



The tendency of unconscious thought toward global processing style



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ARTICLE INFO

Keywords:

Unconscious thought
Decision making
Processing style

ABSTRACT

This study explored whether unconscious thought has a tendency to process information globally. In three experiments, a Navon task was used to activate global or local processing styles. Findings showed that in the unconscious-thought groups, those performing the local Navon task presented a poorer decision-making performance when compared to those performing the global Navon task (Experiment 1); participants reported that their judgments were made based on partial attributes (Experiment 2), and evaluated a target individual mainly based on information consistent with stereotypes (Experiment 3). These results showed that when presented with distracter tasks, conscious thought activates local processing, which impairs its ability to process information globally. However, this impairment would not happen if global processing were activated instead. This study provides support to the idea that unconscious thought has a tendency to process information globally.

1. Introduction

Every day individuals are faced with complex decisions, and concentrated deliberation is believed to be necessary in adequate decision-making. As Confucius said, “Think twice before action.” However, this belief has been challenged by recent research suggesting that thought processes for complex decision-making can be carried out without conscious attention, and unconscious thought can sometimes lead to better decision outcomes than conscious thought (e.g., [Abadie, Waroquier, & Terrier, 2013](#); [Dijksterhuis, 2004](#); [Hasford, 2014](#); [Li et al., 2014, 2016](#)). Unconscious thought is defined as “object-relevant or task-relevant cognitive or affective thought processes that occur while conscious attention is directed elsewhere” ([Dijksterhuis & Nordgren, 2006, p. 96](#)). On this basis, [Dijksterhuis and Nordgren \(2006\)](#) developed the Unconscious Thought Theory.

In a study by [Dijksterhuis \(2004\)](#), participants were presented with information about four apartments, one of which was objectively the best apartment, another was objectively the worst apartment, and the final two were of medium attractiveness. One group of participants was given three minutes to carefully consider the positive and negative attributes of the four apartments (conscious thought group), whereas the other group was required to complete a distractor task for the same length of time (unconscious thought group). After the experiment, both groups of participants were asked to evaluate the four apartments. The focus of the study was on whether the participants were able to differentiate between the attractive apartment and the unattractive apartment. [Dijksterhuis](#) subtracted the scores given to the unattractive apartments from the scores given to the attractive apartment, and used the difference scores as the dependent variable. The results indicated that compared to participants who engaged in conscious

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thought, participants who engaged in unconscious thought could more easily differentiate between the attractive apartment and the unattractive apartment. The researcher concluded that the underlying reasons for these experimental results were as follows: (1) Conscious thought has a low processing capacity, while unconscious thought is relatively free from this constraint (Dijksterhuis, 2004); (2) Conscious thought tends to overestimate the importance of particular attributes (for example, information that is easy to express verbally), whereas unconscious thought often adds weight to the comparable significance of numerous attributes (Bos, Dijksterhuis, & van Baaren, 2011).

Subsequently, other researchers began to discover the advantage of unconscious thought over conscious thought in other domains, including creative problem-solving (Yang, Chattopadhyay, Zhang, & Dahl, 2012; Zhong, Dijksterhuis, & Galinsky, 2008), artificial grammar learning (Li, Zhu, & Yang, 2014; Meador & Dienes, 2012), and integration of temporally partitioned information (Li et al., 2014). More importantly, Creswell and colleagues employed fMRI to compare the brain activation of participants in conscious thought, unconscious thought, and immediate decision conditions (Creswell, Bursley, & Satpute, 2013). Their results showed that the participants' right dorsolateral prefrontal cortex and left intermediate visual cortex were activated during information presentation, and these regions continued to be activated during a two-back distracter task completed after the information was presented.

In addition to differences in capacity and weighting, researchers have also found that unconscious thought and conscious thought have the following differences in processing characteristics: (1) Rule principle: conscious thought follows stringent rules in order to perform precise calculations, whereas unconscious thought provides rough estimates (Ric & Muller, 2012); (2) Convergence-versus-divergence principle: conscious thought and its memory search are convergent functions, while unconscious thought tends to be more divergent (Dijksterhuis & Meurs, 2006); (3) Bottom-up-versus-top-down principle: conscious thought, which is guided by expectations and schemata, works in a top-down manner, whereas unconscious thought, which slowly integrates information to make objective summary judgments, works in a bottom-up fashion (Bos & Dijksterhuis, 2011). Based on these differences, unconscious thought and conscious thought are applicable to different circumstances (Dijksterhuis & Nordgren, 2006). In addition to the differences in processing mechanisms, the question of whether other major differences exist between conscious and unconscious thought in terms of information processing methods is worthy of further elaboration.

Global and local processing are two different information-processing styles with a great impact on information processing. Compared to local processing, global processing is more closely related to psychological distance, creativity, and similarity focus. Liberman and Förster (2009) employed the Navon letter discrimination task to activate either the global or local processing styles, followed by the completion of estimation tasks with respect to time, space, social distance, and hypotheticality. The results showed that compared to local processing, participants primed with global processing made larger estimates for psychological distances. Förster and Denzler (2012) used visual, haptic, auditory, olfactory, or gustatory objects to activate either the global or local processing style, after which participants were asked to generate names for cartoons. The study results showed that participants primed with global processing generated more creative names compared to those primed with local processing. Förster (2009) first used the Navon task to activate either the global or local processing style. Then, participants were shown two segments of TV shows, and were asked to find the similarities and dissimilarities between the two video clips. The results indicated that participants primed with global processing generated more similarities between the two video clips, whereas participants primed with local processing generated more dissimilarities. In addition, it has been suggested that manipulating the scope of perceptual attention can correspondingly change the scope of conceptual attention (Derryberry & Tucker, 1994), and hence influence global-local processing style (Förster, Liberman, & Kuschel, 2008). Specifically, when perceptual attention stimulates local features, this activates a low-level semantic network and its associates, which triggers local processing. On the other hand, when perceptual attention stimulates global features, this activates a high-level semantic network and its associates, leading to the activation of global processing (Förster & Dannenberg, 2010).

Research has found that conscious thought processing tends to adopt a local processing style (e.g., Baumeister & Masicampo, 2010; Baumeister, Masicampo, & Vohs, 2011; Dijkstra, van der Pligt, van Kleef, & Kertsholt, 2012; Gollwitzer, 1999; Masicampo & Baumeister, 2011). Conscious thought is closely related to the formulation of specific plans. Masicampo and colleagues found that when unfulfilled goals were activated, as long as participants were allowed to engage conscious thought in the formulation of specific plans related to goal completion, goal-related cognitive activity could be reduced drastically, even if the participants were unable to fulfill their goals. Gollwitzer (1999) also found that implementation intention involves using conscious thought to formulate specific plans to translate general, abstract intentions into specific actions. More importantly, Dijkstra and his colleagues conducted four experiments and showed that when given a task to select artwork, participants in the conscious thought condition were more concerned with the details of the artwork and ignored the overall characteristics (compared to participants in an immediate decision-making condition), resulting in a decline in decision quality. Hence, the researchers suggested that conscious thought tends to adopt a local processing style in the processing of information. This experiment highlights the question of whether unconscious thought has a tendency to process information globally.

Lerouge (2009) suggested that compared to a featural mind-set, a configural mind-set facilitate the processing of information by unconscious Thought. Moreover, Dijksterhuis (2004) pointed out that unconscious thought will cause memory representation to become more polarized, which implies that more positive attributes will be stored in the representation of objectively better alternatives. Conversely, more negative attributes will be stored in the representation of objectively worse alternatives. Unconscious thought will also lead to greater clustering of memory representations, which involves classifying various pieces of information (Dijksterhuis, 2004). Most importantly, Abadie and his colleagues found that unconscious thought is based on the processing of gist memory and not verbatim memory (Abadie et al., 2013). A configural mind-set, polarization, clustering, and gist representation, are closely related to global processing style (e.g., Evans, 2008; Friedman & Förster, 2002; Förster & Dannenberg, 2010; Reyna & Brainerd, 1995). In addition, creativity research has also shown that when solving complex problems (e.g. Duncker's candle

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