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FlashReport

Should I think carefully or sleep on it?: Investigating the moderating role of attribute learning☆

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HIGHLIGHTS

- The impact of prior learning is examined within Unconscious Thought Theory (UTT).
- Unconscious thought improved decision making regardless of information type.
- Conscious thought improved decision making when information was highly specific.
- Information specificity is identified as a critical moderator of UTT effects.

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ABSTRACT

An emerging debate in the judgment and decision making literature has focused on whether unconscious thought can improve complex decision making beyond conscious thought. However, a previously overlooked factor in this debate is the role of attribute learning prior to deliberation. The effect of information specificity in prior learning is examined here. When attribute information is less specific (i.e. presented in valence), unconscious thought improves decision making beyond conscious thought. However, when attribute information is more specific (i.e. presented in absolute values), conscious thought with attribute information improves choice similarly to unconscious thought. These findings help bridge previous inconsistencies by suggesting that initial attribute learning exerts an important influence on the effectiveness of conscious and unconscious thought in complex decision making.

Introduction

An emerging perspective in the judgment and decision making literature has suggested that unconscious information processing (or "sleeping on it") can improve choice in complex decisions (Dijksterhuis, 2004; Dijksterhuis, Bos, Nordgren, & van Baaren, 2006). These findings provide the basis for Unconscious Thought Theory (UTT; Dijksterhuis & Nordgren, 2006). Support for UTT is rapidly increasing, as unconscious thought has been shown to improve decision making beyond conscious deliberation in a variety of domains (e.g. Creswell, Bursley, & Satpute, 2013; Dijksterhuis, Bos, van der Leij, & van Baaren, 2009; Lerouge, 2009; Messner & Wänke, 2011). However, despite the growing support for UTT, several studies have failed to show that unconscious thought improves complex decision making beyond conscious thought (e.g. Calvillo & Penaloza, 2009; Huizenga, Wetzels, van Ravenzwaaij, & Wagenmakers, 2012; Rey, Goldstein, & Perruchet, 2009). For more information on the issues surrounding UTT, Strick et al. (2011) and Nieuwenstein and van Rijn (2012) provide comprehensive reviews of the UTT literature.

To help resolve some of the inconsistencies across studies examining UTT, the current research investigates how differences in attribute learning impact conscious and unconscious thought in complex decision making. Whereas standard tests of UTT hold the information search stage constant by providing all participants with the same information (Nieuwenstein & van Rijn, 2012), prior learning is manipulated here to investigate differences in each mode of thought. In doing so, a novel approach to testing UTT is developed which helps identify the conditions under which conscious thought is likely to improve complex decision making in a similar manner as unconscious thought.

In the present research, differences in the specificity of information learned and its impact on subsequent decision making are investigated. It is predicted that when information learned is low in specificity (i.e. according to valence), unconscious thought should outperform conscious thought. Conscious thought is better suited for executing propositional rules such as arithmetic (Dijksterhuis & Nordgren, 2006). Because valenced attribute information (e.g. good fuel economy) is qualitative and non-specific, the ability of unconscious thought to process this information via gist memory (Abadie, Waroquier, & Terrier, 2013) should improve subsequent decision making beyond conscious thought.

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However, when information learned is high in specificity (i.e. absolute amounts), conscious thought should improve complex decision making similar to unconscious thought. Conscious thought can utilize propositional rules with specific attribute information (e.g. 38 MPG), provided that information is accessible during deliberation (Huizenga et al., 2012; Shanks, 2006). This should improve decision making in a similar manner as unconscious thought, which distils the valence of specific attribute information to form a global judgment (Strick et al., 2011).

To test this hypothesis, one study was conducted following the procedures of Rey et al. (2009). A pretest was initially conducted to identify a complex decision, as suggested by Strick et al. (2011). The pretest is described next.

Pretest

Twenty undergraduates completed a pretest for course credit. Participants were asked to list decisions they rarely make which are complex in nature. Complex decisions were elicited as unconscious thought is argued to be most beneficial in these settings (Dijksterhuis et al., 2006). Results indicated that buying a computer was the most commonly listed complex decision (70%). Therefore, tablet computers were chosen as the focal product for the study.

In a follow-up questionnaire, the same participants were given a list of tablet PC attributes available in the Appendix A. Participants read a description of each attribute and were asked which level of the attribute they would prefer (e.g. Would you prefer a resistive or capacitive touch screen? Would you prefer a heavier or lighter tablet PC?). Based on a significant majority in preferences (ranging from 80 to 100% for each attribute), a favorable or unfavorable level of each attribute was identified. This information was used during the stimuli development stage to create fictitious products for the main study.

Stimuli development

Two-hundred twenty undergraduates (58.2% male) completed this study for course credit. Participants initially completed an online survey that began with a description of the 12 tablet PC attributes (see Appendix A). After reading the description of the attributes, participants rated each attribute in terms of importance on a 20-point scale (*very unimportant*/*very important*; Rey et al., 2009). This information was used to create four fictitious products with varying scores across the 12 attributes. Weights were then applied to each attribute (as favorable or unfavorable based on the pretest) to form an overall expected utility for each of the four products. One brand was manipulated to have superior utility relative to the other brands and was thus representative of the best brand. The attributes and fictitious products are listed in Table 1.

Participants also completed brand familiarity and attitude questions toward a number of technology manufacturers. Four brands were selected (see Table 1) that were unfamiliar to participants (less than 2 on a 7-point scale) which had no differences in attitude scores. Unfamiliar brands are commonly used in studies examining UTT (Dijksterhuis et al., 2006; Huizenga et al., 2012; Lassiter, Lindberg, Gonzalez-Vallejo, Bellezza, & Phillips, 2009). Furthermore, unfamiliar brands with similar attitudes were chosen to rule out any influence of brand loyalty or familiarity. The brands were randomly assigned to each product.

Main study

Three weeks after the stimuli development phase, participants completed the main study. The same participants from the stimuli development phase were retained to ensure consistent attribute preferences. Participants were randomly assigned to a 2 (specificity of information: low/high)×4 (mode of thought: conscious with attribute information, conscious without attribute information, unconscious, immediate) between-subjects design. Participants completed the study in a behavioral research lab in groups ranging from five to sixteen in size. Participants were seated in separate cubicles and completed a survey hosted on Qualtrics (www.qualtrics.com).

At the beginning of the survey, participants were told they would be identifying the best tablet computer from a set of available options. Participants then received the description of tablet PC attributes in Appendix A. Participants could not advance forward in the survey for a minimum of 30 s to ensure exposure to the attribute descriptions. After reviewing the attribute details, the selection task took place. Participants were told they would view four tablet PC brands. All participants were told to “learn as much as possible about each product” while product information was displayed, as “later you will be asked to choose the best tablet PC”. These instructions were designed to avoid problems of impression formation during learning that have been identified in previous tests of UTT (Lassiter et al., 2009). After reading the instructions, the tablet PC brands were randomly displayed to participants one at a time. Each product was displayed alone on screen for 45 s, after which it was replaced by another randomly chosen product until all four brands had been displayed to participants. In the high specificity of information conditions, the numerical amount of each attribute was displayed (e.g. 10 inch screen size). In the low specificity of information conditions, the attribute was presented as either favorable or unfavorable (e.g. large screen size). In all conditions, the 12 attributes of each product were displayed on screen simultaneously for the entire 45 s in the order listed in Appendix A. A customer rating was included to increase the external validity of the product information. Multiple products were given favorable customer reviews to control for the potential influence of others' judgments and preferences

Table 1
Stimuli used in study.

	Superpad	ViewSonic	Archos	SimpleTech	Weight
Screen size	7 in. (−)	10 in. (+)	7 in. (−)	10 in. (+)	14.9
RAM	1 GB (+)	1 GB (+)	1 GB (+)	256 MB (−)	16.2
Screen display	1024 × 768 (−)	1024 × 768 (−)	1900 × 1280 (+)	1900 × 1280 (+)	15.9
Screen type	Resistive (−)	Capacitive (+)	Capacitive (+)	Resistive (−)	14.9
Operating system	Honeycomb (+)	Gingerbread (−)	Honeycomb (+)	Gingerbread (−)	15.0
Size of app market	150,000 (+)	25,000 (−)	25,000 (−)	25,000 (−)	13.1
Battery life	5 h (−)	5 h (−)	12 h (+)	12 h (+)	17.7
Weight	1 lb (+)	3 lb (−)	3 lb (−)	1 lb (+)	12.7
Voice recognition	No (−)	Yes (+)	No (−)	No (−)	8.6
Cameras	Single (−)	Dual (+)	Dual (+)	Dual (+)	12.5
Colors	Multiple (+)	Black only (−)	Black only (−)	Multiple (+)	8.7
Customer rating	3.5 (−)	4.5 (+)	4.5 (+)	3.5 (−)	13.9
Expected utility	−33	−2.4	**48.6**	1.2	