Need for Cognitive Closure and Information Search Strategy

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ABSTRACT

The authors investigated whether need for cognitive closure (NFCC) affected one's style of information search (attribute-based search vs. alternative-based search) in consumer choice. There has been growing interest in NFCC in marketing and its relationship to consumer information processing. However, no study to date has examined the different information search strategies that consumers employ when they (1) possess different levels of NFCC or (2) are exposed to situations that evoke more or less NFCC. Across two studies where Study 1 measured NFCC while Study 2 manipulated NFCC, the authors commonly found that higher NFCC compared to lower NFCC resulted in (1) a greater preference for the attribute-based search over the alternative-based search and (2) a consideration of a smaller amount of information to make a final choice. Implications for consumer information processing and sales strategies are discussed along with future research directions. © 2008 Wiley Periodicals, Inc.

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Consumers in today's business environment are confronted with information overload, increasing the demand and pressure to alleviate cognitive load. This is especially true as consumers are pressed for time to process significant amounts of information and make decisions. Thus, the utilization of attribute-based processing over alternative-based processing is likely to increase due to its simplicity and promptness in arriving at a final decision. The authors will discuss what the two strategies are in the section to follow. Consequently, it becomes critically important to understand what prompts consumers from an individual trait perspective to engage in attribute-based processing over alternative-based processing. The goal of this paper is to address this issue using the concept of need for cognitive closure.

Suppose you want to choose a car from three alternatives, and you decide to consider three attributes for each car. Will you examine all three attributes of a car and then move on to the next car or examine all the cars for a given attribute and then move on to the next attribute? The former search strategy has been referred to as the alternative-based search, while the latter approach has been labeled the attribute-based search strategy (Payne, 1976). The nature and the outcome of one's consumer decision vary greatly depending on which search strategy one adopts; this is discusssed later. The goal of the present paper is to examine whether one's search strategy is affected by one's need for cognitive closure (henceforth referred to as NFCC; Kruglanski, 1989). Specifically, we examine whether high NFCC, compared to low NFCC, is associated more with the attribute-based search than the alternative-based search. To the best of the authors' knowledge, the marketing literature has examined the attribute-based and alternative-based search strategies and the NFCC concept in isolation. What is missing is a study that examines the two together. This research attempts to address this void in the extant literature.

The relationship between having a higher need for cognitive closure and preference for attribute-based processing over alternative-based processing suggests that firms must not only identify the most important attribute consumers consider in making a choice but also develop the capability to excel in that particular attribute. Conversely, if consumers express a preference for alternative- over attribute-based processing, firms then need to take a more balanced approach in developing attributes. However, this is simply not feasible when consumers rely on attribute-based processing. Therefore, from a marketing perspective, understanding the contexts that evoke need for cognitive closure to varying degrees is critical in developing consumer behavior strategies.

Apart from consumer information processing, the notion of need for cognitive closure has numerous applications in marketing that range from sales personnel's approach toward sales transactions to innovative and creative new product development. Because people with a high need for cognitive closure tend to search for less information, the possibility of reaching an optimal solution may be missed. Thus, the stake for a sub-optimal decision is high when those involved in the decision making have a high need for cognitive closure.

In the sections to follow, the authors will first discuss the concept of NFCC and the two different information search strategies, and then report the results of two experiments that tested the relationship between one's NFCC and the information search strategy. Finally, the authors conclude with theoretical and practical implications, along with limitations and future research directions.

NEED FOR COGNITIVE CLOSURE

NFCC is defined as the desire for a firm answer to a question, as opposed to uncertainty, ambiguity, or confusion (Kruglanski, 1989). When faced with a judgment situation, individuals with high NFCC are more likely than those with low NFCC to make a quick, firm, and final decision. Those with high NFCC are also less tolerant of uncertainty and ambiguity and hence are more inclined to act promptly than those with low NFCC. Therefore, the former quickly *seize* on information that affords closure, and then *freeze* on closure once it has been reached.

NFCC varies not only across individuals but also across situations. The tendency toward cognitive closure is elevated in situations in which the importance of action looms large, such as under time constraint (Kardes et al., 2004; Kruglanski & Freund, 1983; Shah, Kruglanski, & Thompson, 1998), mental fatigue (Webster, Richter, & Kruglanski, 1996), or alcohol intoxication (Webster & Kruglanski, 1994a). For example, people are more inclined to draw conclusions and avoid uncertainty and ambiguity under time pressure than they would be otherwise.

Whether evoked situationally or measured as an individual difference, high NFCC causes people to ignore multiple perspectives to a given issue and to stick to the initial conclusion without sufficient adjustment (i.e., permanency striving). Therefore, certain types of judgmental biases that arise largely due to insufficient adjustment are particularly aggravated under high NFCC. For example, the correspondence bias in causal attribution, which arises because of insufficient situational correction for initial dispositional inference, is particularly likely among those with high NFCC or under high NFCC situations such as time pressure (Webster, 1993). Social stereotyping is another example (Kruglanski & Freund, 1983). Since stereotypical processing about an individual occurs in part because people seize on the group membership information of the individual without paying sufficient attention to the personal, individuating details of the individual, those with high (vs. low) NFCC or those under high (vs. low) NFCC situations are more vulnerable to stereotypic processing.

This seize–freeze pattern of high NFCC has been examined not only in psychological literature but also in consumer behavior literature (for a comprehensive review, see Kruglanski, 2004; Kruglanski & Webster, 1996; Vermeir, Van Kenhove, & Hendrickx, 2002). For example, marketing research has shown that the inclination to freeze captures the tendency of individuals to engage in permanency by preferring knowledge or products that have multifinality, the ability to satisfy multiple goals with a single means, or products that can be applied across different situational contexts. The pursuit of multifinality in consumer behavior among those with high NFCC has been observed in various other studies. For instance, Chun and colleagues (2005, Study 2) found support for the proposition that individuals with high NFCC sacrificed product quality to obtain multifinality more than those with low NFCC. In other words, they were willing to give up product quality for goal quantity. Chun and colleagues (2005, Study 3) also reported that those with high NFCC compared to their counterparts were less price sensitive or, put differently, were willing to pay more to satisfy multifinality.

The relationships between NFCC and advertising (Zhang, Kardes, & Cronley, 2002) and between NFCC and consideration set overvaluation (Kardes et al., 2002) have also been examined. The consequence of alignability in comparative ad

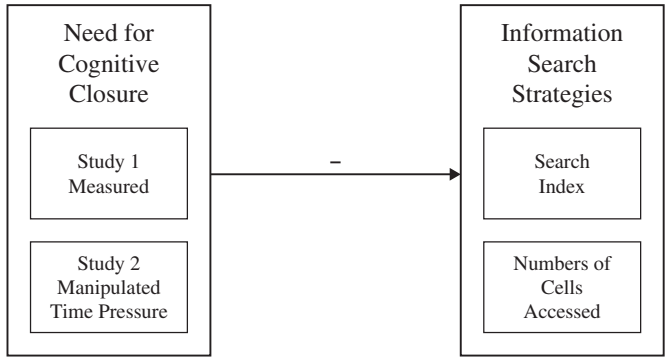

Figure 1. Conceptual Model.

evaluations has been shown to be more pronounced for high-NFCC individuals. More specifically, those with high (vs. low) NFCC showed a lower evaluation of the target brand as alignability in comparative ads decreased (Zhang, Kardes, & Cronley, 2002, Study 3). Furthermore, according to Kardes et al. (2002), NFCC moderated the effect of consideration set evaluation processes on choice deferral in that more choice deferral was found in comparative (vs. singular) judgment tasks under low (vs. high) NFCC.

The common theme in all these studies is that those with high (vs. low) NFCC or under high (vs. low) NFCC situations prefer to consider a smaller amount of information before making final decisions (e.g., Ford & Kruglanski, 1995; Houghton & Grewal 2000; Mayseless & Kruglanski, 1987; Webster, Richter, & Kruglanski, 1996). That is, the amount of information people utilize differs depending on one's chronic or temporal level of NFCC (Vermeir & Van Kenhove, 2005). However, the previous studies are relatively silent on the way people with high versus low NFCC gather information or engage in information search strategy. Most past research put participants into a situation in which all relevant information was already given and examined as to whether and how NFCC affected the way participants dealt with the given information. For example, research has focused on whether/how NFCC affected the relative weights an individual assigned to each of two pieces of information already provided by an experimenter, such as stereotypic information vs. individuating information or situational information vs. dispositional information (Kruglanski & Freund, 1983; Webster, 1993). However, it has yet to be demonstrated whether the way people search for and acquire information in a situation in which relevant information is *not* given is affected by NFCC. In this respect, this study is different from past studies. Figure 1 illustrates the conceptual model of this study.

INFORMATION SEARCH STRATEGIES

Which strategy one chooses between the alternative-based and the attribute-based is closely related to one's decision rule. If one applies a so-called compensatory rule, one is more likely to adopt the alternative-based search than the attribute-based search. However, if one applies a non-compensatory rule, one is more likely to use the attribute-based search over the alternative-based search (Abelson & Levi, 1985; Klayman, 1983; Payne, Bettman, & Johnson, 1988).

A compensatory rule involves trade-offs between attributes, thus allowing compensation for weakness on one dimension to be made up by strength on another. Specifically, decision makers make the final decision depending on each alternative's balance of values on all attributes considered. Therefore, a chosen alternative based on a compensatory rule is superior to the other alternatives in the sum of the weighted utilities of all the attributes considered.

On the other hand, a non-compensatory rule maintains that a chosen alternative is superior to the other alternatives only by virtue of its most important attribute(s). A non-compensatory rule states that the strength on one dimension cannot compensate for the weakness on another. For example, if an alternative has a lower value than a threshold for one attribute, the alternative is eliminated from further consideration even though the alternative may have the highest additive-sum value among all options. Therefore, it is commonly argued that a non-compensatory rule seeks not the best choice but a "good enough" choice, and hence it is regarded as less rational than a compensatory rule. A non-compensatory rule is well represented by models such as the conjunctive, the disjunctive, the elimination by aspects strategy (Tversky, 1972), and the lexicographic rule (Svenson, 1979).

Compensatory and non-compensatory rules are different not only in the final decision outcome but also in the nature of the decision-making process. Compensatory rules are *conflict-confronting* by nature, since one makes a choice by considering all attributes and trades off each alternative's weakness with a strength. By contrast, non-compensatory rules are *conflict-avoiding*, since one focuses only on the attribute(s) considered to be the most important and compares all alternatives on that dimension only (Hogarth, 1987). Since trade-offs cause cognitive and emotional difficulties (Kottemann & Davis, 1991), compensatory rules require much cognitive effort as compared to non-compensatory ones (Janis & Mann, 1977).

THE PRESENT RESEARCH

Taking the above into consideration, it is posited that a consumer's NFCC will determine which decision rules to use, which, in turn, affects the type of information strategy deployed. More specifically, it is proposed that high NFCC (vs. low NFCC) would be associated more with non-compensatory rules and the attribute-based search rather than compensatory rules and the alternative-based search because high NFCC seeks quick, unambiguous, and final answers, which do not entail much cognitive and emotional effort or conflict. Individuals with high NFCC tend to prefer information processes that require low (not high) cognitive effort, generate few (not many) competing alternatives, and promote a sense of closure (not uncertainty). In contrast, those with low NFCC would not be bothered by information processes that require high cognitive effort, generate multiple alternatives, and often lead to uncertain solutions. Therefore, they would be less likely than those with high NFCC to engage in the attribute-based search.

Two studies were conducted to test this hypothesis. In Study 1, the relationship between chronic individual differences in NFCC and the information search strategy (attribute-based vs. alternative-based) pursued were examined. In Study 2, NFCC was manipulated (vs. measured as done in Study 1) by time

pressure, and its effects on the information search strategy chosen were investigated. Formally, this study attempts to test the following hypotheses:

H1a: The extent to which individuals follow an attribute-based strategy over an alternative-based strategy will be more pronounced for high-NFCC subjects as compared to low-NFCC subjects.

H1b: The total amount of information accessed will be less for individuals with high (vs. low) NFCC.

STUDY 1

The purpose of Study 1 was to investigate whether NFCC would make a difference in the information search strategy pursued by individuals. To achieve this purpose, a choice task was employed, which was basically similar to that of Chu, Spires, and Sueyoshi (1999). Participants were requested to select the most preferred item from a set of alternatives in three product categories—mobile phone, laptop computer, and digital camera. Each choice set was sequentially displayed in the alternatives $\times$ attributes matrix form on a computer screen. Initially, all cells were blank, so that participants had to click a cell in order to see the value of a specific attribute of a specific alternative. They could access as many cells as they thought necessary to make a final choice. They made final choices for each product category once they thought they had considered enough information. This task was virtually identical to the so-called MOUSELAB methodology (Johnson et al., 1986) except that, unlike the MOUSELAB, this task did not measure the "time" each participant spent on each "cell."

In the present study, the individual difference of NFCC was measured by the Need for Closure Scale (NFCS) developed by Webster and Kruglanski (1994b). Using the median split, participants were classified into two groups: high-NFCC group and low-NFCC group. It was expected that high (vs. low) NFCC participants to use more of the attribute-based search over the alternative-based search in making their choice. Results of Study 1 are displayed in Table 1.

Method

Stimulus Product Categories. A pretest was performed to select appropriate stimulus product categories for the present research. Twenty undergraduates students at Seoul National University participated in the pretest. Participants were provided with nine product categories (laptop computer, calculator, dishwasher, video game console, mobile phone, digital camera, automobile, PDA, and golf clubs) and asked to indicate their familiarity with each of them. They also rated the relevance of each category to their life. Specifically, they were asked the following four questions: "How important is _____ for you?," "How relevant is ____ to you?," "How knowledgeable are you about_____?," and "How familiar are you with _____?" All questions were answered on 7-point Likert scales. Since the Cronbach's alpha of the participants' responses to the four questions exceeded 0.90, the average score was used as an index of overall relevance. The top three product categories in terms of overall relevance were

selected—mobile phone (5.86), digital camera (4.63), and laptop computer (4.46). There was no gender difference in the overall relevance score for the three categories, $t < 1$.

Participants. Participants were 77 introductory psychology students at a large university. They received partial course credit for their participation. Since there was no gender effect in Studies 1 and 2, it will not be discussed further in the analysis.

Procedure. On arriving at the laboratory in groups of 5 to 7, participants were separately seated in front of a personal computer where the task window was already opened. Participants were told that the study was intended to investigate consumer choice and that they would be asked to make a choice for three product categories (e.g., mobile phone, laptop computer, and digital camera). Each choice set was presented on a computer screen in the form of a 12 (alternatives) $\times$ 7 (attributes) matrix, as illustrated in Figure 2. The seven attributes of each product were selected to represent the features of each product that customers typically deemed important. For example, when participants were asked to make a choice for a laptop computer, the following seven attributes were presented: CPU, PRICE, HDD, DESIGN, CD-ROM, MEMORY, and WEIGHT. Moreover, the attribute values were carefully assigned so that a certain alternative did not dominate all the others on all attributes. The possible range of attribute levels varied from two to five across all attributes. For instance, a laptop computer's CPU had four possible levels—933MHZ, 1.2GHZ, 1.6GHZ, and 1.8GHZ, whereas a laptop computer's design had five levels—very bad, bad, average, good, and very good.

Although each cell in the matrix contained an attribute's value for a particular alternative, all cells were hidden at the outset. To access the value of a certain attribute of a certain alternative, participants had to click the cell. Participants could open as many cells as they thought necessary for making a final choice. Once they thought they were ready for their final choice, they were to

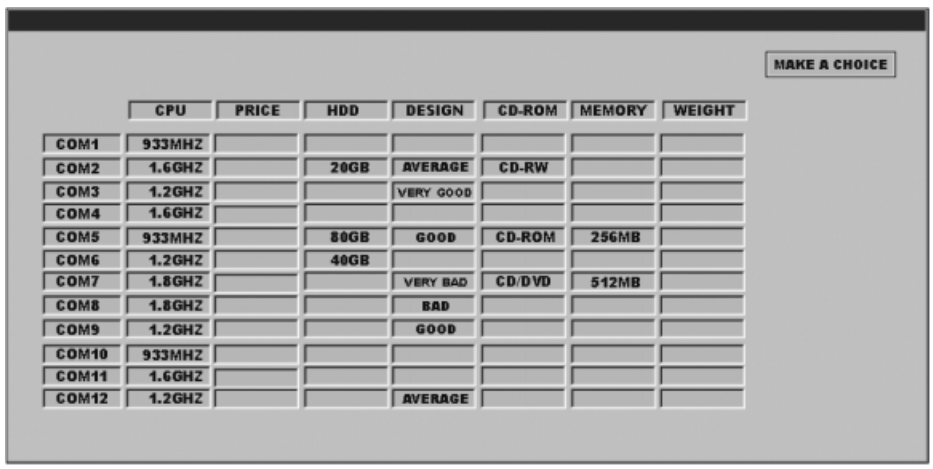

Figure 2. An Example of the 12 (alternatives) $\times$ 7 (attributes) Matrix.

click a "MAKE A CHOICE" button, which led them to a pop-up window where they could record their final choice. The computer program recorded all the actions of each participant, including the sequence and the number of clicked cells.

To familiarize participants with the task, participants were offered a practice trial in which they chose one car out of the 12 available with seven attributes. The practice task was identical to the target task except that all attributes had only three possible levels (i.e., bad, average, and good).

NFCC Measurement. Participants' need for cognitive closures was measured via a translated version of the Need for Closure Scale (NFCS; Webster & Kruglanski, 1994b). The translation was made following the standard translation–back translation method in cross-cultural research to ensure the equivalence of meanings (Brislin, 1970). The invariance of the factor structure of the NFCS across cultures, including Korea, has been demonstrated by Krugranski and his colleagues (Kossowska et al., 2002). The researchers concluded that the NFCS has the same basic meaning and structure cross nationally, and ratings can be meaningfully compared across countries, including Korea.

The NFCS is a 42-item self-report instrument that requires respondents to rate the extent to which they agree with statements reflecting a preference either for closure or for a desire to avoid closure. Like the participants in the original Webster and Kruglanksi study (1994b), participants in this study also rated each item on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). Sample items were as follows:

- I think that having clear rules and order at work is essential for success.
- I tend to put off making important decisions until the last possible moment.
- When faced with a problem I usually see the one best solution very quickly.

Its validity and reliability were confirmed in several international samples (for a review of the psychometric qualities of the NFCS, see Kruglanski et al., 1997; Webster & Kruglanski, 1994b). The Korean version showed an acceptable level of reliability (Cronbach's alpha = 0.82).

Results and Discussion

Although the major dependent measure was the degree of attribute-based versus alternative-based searches used, the total number of clicked cells was also examined because previous studies indicated that information search strategy was closely related with the amount of information considered, such that the alternative-based search took more information into consideration than did the attribute-based search (e.g., Klayman, 1983; Payne, 1976; Payne, Bettman, & Johnson, 1988). In all analysis, since the product category did not make any significant difference (i.e., the interaction effect was nonsignificant), data was collapsed across the three product categories.

The Attribute-based vs. the Alternative-based Search. The Search Index developed by Payne (1976) was used to measure one's relative reliance on the alternative-based over the attribute-based search. This index was calculated in the following way:

$$\frac{\text{Alternative transitions} - \text{Attribute transitions}}{\text{Alternative transitions} + \text{Attribute transitions}}$$

In the above formula, alternative (attribute) transitions represent the number of instances in which the $(I + 1)$th cell successively clicked was the same alternative (attribute) as the ith. The lower the Search Index, the more the attribute-based search was performed. It was predicted that the relative preference of the attribute-based search over the alternative-based search would be greater among those with high (vs. low) NFCC, meaning that the Search Index should be lower for those with high (vs. low) NFCC.

As expected, participants with a high NFCC had a lower Search Index ($M = -0.65$) than did participants with a low NFCC ($M = -0.45$), $F(1,75) = 8.05, p < .001$. In other words, participants with a high NFCC were more inclined to engage in the attribute-based search over the alternative-based search than those with a low NFCC. This pattern was held for each product category: mobile phone (-0.60 vs. -0.36), $F(1,75) = 6.50, p < 0.05$; laptop computer (-0.72 vs. -0.56), $F(1,75) = 4.37, p < 0.05$; and digital camera (-0.63 vs. -0.44, $F(1,57) = 4.18, p < 0.05$. Although both groups of participants showed a negative Search Index score, this finding is not unusual, because in a complex choice task such as that in Study 1, people generally prefer the attribute-based over the alternative-based search (e.g., Cook & Swain, 1993; Lohse & Johnson, 1996; Payne & Braunstein, 1978). In line with the above results, these findings confirm that although both groups of individuals favored the attribute-based search over the alternative-based search, it was more pronounced for high NFCC individuals compared to low NFCC individuals.

The Number of Accessed Cells. The total amount of information accessed was measured by the number of cells each participant clicked. Consistent with the expectation, participants with a high NFCC ($M = 53.57$) accessed a smaller number of cells than those with a low NFCC ($M = 63.50$). This difference was

Table 1. Study 1 Results.

	NFCS Score		
	Low	High	
Search Index			
Mobile phones	−0.36[a]	−0.60	$F(1,75) = 6.50$*
Laptop computers	−0.56	−0.72	$F(1,75) = 4.37$*
Digital cameras	−0.44	−0.63	$F(1,75) = 4.18$*
Overall	−0.45	−0.65	$F(1,75) = 8.05$***
Number of Cells Accessed			
Mobile phones	64.88[b]	51.65	$F(1,75) = 8.87$**
Laptop computers	62.83	54.19	$F(1,75) = 3.95$*
Digital cameras	62.80	54.86	$F(1,75) = 3.76$†
Overall	63.50	53.57	$F(1,75) = 6.38$*

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

[a] Numbers indicate search index.

[b] Numbers indicate numbers of cells accessed.

statistically significant, $F(1,75) = 6.38, p < 0.05$. This pattern was also true for each individual product category: mobile phone (51.65 vs. 64.88), $F(1,75) = 8.87$, $p < 0.005$; laptop computer (54.19 vs. 62.83), $F(1,75) = 3.95, p = 0.05$; and digital camera (54.86 vs. 62.80), $F(1,75) = 3.76, p = 0.06$.

Discussion. Study 1 replicated previous findings, in which high-NFCC individuals considered smaller amounts of information than those with low NFCC. More importantly, Study 1 demonstrated that those with high NFCC engaged in the attribute-based information search over the alternative-based information search more than their counterparts who had low NFCC. This finding suggests that those with high NFCC simplify their decision situation by structuring the attributes in the order of importance and then decide which attributes to consider. Once the "critical" attribute(s) is selected, they compare the alternatives on that attribute and arrive at their choice. Findings are summarized in Table 1.

As discussed, the attribute-based search is a more simplified way of searching and combining information than the alternative-based search. The latter entails more cognitive and emotional difficulties than the former. Therefore, it seems understandable why high (vs. low) NFCC is associated more with the attribute-based search than the alternative-based search.

STUDY 2

Study 1 demonstrated that chronic individual difference in NFCC was associated with the style of information search. Namely, those with high NFCC considered less information and used the attribute-based search over the alternative-based search more than those with low NFCC. However, Study 1 was basically a correlational study, which makes it difficult to draw a firm conclusion about causality. Hence, an experimental study seems warranted in which NFCC is experimentally manipulated.

One of the most common manipulations of NFCC is manipulating time pressure (e.g., Freund, Kruglanski, & Schpitzajzen, 1985; Heaton & Kruglanski, 1991; Kruglanski & Freund, 1983). Generally speaking, time pressure creates a heightened need for closure (Kruglanski, 2004). In Study 2, a group of participants was asked to complete each of the three choice problems within 2 minutes (time pressure condition), and another group of participants was given no such time constraint (control condition). It was expected that the participants in the time-pressure condition would experience a higher level of NFCC than their counterparts in the control condition. Consequently, the relative preference of the attribute-based over the alternative-based search would be greater in the former than in the latter condition. Moreover, the number of clicked cells would also be smaller in the former than in the latter condition. Results of Study 2 are displayed in Table 2.

Method

Participants. Fifty-four introductory psychology students at a large university participated in Study 2 for partial course credit.

Procedure. The procedure for the control condition was identical to that of Study 1 except that participants in Study 2 did not fill out the NFCS. The only

difference in the procedure for the control and the time-pressure condition was that the participants in the time pressure condition were allowed only two minutes for each choice problem. This two-minute time limit was shorter than the average time those with high NFCC took in completing each choice task in Study 1 (132.44 ms). After two minutes, the "MAKE A CHOICE" window popped up automatically and participants were requested to input their choice in the window immediately. The following instruction was given to the participants in the time-pressure condition:

> You "Must" make a decision for each product category within two minutes. If you do not select an option within the limited time, a "MAKE A CHOICE" window will pop up automatically. As soon as the pop-up window appears, you have to record your choice immediately. You cannot click a new cell once the pop-up window appears.

Participants in the control condition could take as much time as they wanted to make a final choice. As in Study 1, all participants were offered a practice session to familiarize themselves with the task.

Results and Discussion

The prediction was that participants in the time pressure condition (vs. control condition) would follow the pattern of information search associated with those with high NFCC, namely a smaller Search Index and a smaller number of clicked cells.

Manipulation Check: Decision Latency. Overall, participants in the time-pressure condition took less time than those in the control condition to make a final choice (102.04 ms vs. 174.24 ms), $F(1,50) = 15.75$, $p < 0.001$. The interaction effect of time and product category was not significant ($F < 1$), indicating that the time-pressure condition resulted in a quicker choice than the control condition for all three products: mobile phone (105.78 ms vs. 191.73 ms),

Table 2. Study 2 Results.

	NFCC Manipulation		
	Control Condition	Time Pressure Condition	
Search Index			
Mobile phones	−0.37[a]	−0.54	$F(1,52) = 3.76^{\dagger}$
Laptop computers	−0.48	−0.68	$F(1,52) = 6.77^{*}$
Digital cameras	−0.42	−0.67	$F(1,52) = 9.81^{**}$
Overall	−0.42	−0.63	$F(1,52) = 8.59^{**}$
Number of Cells Accessed			
Mobile phones	55.59[b]	48.74	$F(1,52) = 2.02$
Laptop computers	61.70	49.22	$F(1,52) = 7.30^{**}$
Digital cameras	58.93	49.33	$F(1,52) = 4.01^{*}$
Overall	58.74	49.10	$F(1,52) = 5.04^{*}$

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.
[a] Numbers indicate search index.
[b] Numbers indicate numbers of cells accessed.

laptop computer (99.16 ms vs. 173.01 ms), and ligital camera (101.17 ms vs. 158.02 ms) (all ps < 0.001).

The Attribute-Based vs. the Alternative-Based Search. The prediction was that the Search Index would be lower in the time-pressure condition than in the control condition because participants in the former condition would be in a state of higher NFCC compared to their counterparts in the latter condition.

As expected, the Search Index was significantly lower in the time-pressure condition (−0.63) than in the control condition (−0.42). This difference was statistically significant, $F(1,52) = 8.59, p = 0.005$. Again, this pattern was obtained for all three products: mobile phone (−0.54 vs. −0.37), $F(1,52) = 3.76, p = 0.06$; laptop computer (−0.68 vs. −0.48), $F(1,52) = 6.77, p < 0.05$; and digital camera (−0.67 vs. −0.42, $F(1,52) = 9.81, p < 0.005$. This pattern of results is virtually identical to that of Study 1. It is noteworthy that the Search Index in the time-constraint condition in Study 2 is similar to that of the high-NFCC condition in Study 1 (−0.63 vs. −0.65). The same is true for the control condition in Study 2 and the low-NFCC condition in Study 1 (−0.42 vs. −0.45). A summary of results from Study 2 are shown in Table 2.

The Number of Cells Accessed. As expected, participants in the time pressure condition ($M = 49.10$) accessed a smaller number of cells than those in the control condition ($M = 58.74$), $F(1,52) = 5.04, p < 0.05$. This pattern was true for both laptop computers (49.22 vs. 61.70), $F(1,52) = 7.30, p < 0.01$, and digital cameras (49.33 vs. 58.93), $F(1,75) = 4.01, p = 0.05$. Although the difference was not statistically significant for mobile phones (48.74 vs. 55.59), $F(1,52) = 2.02$, $p = 0.16$, the direction of difference was consistent with the prediction. However, since the interaction effect of product category and condition was not significant, $F(2,104) = 1.30$, ns, the nonsignificant effect for mobile phones did not pose a serious challenge to these findings. A significant effect for mobile phones would have been obtained with a larger number of participants.

Discussion. In sum, Study 2, as opposed to measuring NFCC as was done in Study 1, manipulated the level of NFCC by means of time pressure. Study 1 and Study 2, taken together, suggest that compared to low NFCC, high NFCC—either measured as an individual difference, or situationally evoked— causes one to engage in the attribute-based search over the alternative-based search and consider smaller amounts of information in decision making. The theoretical and practical implications of these findings are subsequently discussed along with limitations and future research directions.

GENERAL DISCUSSION

The present research seems to tell a convincing story: NFCC creates a difference in the way people search for and combine information, such that high (vs. low) NFCC individuals prefer the attribute-based search over the alternative-based search more and seek smaller amounts of information. The present findings are generally in line with past research on NFCC in that it links those high in NFCC relative to those low in NFCC to quick and effortless information processing. In particular, these results support the work of Dhar and Nowlis (1999),

who found that non-compensatory decision rules mediate the effect of time pressure on choice deferral by confirming that high (vs. low) NFCC subjects (evoked via time pressure) engaged in more attribute-based search (application of non-compensatory decision rules) that demanded less conflict and facilitated prompt closure and decision making. In essence, what this study finds is that the degree of NFCC influences consumer choice via different information search processes (i.e., varying degree of Search Index).

There has been growing interest among the marketing and consumer psychology academic community regarding the construct of NFCC and its relationship to information processing and decision making. This study fills the void in the literature by showing that NFCC, whether measured as an individual difference variable or manipulated as a situationally evoked variable, influences the types of decision rules individuals use through the information search strategy pursued. No study to date has addressed the linkage between NFCC and information search strategies. In this light, this study reports that high (vs. low) NFCC individuals are conflict-avoiding, preferring less cognitive effort and seeking less information to arrive at a prompt closure when confronted with a decision.

Thus, the major contribution of the present finding is that it demonstrates that NFCC affects the very early stage of information processing in which an individual seeks information. As discussed at the outset, most of the past research on NFCC dealt with how NFCC affected the way an individual utilized the given information. However, the present research examined a judgmental situation in which individuals had to search relevant information by themselves, and found that NFCC affected such an information-acquisition process.

In Study 2, time pressure was manipulated to evoke high NFCC. Research has shown that time pressure or constraints affect consumer behavior and choice in various ways (Bettman, Luce, & Payne, 1998; Dhar & Nowlis, 1999; Park, Iyer, & Smith, 1989). The present research adds to this literature by showing that time pressure can affect one's information search process. The results of this study also have implications for conflict management (Deutsch, 1973). High NFCC implies conflict avoidance. Thus, in negotiation research, it would be of theoretical and practical interest to examine how NFCC is related to collaborative, accommodative, and confrontational conflict management styles. Knowing the level of NFCC before engaging in a business relationship or negotiation could equip the prepared party to come out ahead by knowing what to expect. Further, in sales management, closing a sale is extremely important. In other words, unless one is able to successfully close a sale, the transaction is not complete. This suggests that knowledge of NFCC of sales personnel is invaluable information to have. When sales personnel have a high NFCC, they may attempt to close the deal before it is warranted, leaving money on the table. Appropriate training and education seems necessary to restrain the temptation on the part of high-NFCC sales people to prematurely close a deal.

The applicability of NFCC to the consumer context seems like a promising area of research. For example, the authors asserted that high-NFCC individuals strive for permanency as a result of their dislike of changing means to achieve different goals. In other words, those high in NFCC prefer products that can be used across various situations, entailing the preference for multifinality. This was captured in the freeze behavior of individuals high in NFCC. This suggests that high-NFCC consumers may be less likely to engage in variety seeking, because

such behavior is the exact opposite of what high-NFCC consumers strive for (Dodd, Pinkleton, & Gustafson, 1996). Variety seeking involves the pursuit of a single goal through multiple means and channels (i.e., equifinality) (McAlister, 1982). Also, because of a desire to retain the permanency status, high-NFCC individuals will want to satisfy as much as possible with a given product. This tendency may create higher switching costs and lead to greater customer commitment and loyalty. Moreover, future research should address whether higher NFCC is associated with affective or calculative commitment.

Two fascinating questions also arise from the present research. First, it would be interesting to examine whether the eye movement pattern of those with high (vs. low) NFCC corresponds closer to the attribute-based search over the alternative-based search. When all cells are open and the relevant value of each attribute is available, will those with a high NFCC "see" cells in a way that corresponds to the attribute-based search more than those with a low NFCC? If so, this would demonstrate that individuals with high (vs. low) NFCC engage in literally different patterns of search behavior.

Second, it would also be interesting to see whether the present finding is observed even in memory patterns. Suppose that participants receive the information matrix format as in the present research but find that all cells are open from the beginning. In other words, participants can see the values of all attributes for all alternatives from the outset and then make their final choices. If participants are asked to recall the value of each cell as much as possible, will those with high (vs. low) NFCC show a memory pattern that more closely resembles an attribute-based memory pattern over an alternative-based memory pattern? Will those with high NFCC display a better memory for the attribute-based information than the alternative-based information? Future research should address these questions.

REFERENCES

Abelson, R. P., & Levi, A. (1985). Decision making and decision theory. In G. Lindzey & E. Aronson (Eds.), The handbook of social psychology, (Vol. 1, pp. 231–309). New York: Random House.

Bettman, J. R., Luce, M. F., & Payne, J. W. (1998). Constructive consumer choice processes. Journal of Consumer Research, 25, 187–217.

Brislin, R. (1970). Back-translation for cross-cultural research. Journal of Cross-Cultural Psychology, 1, 185–216.

Chu, P. C., Spires, E. E., & Sueyoshi, T. (1999). Cross-cultural difference in choice behavior and use of decision aids: A comparison of Japan and the United States. Organizational Behavior and Human Decision Processes, 77, 147–170.

Chun, W. Y., Kruglanski, A. W., Sleeth-Keppler, D., & Friedman, R. (2005). The multifinality principle in choice without awareness. Manuscript submitted for publication.

Cook, G. J., & Swain, M. R. (1993). A computerized approach to decision process tracing for decision support system design. Decision Science, 24, 931–952.

Dhar, R., & Nowlis, S. M. (1999). The effect of time pressure on consumer choice deferral. Journal of Consumer Research, 25, 369–384.

Deutsch, M. (1973). The resolution of conflict. New Haven, CT: Yale University Press.

Dodd, T. H., Pinkleton, B. E., & Gustafson, A. W. (1996). External information sources of product enthusiasts: Differences between variety seekers, variety neutrals, and variety avoiders. Psychology & Marketing, 13, 291–304.

Ford, T. E., & Kruglanski, A. W. (1995). Effects of epistemic motivations on the use of accessible constructs in social judgment. Personality and Social Psychology Bulletin, 21, 950–962.
Freund, T., Kruglanski, A. W., & Schpitzajzen, A. (1985). The freezing and unfreezing of impressional primacy: Effects of the need for structure and the fear of invalidity. Personality and Social Psychology Bulletin, 11, 479–487.
Heaton, A., & Kruglanski, A. W. (1991). Person perception by introverts and extraverts under time pressure: Need for closure effects. Personality and Social Psychology Bulletin, 17, 161–165.
Hogarth, R. (1987). Judgment and choice (2nd ed.). Chichester, UK: Wiley.
Houghton, D. C., & Grewal, R. (2000). Please, let's get an answer—any answer: Need for consumer cognitive closure. Psychology & Marketing, 17, 911–934.
Janis, I. L., & Mann, L. (1977). Decision making: A psychological analysis of conflict, choice, and commitment. New York: Free Press.
Johnson, E. J., Payne, J. W., Schkade, D. A., & Bettman, J. R. (1986), Monitoring information processing and decisions: The MOUSELAB system. Unpublished manuscript, Center for Decision Studies, Duke University, Durham, NC.
Kardes, F. R., Cronley, M. L., Kellaris, J. J., & Posavac, S. S. (2004). The role of selective information processing in price-quality inference. Journal of Consumer Research, 31, 368–374.
Kardes, F. R., Sanbonmatsu, D. M., Cronley, M. L., & Houghton, D. C. (2002). Consideration set overvaluation: When impossibly favorable ratings of a set of brands are observed. Journal of Consumer Psychology, 12, 353–361.
Klayman, J. (1983). Analysis of predecisional information search pattern. In P. C. Humphreys, O. Svenson, & A. Vari (Eds.), Analyzing and aiding decision processes (pp. 401–414). Amsterdam: North Holland.
Kossowska, M., Van Hiel, A., Chun, W. Y., & Kruglanski, A. W. (2002). The need for cognitive closure scale: Structure, cross-cultural invariance, and comparison of mean ratings between European American and East Asian samples. Psychologica Belgica, 42, 267–286.
Kottemann, J. E., & Davis, F. D. (1991). Decisional conflict and user acceptance of multicriteria decision-making aids. Decision Science, 22, 918–926.
Kruglanski, A. W. (1989). Lay epistemics and human knowledge: Cognitive and motivational bases. New York: Plenum.
Kruglanski, A. W. (2004). The psychology of closed mindedness. New York: Psychology Press.
Kruglanski, A. W., Atash, M. N., DeGrada, E., Mannetti, L., & Webster, D. M. (1997). Psychology theory testing versus psychometric nay-saying: Comment on Neuberg et al.'s (1997) critique of the Need for Closure Scale. Journal of Personality and Social Psychology, 73, 1005–1016.
Kruglanski, A. W., & Freund, T. (1983). The freezing and un-freezing of lay-inferences: Effects on impressional primacy, ethnic stereotyping and numerical anchoring. Journal of Experimental Social Psychology, 19, 448–468.
Kruglanski, A. W., & Webster, D. M. (1996). Motivated closing of the mind: "Seizing" and "freezing." Psychological Review, 103, 263–283.
Lohse, G. L., & Johnson, E. J. (1996). A comparison of two processing-tracing methods for choice tasks. Organizational Behavior and Human Performance, 68, 28–43.
Mayseless, O., & Kruglanski, A. W. (1987). What makes you so sure? Effects of epistemic motivations on judgmental confidence. Behavior and Human Decision Processes, 39, 162–183.
McAlister, L. (1982). A dynamic attribute satiation model of variety-seeking behavior. Journal of Consumer Research, 9, 141–150.
Park, C. W., Iyer, E. S., Smith, D. C. (1989). The effects of situational factors on in-store grocery shopping behavior: The role of store environment and time available for shopping. Journal of Consumer Research, 15, 422–433.

Payne, J. W. (1976). Task complexity and contingent processing in decision making: An information search and protocol analysis. Organizational Behavior and Human Performance, 16, 366–387.
Payne, J. W., Bettman, J. R., & Johnson, E. J. (1988). Adaptive strategy selection in decision making. Journal of Experimental Psychology: Learning, Memory, and Cognition, 14, 534–552.
Payne, J. W., & Braunstein, M. L. (1978). Risky choice: An examination of information acquisition behavior. Memory and Cognition, 6, 554–556.
Shah, J. Y., Kruglanski, A. W., & Thompson, E. P. (1998), Membership has its (epistemic) reward: Need for closure effects on ingroup bias. Journal of Personality and Social Psychology, 75, 383–393.
Svenson, O. (1979). Process descriptions of decision making. Organizational Behavior and Human Performance, 23, 83–112.
Tversky, A. (1972). Elimination by aspect: A theory of choice. Psychological Review, 79, 281–299.
Vermeir, I., & Van Kenhove, P. (2005). The influence of need for closure and perceived time pressure on search effort for price and promotional information in a grocery shopping context. Psychology & Marketing, 22, 71–95.
Vermeir, I., Van Kenhove, P., & Hendrickx, H. (2002). The influence of need for closure on consumers' choice behavior. Journal of Economic Psychology, 23, 703–727.
Webster, D. M. (1993). Motivated augmentation and reduction of the overattribution bias. Journal of Personality and Social Psychology, 65, 261–271.
Webster, D. M., & Kruglanski, A. W. (1994a). Alcohol effects on social perception and interaction. Paper presented at the annual meeting of the American Psychological Association, Los Angeles, CA.
Webster, D. M., & Kruglanski, A. W. (1994b). Individual differences in need for cognitive closure. Journal of Personality and Social Psychology, 67, 1049–1062.
Webster, D. M., Richter, L., & Kruglanski, A. W. (1996). On leaping to conclusions when feeling tired: Mental fatigue effects on impression formation. Journal of Experimental Social Psychology, 32, 181–195.
Zhang, S., Kardes, F. R., & Cronley, M. L. (2002). Comparative advertising: Effects of structural alignability on target brand evaluations. Journal of Consumer Psychology, 12, 303–311.

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