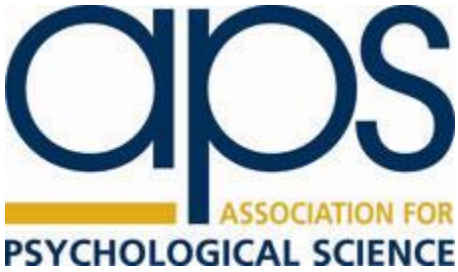

Research Report

The Deliberation-Without-Attention Effect

Evidence for an Artifactual Interpretation

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ABSTRACT—*Proponents of unconscious-thought theory assert that letting the unconscious "mull it over" can enhance decisions. In a series of recent studies, researchers demonstrated that participants whose attention was focused on solving a complex problem (i.e., those using conscious thought) made poorer choices, decisions, and judgments than participants whose attention was distracted from the problem (i.e., those purportedly using unconscious thought). We argue that this finding, rather than establishing the existence of a deliberation-without-attention effect, is explained more compellingly in terms of the well-established distinction between on-line and memory-based judgments. In Experiment 1, we reversed the recent finding by simply changing participants' on-line processing goal from impression formation to memorization. Experiment 2 provided a replication and further established that some cognitive effort appears necessary to produce both the original pattern of results and its reversal, suggesting that such judgments are ultimately a product of conscious, rather than unconscious, thinking.*

Martin Luther King, Jr., astutely noted, "Nothing pains some people more than having to think" (1963/1981, p. 14). Unconscious-thought theory (UTT; Dijksterhuis & Nordgren, 2006) appears to offer solace to such individuals. According to UTT, when it comes to making complex decisions, conscious reasoning requiring cognitive effort is maladaptive; "unconscious thinking," defined as effortless deliberation in the absence of attention directed at the problem domain, produces superior judgments.[1] The evidence purportedly supporting this deliberation-without-attention effect derives from a paradigm that assumes that unconscious thought predominates when attention is diverted from a decision task via distraction (Dijksterhuis, 2004; Dijksterhuis, Bos, Nordgren, & van Baaren, 2006). However, we propose that the deliberation-without-attention effect is an artifact that can be explained more simply in terms of on-line and memory-based judgments (Hastie & Park, 1986).

THE UTT PARADIGM

Before describing our position, it is necessary to demarcate five critical stages of the UTT paradigm. During the first stage, participants receive *preacquisition instructions*. In the original UTT experiments, these instructions consisted of telling participants "to form an impression" of the target items (e.g., different makes of cars) to which they would subsequently be exposed. The next stage is *acquisition*, during which a large number of attributes of the various target items are presented individually and randomly for a brief period of time (e.g., 8 s per attribute). Target items vary in the proportion of their attributes that are relatively positive (e.g., good road stability) and relatively negative (e.g., poor gas mileage). Typically, one target item has two thirds positive attributes, a second has one third positive attributes, and two others have half of their attributes positive and half negative. The third stage involves delivering *postacquisition instructions* to participants. In most UTT experiments, these instructions take one of two forms: Participants are asked to carefully think about each of the target items or to perform a

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[1]UTT theorists acknowledge that conscious thinking produces better judgments when the decision task is simple. Our focus, however, is specifically on decision tasks that are complex, which we operationalize in the same manner as in prior UTT studies (see the Method section of Experiment 1).

distractor task (e.g., solve anagrams), the purpose of which is to prevent conscious thought about the target items. This is followed by *postacquisition*, which is typically a 3- to 4-min block of time allowing participants to carry out whichever of the postacquisition instructions they had been provided. Finally, the *judgment* stage occurs, at which point participants indicate their evaluations of the target items.

The key finding of UTT studies is that participants instructed to think carefully about the target items during the postacquisition stage ultimately manifest a weaker preference for the target item with the most positive attributes than do participants distracted from engaging in such conscious deliberation. UTT theorists maintain that unconscious thinking occurs during the distraction period, causing the memory "representations of moderately positive alternatives [to] become more dominated by positive aspects, whereas the representations of negative alternatives become more negative over time" (Dijksterhuis, 2004, p. 593). This hypothesized polarization process, in turn, is said to allow participants to effortlessly arrive at a superior judgment (but see González-Vallejo, Lassiter, Bellezza, & Lindberg, 2008, for a critique of this position and other aspects of UTT). We argue, however, that these results are better explained by employing a classic distinction in the judgment literature.

ON-LINE VERSUS MEMORY-BASED JUDGMENTS

Hastie and Park (1986) postulated that, depending on the circumstances, decision makers arrive at judgments in one of two ways: through memory-based operations or through on-line operations. For some tasks or under certain conditions, the process of deciding is said to be memory based, in that decision makers "must perforce rely on the retrieval of relatively concrete evidence from long-term memory in order to render a judgment" (Hastie & Park, 1986, p. 261). In many circumstances, however, decision makers form judgments while relevant information from the environment is still available in working memory, a process of deciding that is said to be on-line because judgments are continually updated in working memory as items of evidence are acquired. Once finalized, the on-line judgment is stored in long-term memory, whereas much of the evidence on which it is based may be forgotten (cf. Hogarth & Einhorn, 1992). Hastie and Park's conceptualization was critical to understanding conflicting findings in the judgment literature with regard to whether (and when) memory and judgment are directly related. We believe that this conceptualization is also pertinent to correctly interpreting the provocative findings obtained with the UTT paradigm.

Specifically, we contend that participants given the preacquisition instructions "to form an impression" effortfully integrate decision-relevant information as it is being acquired (i.e., generate on-line judgments) and, by necessity, default to their memory of these reasonable first impressions after a distraction period that prevents any postacquisition, conscious deliberation (cf. Betsch, Plessner, Schwieren, & Gütig, 2001). Participants permitted and encouraged to think carefully after receiving decision-relevant information, however, do not default to the on-line impressions they formed. Instead, we argue that they interpret the instructions to "think carefully" as a mandate to recall specific decision-relevant information encountered during the acquisition stage (i.e., individual attributes) and effortfully formulate a memory-based judgment on the spot. However, because these participants are asked to form impressions from the outset, and the large amount of information originally presented is unorganized and available for examination only briefly, their subsequent memory of the attribute information and, thus, their memory-based judgments are likely to be impaired. The net result is that participants who are distracted from attending to decision-relevant information during the postacquisition period ironically manifest seemingly better judgments (by accessing the stored impressions they had earlier formed on-line) than do those who presume they are to attend to and ruminate on whatever diminished amount of relevant (attribute) information they can recall to make their evaluations.

If our artifactual interpretation of the UTT finding is correct, it should be possible to reverse the usual pattern by instructing participants at preacquisition to memorize decision-relevant information rather than instructing them to form an impression. That is, we would expect participants instructed to memorize to be less likely to form on-line impressions during acquisition (because they are directing their efforts toward maximizing retention) and to have enhanced memory for decision-relevant information at postacquisition (Cohen & Ebbesen, 1979). The combination of these effects should make it more difficult for participants distracted at postacquisition to arrive at a reasonable judgment, because such participants would have neither a previously formed on-line impression in memory nor the opportunity to consciously deliberate on what they could remember regarding the decision-relevant (attribute) information.

These same effects, however, should make it less difficult for participants explicitly instructed and given the opportunity to think carefully at postacquisition to arrive at a reasonable judgment, because such participants would have better memory for decision-relevant (attribute) information and the time and encouragement to evaluate it and reach a memory-based decision. If the effects previously observed with this paradigm were indeed the result of unconscious thinking during the distraction period, then the preacquisition instructions to memorize should yield preference judgments identical to those found with the original preacquisition instructions to form an impression; in other words, relatively better judgments will follow distraction rather than careful, conscious deliberation. Using procedures and materials very similar to those employed by Dijksterhuis et al. (2006), we tested our proposed account of findings obtained with the UTT paradigm in two experiments.

EXPERIMENT 1

Method

Eighty-five university students were presented with 48 attributes about four different cars (12 attributes per car).[2] One car had 8 positive and 4 negative attributes, two cars had 6 positive and 6 negative attributes, and the final car had 4 positive and 8 negative attributes. Each attribute was presented separately and in random order for 8 s.

Before the presentation of attributes (preacquisition), some participants (via random assignment) were directed to form impressions of the cars. This is the standard instruction used with this paradigm and has been shown to favor on-line-judgment formation over information retention (Cohen & Ebbesen, 1979). Other participants were directed to memorize the attributes; prior research indicates that this instruction favors information retention over on-line-judgment formation (Cohen & Ebbesen, 1979). All participants were informed that there would be questions about the to-be-seen information later in the experiment.

After the presentation of attributes (postacquisition), participants were either given 4 min to think carefully about each of the cars or given an anagram task that distracted them from attending to the cars. After 4 min had elapsed, participants provided their attitude toward each of the four cars on separate 11-point scales (with 5-unit increments) ranging from −25 (*very negative*) to +25 (*very positive*).

Results

Following the method of Dijksterhuis and van Olden (2006), we created a strength-of-preference index by subtracting the average attitude toward the three cars with lower numbers of positive attributes from the average attitude toward the car with the highest number of positive attributes. Larger strength-of-preference values indicated a stronger preference for the latter vehicle. Data were submitted to a 2 (preacquisition instruction: form impression vs. memorize attributes) × 2 (postacquisition instruction: think about cars vs. solve anagrams) analysis of variance. Only a significant two-way interaction emerged, $F(1, 81) = 5.09, p < .05$ (see Table 1 for means). As in previous UTT studies, participants given the standard goal of forming impressions showed a relatively stronger preference for the car with the highest number of positive attributes when they were distracted from thinking about the cars than when they were told to think carefully, $t(81) = 1.53, p < .07$ (one-tailed). However, as we predicted, this pattern was reversed for participants given the new goal of memorization, $t(81) = 1.65, p = .05$ (one-tailed).

TABLE 1

Mean Strength of Preference for the Car With the Most Positive Attributes as a Function of Pre- and Postacquisition Instruction (Experiment 1)

	Postacquisition instruction	
Preacquisition instruction	Solve anagrams (distraction)	Think carefully
Form impression	1.78 (1.83)	0.80 (1.96)
Memorize attributes	0.92 (2.33)	1.95 (1.97)

Note. Higher values indicate a stronger preference for the car with the highest number of positive attributes. Standard deviations are given in parentheses.

EXPERIMENT 2

A second experiment duplicated the design of the first, but additionally included an individual difference measure of participants' tendency to engage in effortful (and therefore conscious) thought: the Need for Cognition Scale (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Research on this personality construct has shown that some people truly enjoy, and frequently engage in, thinking carefully and extensively (i.e., are high in need for cognition), whereas others draw little pleasure and actively avoid exerting cognitive effort whenever possible (i.e., are low in need for cognition).

We examined individual differences in need for cognition to further establish that the hypothesized operations underlying the results of Experiment 1 do indeed require cognitive effort and are therefore fundamentally conscious rather than unconscious in nature. During acquisition, participants low (relative to high) in need for cognition should put less effort into forming online impressions or trying to accurately remember attribute information (depending on the preacquisition instructions they received). Likewise, during postacquisition, participants low (relative to high) in need for cognition should be less motivated to deliberate extensively on remembered attribute information in order to formulate a memory-based judgment. If our artifactual interpretation is correct, these anticipated differences in effortful processing would lead us to expect that the original UTT finding and the reversal of that pattern observed in Experiment 1 will replicate for participants high, but not low, in need for cognition. However, if UTT's explanation, based on the existence of unconscious (effortless) thinking, is correct, then participants' level of need for cognition, which theoretically affects only conscious thought processes, should have no significant impact on their overall pattern of preference judgments.

Method

One hundred eighty-two university students were run through the procedure used in Experiment 1 with one additional step: After responding to the dependent variables, participants completed the 18-item Need-for-Cognition Scale.

Results

A median split on the distribution of need-for-cognition scores produced groups of participants relatively high and low in need

[2]Across Experiments 1 and 2, 10 additional participants who gave identical ratings to all the cars were excluded. Inclusion of these data alters neither the pattern nor the significance of the results.

TABLE 2

Mean Strength of Preference for the Car With the Most Positive Attributes as a Function of Pre- and Postacquisition Instruction and Level of Need for Cognition (Experiment 2)

Need for cognition and preacquisition instruction	Postacquisition instruction	
	Solve anagrams (distraction)	Think carefully
Low need for cognition		
Form impression	1.20 (2.82)	1.06 (2.62)
Memorize attributes	1.14 (2.03)	0.76 (2.33)
High need for cognition		
Form impression	1.68 (1.90)	0.77 (2.44)
Memorize attributes	0.33 (2.75)	1.86 (1.77)

Note. Higher values indicate a stronger preference for the car with the highest number of positive attributes. Standard deviations are given in parentheses.

for cognition; this factor was added to an analysis that otherwise was identical to the one conducted for Experiment 1.[3] The only effect to achieve significance was the anticipated three-way interaction, $F(1, 174) = 3.64$, $p = .05$ (see Table 2 for means). For participants relatively high in need for cognition, the pattern of preferences observed in Experiment 1 was replicated and the critical two-way interaction was once again significant, $F(1, 87) = 6.74$, $p < .05$. When given the standard goal of forming impressions, participants high in need for cognition tended to show a relatively stronger preference for the car with the highest number of positive attributes when distracted than when explicitly told to think carefully, $t(87) = 1.32$, $p < .10$ (one-tailed). This pattern was reversed for participants high in need for cognition who were given the new goal of memorization, $t(87) = 2.40$, $p < .05$. There were no significant differences in preference among those low in need for cognition (Fs < 1).

DISCUSSION

Together, Experiments 1 and 2 demonstrate that our proposed account of findings obtained with the UTT paradigm is plausible and suggest that the deliberation-without-attention effect is more artifact than fact. Of course, it is important to consider whether the present results could be explained in terms of the kind of unconscious thinking postulated by UTT. Our postacquisition instructions were identical to those used in previous UTT studies, so it is unclear why the pattern changed in the memorization condition; presumably, unconscious thought would proceed in the same manner in that condition as in the traditional form-impression condition. UTT theorists might counter that changing the preacquisition instructions from forming impressions to memorizing decision-relevant information deprived participants of a legitimate processing goal, which they argue is necessary to activate unconscious thinking (Dijksterhuis & Nordgren, 2006). However, the goal of memorizing information is as valid a processing goal as forming impressions (Hastie et al., 1980), and one with which our participants (university students) no doubt had considerable experience.

In addition, the demonstration in Experiment 2 that only individuals high in need for cognition displayed the pattern observed in Experiment 1 makes it unlikely that our results could be accounted for in terms of unconscious thinking. Individuals high in need for cognition typically engage in more effortful thought than those low in need for cognition, especially when the task they are performing is cognitively challenging (Cacioppo et al., 1996), as is obviously the case in the UTT paradigm. If the observed differences in preference judgments for individuals high in need for cognition were, in fact, due to effortless, unconscious deliberation, then individuals low in need for cognition should have manifested a comparable pattern. That some cognitive effort appears necessary to produce divergent judgments in the UTT paradigm suggests that such judgments are ultimately a product of conscious, rather than unconscious, thinking.

Finally, we wish to make clear that our arguments are confined to the notion of unconscious thinking as described by UTT. We are not suggesting that a variety of other nonconscious mental processes that influence judgments and decisions never occur. Indeed, more than three decades of research in the areas of cognitive and social psychology has demonstrated, rather convincingly, that unconscious mental processes can influence judgments, evaluations, memory, and behavior under certain conditions (e.g., Bargh, 1990; Jacoby, 1991; Nisbett & Wilson, 1977; Shiffrin & Schneider, 1977; Zajonc, 1980). However, the portrait of the unconscious that has emerged is qualitatively different from the one proposed by UTT, particularly with regard to the complexity of cognitive tasks it is presumed to be able to perform (cf. Greenwald, 1992).

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[3]Data were also analyzed using a regression approach that included participants' actual need-for-cognition score as a predictor variable. This analysis yielded significant effects comparable to those reported in the text. We present the median-split analysis because it allows for a comparison of means across the two studies, whereas the regression analysis does not.

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