that are high vs. low in credibility and hence do not differ in their judgments of the effectiveness of a product that uses high versus low credibility claims. The results also provide insight into the process by which reduced self-efficacy impacts judgments of a brand's effectiveness. Specifically, low self-efficacy leads to the desired conclusion that the product is effective because consumers perceive the product claims as credible. Although study one offered indirect evidence linking self-efficacy, credibility, and judgments of product effectiveness, study two provides more direct support for this explanation by both manipulating objective credibility (product as one vs. many on the market with the purported benefit) and demonstrating the mediating role of perceived credibility in the self-efficacy-perceived product effectiveness relationship.

Although studies one and two collectively provide support for several of the relationships suggested in Figure 1, two additional issues relevant to that Figure remain unexplored: (a) does self-efficacy impact the weight consumers assign to positive and negative information in forming evaluations and (b) does motivated reasoning act as a coping device to restore self-efficacy. Study three was designed to address these issues.

STUDY 3

Weight Assigned to Negative and Positive Information

A rather consistent finding in the literature is that consumers tend to weigh negative information more heavily than positive information because it is more diagnostic of product quality (e.g., Baumeister, Bratslavsky, Finkenauer and Vohs 2001; Rozin and Royzman 2001). Unfortunately, negative information about a product does not support the conclusion that one's goal can be attained through product use. Indeed, research on motivated reasoning shows that when people wish to arrive at a particular conclusion they place less weight on negative information that is at odds with the conclusion they wish to draw (Ahluwalia, et al., 2000). One reason consumers may give less weight to negative information when forming brand judgments is that they are motivated to find fault with it. This view is supported by research that shows that scrutiny and counter-argumentation of negative information is characteristic of motivated reasoning (Schaller 1992, Ditto and Lopez 1992; Kunda 1987). If negative information is more likely to be scrutinized and hence regarded as faulty or weak by low versus high efficacy consumers, they may give it less weight in their brand judgments.

Analogously, lower efficacy consumers may weigh positive information more heavily than their higher efficacy counterparts. Consistent with this idea, Edwards and Smith (1996) argue that people should terminate search earlier (i.e., be content with fewer pieces of information) when the information supports a desired conclusion (i.e., when it suggests that a goal is attainable) than when it does not. One reason for this is that additional search runs the risk of identifying information that does not support the desired conclusion. This logic would suggest

that when they are exposed to positive information, consumers whose self-efficacy is lower (versus higher) should search less for positive information before making a decision about the product's effectiveness than should higher efficacy consumers. In sum, we anticipate that:

H6: Compared to consumers whose perceived self-efficacy is higher, those for whom self-efficacy is reduced require (a) more pieces of negative information and (b) fewer pieces of positive information before deciding that they can judge product effectiveness.

Restored Self-Efficacy

Figure 1 suggests that the motivated reasoning process evoked by low self-efficacy consumers allows them to conclude that their goals *may actually be attainable* because there is a means (a product evaluated as effective) to help them achieve these goals. Such a belief should lessen anxiety over goal attainment, and suggest that control over the attainment of desirable goals is possible. These beliefs and perceptions should restore self-efficacy. Even if consumers conclude that a specific product is not effective, those for whom self-efficacy is reduced may find reassurance in the presence of a potential solution. They may infer from the presence of this product that even if this particular product is not effective there are others on the market or soon to be on the market that might facilitate goal attainment. At a minimum, the presence of a product on the market suggests that consumers' needs have been recognized by marketers, which suggests the potential for help in the future. This conclusion may restore a sense of self-efficacy. Following this logic we expect that if motivated reasoning serves as a coping mechanism:

H7: Exposure to a product that purports to facilitate goal attainment produces positive changes in perceived efficacy for consumers for whom self- efficacy was initially

threatened. This change in post-product exposure self-efficacy will not be observed for consumers for whom self-efficacy has not been threatened.

Design and Procedures

Study three was designed to test H6 and H7. One hundred and one undergraduate students participated in a 2 (high versus low perceived self-efficacy) x 2 (exposure to positive versus negative product information) between subjects factorial design study. Self-efficacy was manipulated in a manner identical to study one. As with study one, the salience and importance of the goal of getting good grades was aided by the fact that the study took place during exam week. Also consistent with study one, the manipulation check task was disguised as a separate study on student well being conducted by the Office of Student Affairs, with the items indicating self-efficacy embedded in the context of a larger body of items.

Participants were then told that they were involved in third study that had to do with evaluating a product that claimed to boost memory. The procedure for the experiment was adapted from Ditto and Lopez (1992). Respondents read the following instructions:

We want you to look at the available information one item at a time, and as soon as you feel that you have seen enough items to make a decision, press the “ready to decide” button. At that point you will decide whether the product is effective or not. We want you to make your decision based on as few of the items as possible, but at the same time enough to make a decision with a reasonable degree of accuracy.

Participants then proceeded to a computer screen that had two buttons: one to request an item of product information and another to indicate that they were ready to evaluate the product.

Information valence was manipulated by randomly assigning respondents to one of two conditions: a positive information only condition or a negative information only condition. In both conditions respondents could choose as many items of information as they deemed

necessary to form an evaluation. Unbeknownst to respondents, those in the positive valence condition only saw information that supported the product's effectiveness (positive information). Those in the negative valence condition saw only information that disputed the product's effectiveness (negative information). The set of matched product arguments used in this study (which differed in only in valence) is shown in Appendix B. Information presentation order was randomized. When participants believed that they had seen enough information to decide whether the product was or was not effective, they stopped the information search task and proceeded to a set of questions that asked them to evaluate the product. Finally, they responded to a set of items that assessed, among other things, their confidence in and capacity to earn a high GPA by the end of the term (post-product exposure self-efficacy).

Measures

Self-efficacy and Change in Efficacy. Self-efficacy was measured in a manner identical to study one. The first self-efficacy measure served as a manipulation check and hence reflected self-efficacy after exposure to the article (which was designed to manipulate perceived self efficacy) (for the two item measure $r = .65$). The second self-efficacy measure reflected self-efficacy after exposure to information about the product ($r = .61$ for the two item measure).

Information Search and Product Judgments. The weight given to positive and negative information was measured by a count of the number of pieces of information respondents used to determine that they could judge the product's effectiveness. Respondents were also asked to rate how effective they believed the product would be (1 = not at all effective; 9 = very effective) and how willing they would be to try it (- 4= not at all willing; +4 = very willing).

Results

Manipulation Checks. The self-efficacy manipulation was successful. A 2 x 2 ANOVA on the self-efficacy manipulation check measure revealed the expected main effect of self-efficacy ($F_{(1, 98)} = 17.72, p < .001$). Respondents in the reduced self-efficacy condition felt significantly lower efficacy related to getting good grades by the end of the semester ($M = 6.35$) than did respondents in the higher self-efficacy condition ($M = 7.40$). The results did not vary by information condition.

Number of Pieces of Information Searched. To test hypothesis 6, a 2 (self-efficacy) x 2 (information valence) between subjects ANOVA was conducted using the number of pieces of information that respondents in the positive and negative information conditions respectively examined before they felt they could judge the product's effectiveness. This analysis produced a main effect for valence ($F_{1, 98} = 10.40, p < .01$), and a significant valence by efficacy interaction ($F = 4.59, p < .05$). The valence main effect indicated that respondents in the positive information condition examined more pieces of information ($M = 8.08$) than did respondents in the negative information condition ($M = 4.86$).

Most relevant to hypothesis 6 is the valence x self-efficacy interaction. Analysis of the simple main effects of the interaction revealed that respondents in the reduced self-efficacy condition examined significantly more pieces of negative information before they felt they could judge product effectiveness ($M = 6.88$) than did those in the higher self-efficacy condition ($M = 2.85$). These results support hypothesis 6a. Hypothesis 6b was not supported; reduced self-efficacy consumers did not search for less positive information than higher efficacy consumers before judging the effectiveness of the product ($M = 7.96$ and 8.21 , respectively - see Table 2).

Insert Table 2 here

Judgments of Brand Effectiveness. Prior research on the negativity effect (e.g., the finding that negative information is more diagnostic and is weighted more heavily in product evaluation judgments) would suggest that the respondents in the reduced efficacy - negative information condition would have the most negative brand attitudes and be least willing to try the product since they examined of the most pieces of negative information (see Table 2). However, this effect was not observed. Rather, a 2 x 2 between subjects ANOVA on consumers' willingness to try to the product produced a main effect for valence ($F_{(1, 98)} = 96.01, p < .001$), a main effect for self-efficacy ($F = 11.95; p < .001$), and a significant interaction effect ($F_{(1, 98)} = 4.31, p < .05$).

As expected, respondents exposed to positive information were more willing to try the product ($M = 1.44$) than subjects exposed to negative information ($M = -1.90$). More relevant is the main effect of self-efficacy. Subjects for whom self-efficacy had been threatened were significantly more willing to try the product ($M = .36$) than consumers in the higher self-efficacy condition ($M = -.82$). These findings once again support hypothesis 3.

Analysis of the simple main effects associated with the interaction indicated that the difference between the lower and higher self-efficacy consumers in their willingness to try the product was particularly large when respondents were exposed to negative information ($M = -.96$ and -2.85 , respectively) as opposed to positive information ($M = 1.68$ versus 1.21 for low and high efficacy respectively). This pattern of effects was replicated for consumers' evaluations of the product's effectiveness (see Table 2). Interestingly then, even though reduced efficacy respondents were exposed to more negative information they had more favorable judgments of the brand's effectiveness and were more willing to try the product than higher efficacy

consumers. These results are clearly consistent with the idea that lower efficacy consumers place less weight on negative information than do higher efficacy consumers.

Change in Perceived Efficacy Following Product Exposure. Hypothesis 7 proposed that exposure to a goal-relevant product would restore reduced efficacy consumers' sense of efficacy. This hypothesis was tested by computing a difference score in perceived self-efficacy before versus after exposure to the product. A 2 x 2 between subjects ANOVA of this difference score revealed a significant main effect for self-efficacy ($F_{(1, 98)} = 7.92, p < .01$). Marginal means indicated that respondents in the lower self-efficacy condition experienced a significantly greater positive change in perceived self-efficacy ($M = .43$) than did respondents in the higher self-efficacy condition ($M = .04$). Interestingly, this effect did not depend on whether consumers were exposed to negative or positive information. A change in self-efficacy was observed even among lower efficacy consumers who were exposed to negative information about the product. These results are consistent with hypothesis 6 and further suggest that when self-efficacy is low, consumers weight product disconfirming evidence less heavily in product judgments.

Discussion

The findings of study three demonstrate that when self-efficacy is reduced, consumers weigh the information that they gather differently from their higher efficacy counterparts. In particular, respondents for whom self-efficacy is threatened require more pieces of negative information than their high self-efficacy counterparts before they are willing to make a judgment about the product's effectiveness. Moreover, even though they gather more negative information than their higher efficacy counterparts they have more favorable judgments of the product's effectiveness and are more willing to try it. The negativity bias that has been observed in other settings does not appear to operate under conditions of motivated reasoning. The findings of the

study are consistent with an explanation that motivated reasoning operates through discounting of negative information about a goal relevant product rather than through a process that gives greater weight to positive information about the product. In addition, mere exposure to a goal-relevant product seems to enhance lower efficacy consumers' perceived self-efficacy, even when they are exposed to only negative information.

Notably, although we had anticipated that low efficacy consumers would require less positive information before making a judgment (suggesting that they give positive information greater weight), high and low efficacy gathered equal amounts of positive information about the product before deciding that they could render a judgment regarding its effectiveness. It is possible that different factors influence search and use of positive information. When self-efficacy is low, positive information about the product is reinforcing. More positive information provides greater assurance that the goal can be attained via a marketplace means. Desire for such assurance may drive the search for positive information. In contrast, high efficacy consumers may search for more positive information for a different reason—they weigh it less heavily in judgments and hence require more such information before rendering an opinion.

GENERAL DISCUSSION

The present article makes several contributions. First, it identifies an important and novel antecedent to motivated reasoning—threats to self-efficacy. We surmise that one reason *why* motivated reasoning occurs is that threats to self-efficacy are anxiety producing and induce a sense of loss of control over goal attainment. In order to restore feelings of control, consumers

need to conclude that their goal can be attained through a goal-enabling product. That conclusion can be rendered if consumers engage in motivated reasoning of product information.

Second, we add to a growing body of evidence that identifies motivated reasoning as a distinct process that has unique effects on information search, information use, and decision-making. The studies here demonstrate that reduced self-efficacy impacts (a) *where* consumers search for information (from product favorable versus objective sources), (b) *how* they evaluate it (as credible), (c) *whether* they distinguish between high versus low credibility arguments, (d) *how much* information they require before rendering a judgment about a goal-relevant product, and (e) *what* conclusions they draw about the product's likely effectiveness.

Third, we make a unique contribution to the self-efficacy literature by showing that one factor facilitating restored self-efficacy is motivated reasoning. Motivated reasoning is thus a coping mechanism for dealing with threatened self-efficacy.

Theoretical Implications. Similar to high levels of objective information processing, motivated reasoning shares motivation and a diligent attention to the processing of information. However, motivated reasoning differs from objective processing in the processing of goal relevant information (assessing true merits versus reaching a desired conclusion) and hence in the type of information sought and examined during processing. Like objective processing, the valence of information is relevant to motivated reasoning. However, the two processes appear to differ in their focus on negative versus positive information. Past work finds that negative information is more attention getting and given greater weight in decision-making. In contrast, we observed that reduced self-efficacy prompts a search for hypothesis confirming information and involves a tendency to weight hypothesis inconsistent information less heavily.

Although research has focused on such goal dimensions as relevance and importance, we add to the goals literature by suggesting an under researched dimension—attainability (Austin and Vancouver 1996). When self-efficacy is low, consumers' goals are threatened—impacting a desire to see goals as attainable. Guided by this motivation, consumers devise cognitive processing strategies and generate beliefs that enable them to conclude that purchase and consumption behavior is conducive to goal attainment.

Finally, this research highlights the importance of self-efficacy as a construct relevant to consumption. The role of self-efficacy in directing behavior, though widely recognized in psychology, has received scant attention in the consumer behavior literature. In that context, the linkage between self-efficacy and motivated reasoning suggests that consumers may acquire and use some products because they provide the illusion of control even if they do not provide or have a low probability of providing the stated or implied benefit. Weight loss products, alternative medicines, and dietary supplements, are examples of product categories for which low self-efficacy may be relevant and for which this illusion of control may be highly prevalent.

Pragmatic Implications. The present article also has important implications for understanding consumers' marketplace behaviors. The dominant paradigms related to information use and decision-making in both economics and psychology suggest that consumers will be well informed and will make the correct, objective decision if (a) information is fully disclosed in a meaningful way and (b) consumers have the motivation, ability and opportunity to process it. This view has guided much of the practice and regulation related to labeling, disclosures and warnings (Stewart and Martin 1994, 2004). The findings here suggest that information disclosure alone need not culminate in objectively correct choices even when the information is meaningful and consumers process it. Disclaimers such as “not evaluated by the

FDA” or warnings about possible side effects may not have the intended effects. Public service announcements, warnings and other disclaimers may need to account for the lower “weight” placed by consumers on preference-inconsistent information.

At the same time, there is a need to appreciate the important role that coping behavior, like motivated reasoning, plays in creating a sense of control and in maintaining motivation to achieve a specific goal. Disclosures designed to compensate for consumers’ tendency to engage in motivated reasoning in specific situations may have unintended consequences related to increased anxiety and a sense of helplessness.

If generalizable, the results of this research suggest that lack of consumer sophistication and unethical marketing practices are not always the culprits in ill-advised consumption practices. Instead, threatened self-efficacy regarding the attainment of an important goal may induce a state of situational vulnerability. Given the many factors that may threaten self-efficacy (Bandura 2000), even well educated and sophisticated consumers may be subject to such situational vulnerability. To protect “situationally vulnerable” consumers, marketers and policy-makers need to understand that vulnerability need not be limited to consumer traits like physical or mental competency or sophistication. Rather it may extend to situational factors that are particular to the consumer.

Limitations and Future Research. The limitations of these studies offer considerable opportunities for future research. First, although the present research finds that the impact of self-efficacy on judgments of product effectiveness is driven by biased perceptions of argument credibility, additional study of the processing mechanisms by which consumers form their desired conclusion is necessary. Future research that examines process measures, such as thought listing and reaction time, could be especially helpful in highlighting process mechanisms.

Second, additional research is necessary to understand factors that may minimize or magnify the impact of self-efficacy on motivated reasoning when this situational vulnerability is induced. Future research that bounds the conditions under which motivated reasoning occurs would be especially helpful. It would be useful to identify alternative coping strategies or means for modifying cognitive processes to reduce the biases associated with motivated reasoning without unintended consequences related to healthy coping by the consumer. For example, do elements of advertising execution like modeling or supportive claims that “you can do it” enhance or reduce the effect of self-efficacy on motivated reasoning. Similarly, if the focus of control or goal attainment is shifted from the product to the person, is perceived self-efficacy enhanced, and the need to rely on weak product information reduced? Under what circumstances and through what means might such a change in focus take place?

Third, research on the link between self-efficacy, hope and motivated reasoning is warranted. MacInnis and de Mello (2005) argue that when consumers hope to achieve a goal relevant outcome they engage in motivated reasoning. Hope is an emotion that is created when consumers yearn for an uncertain but goal relevant outcome. Self-efficacy reduction may induce hope, not by increasing yearning but rather by creating uncertainty in an outcome they yearn for.

Finally, additional research might further examine the process by which motivated reasoning restores self-efficacy. The theoretical arguments underlying hypothesis 7 were that motivated reasoning reduces anxiety, induces hopefulness and provides a sense of control over goal attainment by suggesting the availability of a relevant external marketplace means to goal attainment. However, we did not examine anxiety, hopefulness, or perceptions of control as mediators of the motivated reasoning-self-efficacy restoration. Further research on the process mechanisms underlying the motivated reasoning-self efficacy link is warranted.

The present article illuminates an important and infrequently examined dimension of consumer behavior. Consumer behavior is driven by goals, and many products and services are purchased and consumed in the service of these goals. The proposition that threats to the attainment of important goals induce information processing mechanisms that support perceived goal attainment represents a rich domain for future research.

Appendix A Manipulation of Low (High) Perceived Self-efficacy

Reading comprehension study

The present study looks at how easy or difficult it is to read, understand and remember certain types of articles and some kinds of writing styles. Also, we are interested in learning how the writing style determines how enjoyable it is to read an academic article. The following is an excerpt from an article published in the *Journal of Educational Psychology*. We ask you to read it carefully, and once you're done, to answer a few questions about your opinion of the article.

(beginning of article excerpt)

Recent research in cognitive psychology has looked at the effects of stress, workload, and work pressure on the individual's performance on a variety of intellectual tasks, such as reasoning, memorization, and problem solving skills.

The results are quite surprising, in that factors like stress, workload, and pressure are as predictive of intellectual performance as intelligence itself. That is, human performance on tasks dealing with reasoning, memorization and problem-solving depends as much on external factors such as environmental stress, amount of workload, and the pressure of the work, as in internal factors such as IQ.

*In particular, the studies show that under conditions of high stress, heavy workload, and high pressure, individuals tend to perform **worse (better)** in intellectual tasks dealing with memorization, reasoning, and problem-solving. Under conditions of stress, heavy workload, and high demands, memory is **impaired (enhanced)**, reasoning becomes **(easier) more difficult**, and problem-solving takes **longer (less time)** and leads to **more (fewer)** errors. This seems to be due to the fact that the brain reacts to stress and pressure **by shutting down (opening up)** neural paths, and making communications among neurons **slower (faster)** and **less (more)** efficient.*

These findings are very important in that they shed light on how the brain functions, and provide insights into how humans operate under stressful conditions.

Bold-faced and underlined text added here for ease of exposition.

Appendix B
Favorable and Unfavorable Product Arguments for Memory Booster
Used in Study 3

Favorable	Unfavorable
Effective in more than 50% of cases	Ineffective in less than 50% of cases
About 8 out of 10 users never experienced side effects	About 8 out of 10 users experience side effects at some point
Some laboratory studies have confirmed that the ingredient Acetyl-L-Carnitine may enhance mental alertness.	No laboratory studies have confirmed whether the ingredient Acetyl-L-Carnitine enhances mental alertness.
Research suggests that P-Serine, contained in this product, slows down the aging of nerve cells.	Research suggests that P-Serine, contained in this product, does not slow down the aging of nerve cells.
Its ingredients are digested very quickly, so they are rapidly transported by the blood to nourish the brain and nerve cells.	Its ingredients are digested too slowly, so they may not be transported by the blood fast enough to nourish the brain and nerve cells.
Some studies suggest that the active ingredients repair damaged neurons.	No studies so far suggest that the active ingredients repair damaged neurons.
It contains sage oil. Laboratory experiments indicate that it may improve short- and long-term memory.	It contains sage oil. Laboratory experiments do not indicate that it may improve short- and long-term memory.
Research shows that it may promote the production of acetylcholine, which maintains healthy functioning of the brain.	Research hasn't shown whether it promotes the production of acetylcholine, which maintains healthy functioning of the brain.
The results can be noticed rapidly: some individuals report noticeable improvements in as little as 2 days of use.	The results seem not to be noticed rapidly: some individuals report no noticeable improvements even after several weeks of use.
The ingredient Acetyl-L-Carnitine has been shown to prevent and relieve symptoms of depression, promoting healthy mood levels.	The ingredient Acetyl-L-Carnitine has not yet been shown to prevent or relieve symptoms of depression, or to promote healthy mood levels.
It contains the recommended allowance of vitamins and minerals that promote mental focus.	It contains less than the recommended allowance of vitamins and minerals that promote mental focus.
Some research suggests that the Gingko Biloba contained in this product enhances communication between brain cells and leads to improved reasoning skills.	No research suggests that the Gingko Biloba contained in this product enhances communication between brain cells or leads to improved reasoning skills.
It contains antioxidants that repair and help prevent cell aging and damage.	It does not contain the antioxidants that repair and help prevent cell aging and damage.
An experiment showed a performance improvement between individuals who took this product and those who took a placebo.	An experiment showed no difference in performance improvement between individuals who took this product and those who took a placebo.
Tests show that the product doesn't cause allergic reactions.	Certain individuals may be allergic to some of the ingredients in this product.
It contains ginseng. Research suggests that this ingredient acts as an energy and mental enhancer.	It contains ginseng. Research has not shown whether this ingredient acts as an energy or mental enhancer.
The vitamin B Complex in this product	The vitamin B Complex in this product is below

Appendix B
Favorable and Unfavorable Product Arguments for Memory Booster
Used in Study 3

Favorable	Unfavorable
enhances learning ability and attention span. It has an Ayurvedic formulation, which cleanses toxins from the system	recommended allowance levels. It has an Ayurvedic formulation, but studies haven't confirmed whether it cleanses toxins from the system
Studies show that Gingko Biloba enhances communication between brain cells and leads to improved reasoning skills.	Studies have failed to show whether Gingko Biloba enhances communication between brain cells or leads to improved reasoning skills.
Experiments showed that the berry extract in this product improves the flow of oxygen to the brain	Although the berry extract in this product may improve the flow of oxygen to the brain, some individuals may be allergic to it
The minerals and vitamins in this product can significantly prevent cognitive decline and improve mental acuity, according to research	The minerals and vitamins in this product cannot significantly prevent cognitive decline or improve mental acuity, acuity, according to research
Willow bark is well known for its ability to increase the oxygen intake of brain cells.	Willow bark in this product has not shown any ability to increase the oxygen intake of brain cells.
Research showed that the herbal supplement Brahmi contained in this product improves memory and alertness	Research has not shown that the herbal supplement Brahmi contained in this product improves memory or alertness in any way
It contains gotu kola, which staves off memory deterioration, according to research	It contains gotu kola, but this ingredient did not stop memory deterioration in many laboratory studies.
DMAE in this product can elevate one's alertness and boost cognitive functions, according to many studies	DMAE in this product may not be effective in elevating one's alertness or boosting cognitive functions, according to many studies
Blind tests have shown that Gingko increases mental focus and clarity	Blind tests have failed to show that Gingko increases mental focus or clarity
Coenzyme Q-10, contained in this product, is used by all cells to produce ATP, which gives energy to brain cells	Studies have not been able to confirm whether coenzyme Q-10 in this product increases brain cell energy
The ingredient inositol increases the production of neurotransmitters and leads to improved brain functioning.	The ingredient inositol has not been proved effective to increase production of neurotransmitters or lead to improved performance, according to studies
The DHEA in this product has been shown to improve cognitive functioning in several laboratory tests	The DHEA in this product was not effective in improving cognitive functioning in several laboratory tests
Taurine, contained in this product, is an activator of the cerebral metabolism and other benefits, according to tests	Taurine, contained in this product did not show any effects in activating cerebral metabolism or other benefits, according to tests

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Dependent Variable	Efficacy Condition	Means	t
Total Information Searched from Brochure	Reduced efficacy	8.35	4.40*
	Heightened efficacy	6.4	
Total Information Searched from Newspaper Article	Reduced efficacy	6.77	0.38
	Heightened efficacy	5.96	
Credibility of the Product's claims	Reduced efficacy	4.61	5.07*
	Heightened efficacy	3.86	
Perceived Product Effectiveness	Reduced efficacy	4.49	5.67*
	Heightened efficacy	3.74	
^a = p< .10			
*= p< .05			
** p< .01			
*** p< .001			

Table 2: The Impact of Perceived Agency and Valence of Information Exposure on Information Search and Product Evaluation: Study 3

Dependent Variable	Information Condition	Self-Efficacy Condition	Means	Main Effects		Interaction
				Self-Efficacy (F)	Information Valence (F)	Self Efficacy x Information Valence (F)
Number of Pieces of Product Information Searched	Favorable	Reduced	7.96	3.58+	10.40***	4.59*
		Heightened	8.21			
	Unfavorable	Reduced	6.88			
		Heightened	2.85			
Evaluation of Product as "worth a try" (minus 4= definitely not worth a try; +4= definitely worth a try)	Favorable	Reduced	1.68	11.95**	94.60***	4.31*
		Heightened	1.21			
	Unfavorable	Reduced	-0.96			
		Heightened	-2.85			
Perceived Product Effectiveness (1= not at all effective; 9= very effective)	Favorable	Reduced	6.52	7.46 **	160.89***	3.44*
		Heightened	6.25			
	Unfavorable	Reduced	3.52			
		Heightened	2.00			

^a = p < .10

* = p < .05

** = p < .01

*** = p < .001

Figure 1: Conceptual Model

