



# Concurrent explanations can enhance visual decision making



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## ABSTRACT

The verbalization of one's thoughts has been shown to impair judgment and decision making in some cases, particularly when targets are perceptual. This finding has been attributed to the fact that non-verbal processes are sometimes difficult to verbalize, which may cause a shift in processing that is maladaptive to the task. The study shows that concurrent written explanations can also enhance judgment and decision making in certain visual choice tasks. This finding suggests that the effect of verbalization on perceptual tasks is not dependent on whether the targets of the judgment are verbal or perceptual but rather on whether there is adequate vocabulary to execute the task and whether the task benefits from a more analytic approach.

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## 1. Introduction

Reflection on the process of decision making, particularly through the verbalization of thoughts, has proven this phenomenon to be obscure. Not only do people not always have access to the real reasons for their choices (Nisbett & Wilson, 1977), but the use of introspection may sometimes impair judgment quality (McGlone, Kobrynowics, & Alexander, 2005; McMackin & Slovic, 2000; Rusou, Zakay, & Usher, 2013; Wilson & Schooler, 1991; Wilson et al., 1993). These findings have been attributed to the fact that choices are often based on automatic, unconscious or otherwise non-verbal responses that cannot be accessed verbally (Bargh & Chartrand, 1999; Nisbett & Wilson, 1977; Wegner & Wheatley, 1999; Wilson, 2003). Therefore, people must infer the verbal reasons for their decisions in order to explain them to others or themselves. This process can lead to situations in which individuals are unable to express the real reasons for their choices and instead rely on causal theories that are not always true (Nisbett & Wilson, 1977).

The inability to explain one's choices may also lead to changes in preference, which have been attributed to a lack of verbal access to the real reasons for the preferences; when preferences are difficult to explain, people may switch preferences to alternatives for which the preference is easier to explain (McGlone et al., 2005; Wilson et al., 1993). Another similar change in preference resulting from introspection can be caused

by overemphasizing the less important attributes of the alternatives, which can result in judgments that differ from those that would be made by an expert (Wilson & Schooler, 1991). These preference changes can result in impaired choices when the quality of the choices is defined, for example, by post-choice satisfaction (Wilson et al., 1993), similarity to expert judgments (Wilson & Schooler, 1991) or the number of intransitive preferences (Rusou et al., 2013).

However, decisions are not always impaired by verbalizations; they can also be enhanced by them in some cases. Explaining one's decisions has been shown, for example, to promote accuracy in numerical judgments (McMackin & Slovic, 2000; Rusou et al., 2013), decrease the degree of intransitivity (Hamilton, Hong, & Chernev, 2007) and decrease the framing effect thus enhancing the quality of decision making (Miller & Fagley, 1991; Sieck & Yates, 1997). The impairing effect of verbalization has been most evident in preferential decisions made concerning perceptual stimuli, and the enhancing effect of verbalization on judgments has been most evident in decisions that require normative answers. However, in this paper we show that verbalization can also be beneficial in certain visual judgment tasks, when there is adequate vocabulary to express one's visual experiences and the task benefits from an analytic approach which can override the first impressions that do not contain all the relevant information.

### 1.1. The impairment of perceptual judgments by verbalization

The verbal overshadowing effect refers to a phenomenon in which the performance of a non-verbal task is degraded by concurrent

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verbalization. This effect has been observed in several cognitive tasks, including judgment tasks (Schooler, 2002). Generally, two explanations have been given for the effect of verbalization on judgments and decisions: the *process* and the *content* explanations (Chin & Schooler, 2008). The first refers to the differences between analytic and non-analytic thinking (cf. Hammond, Hamm, Grassia, & Pearson, 1987; McMackin & Slovic, 2000; Rusou et al., 2013), and the second refers specifically to the differences between verbal and non-verbal mental contents and the difficulty of expressing non-verbal content verbally (Schooler, 2002). According to the content explanation, transforming non-verbal mental content into verbalizations may disturb the judgment process because people may find it difficult to describe their experiences due to their lack of terminology, which may lead to the selection of preferences that are more easily explained (McGlone et al., 2005; McMackin & Slovic, 2000; Wilson & Schooler, 1991; Wilson et al., 1993).

The process explanation differentiates between analytic/featural and non-analytic/holistic thinking processes, and therefore relates to the contrast between analytic and intuitive thinking as it is presented by dual process theories that have become popular in recent decades. Dual process theories differentiate between System 1 of thought (often referred as intuitive or heuristic) and System 2 of thought (usually referred as analytic; Evans, 2008; Kahneman, 2003; Sloman, 1996; Stanovich & West, 2000; Weber & Johnson, 2009). The latter system is conscious, controlled, rule-following, analytic and deliberate, but its use requires effort, the system is slow, and it is only capable of serial processing. The functioning of the former process is automatic, fast, parallel, preconscious or unconscious and has evolved to produce adaptive behaviors in natural environments; however, this system can also cause people to make poor decisions in certain situations that require the analytic processing of decision alternatives (Kahneman, 2003; Stanovich & West, 2000; Weber & Johnson, 2009). It has been suggested that tasks requiring analytic thinking can be enhanced by introspection, whereas introspection is thought to have distracting effects in intuitive tasks (McMackin & Slovic, 2000; Rusou et al., 2013). The dual process theories imply that judgments made on perceptual stimuli are incongruent with verbal processing because they associate perception with intuition and verbal processing with analytical reasoning (Epstein, Pacini, Denes-Raj, & Heier, 1996; Hammond et al., 1987; Kahneman, 2003; McMackin & Slovic, 2000; Rusou et al., 2013): the impairing effect of verbalization results from verbalization making the judgment process more analytic or conscious and thus interfering with non-analytic or non-conscious processes that are more adaptive when, for example, weighing the separate attributes of decision alternatives. The reference to the dual process theories makes no clear distinction to whether the impairment is related to difficulties in transforming intuitive non-verbal content into verbalizations (Chin and Schooler's (2008) content account) or shifting to inappropriate analytic thinking when holistic thinking should be more adaptive (Chin and Schooler's (2008) process account). Thus the dual process accounts are less explicit about the reasons that verbalizations impair judgments and decisions.

Many researchers consider human decision making in everyday environments to be mostly automatic, non-conscious and, thus, intuitive (Bargh & Chartrand, 1999; Wegner & Wheatley, 1999; Wilson, 2003). It has also been suggested that the most efficient integration of information during judgment is achieved without deliberate, conscious processing (Dijksterhuis, 2004; Glöckner & Betsch, 2008b; Usher, Russo, Weyers, Brauner, & Zakay, 2011). This interpretation is in stark contrast with earlier accounts of decision making, which assumed that sophisticated decision strategies require considerable effort (Bettman, Luce, & Payne, 1998). Unlike the more traditional dual process models, theories emphasizing unconscious or automatic information processing argue that people are able to unconsciously apply computationally demanding strategies, such as the weight additive (WADD) strategy, to find the best alternative (Glöckner & Betsch, 2008b). Verbalization shifts processing into a more conscious mode, which interferes with more adaptive intuitive processes.

However, little research has been carried out on preferential visual judgments, particularly for tasks that employ well-defined multidimensional stimuli, therefore generalizations should be made cautiously. Several open questions remain. Are all judgments of visual targets non-analytic? Are all those judgments degraded by verbalizations? What happens if the visual judgment task is analytic in nature and the participants have a good knowledge of the relevant verbal concepts required by the task?

### 1.2. How analytic thinking benefits judgment

In many non-choice tasks, explanations provided during the task have been shown to enhance performance (Fox, Ericsson, & Best, 2011; Gagné & Smith, 1962; McGeorge & Burton, 1989; Stinessen, 1985). Explaining makes the thinking process more conscious and thus promotes logical thinking during the task (Baumeister, Masicampo, & Vohs, 2011). The decision tasks that benefit from explanations may be those that rely on conscious thinking, and the facilitation of conscious thinking can be attributed to the ability of language to guide thinking towards more analytical and logical styles thus making the decision criteria more explicit. Explicit separable criteria and the ability to think logically allow one to critically examine whether all possible attributes of the alternatives have been examined before making a decision. Moreover, requiring explanations for choices may also urge people before making a decision to deliberately examine all the available information (Lerner & Tetlock, 1999).

The use of voluntary attention is a significant part of certain perceptual tasks, for example visual search tasks (Schneider & Shiffrin, 1977). Visual features that are not sufficiently salient do not attract involuntary attention and thus require deliberate attention. It is also possible to consult long-term memory for information that has previously been used to determine choices. Thus, it is the acquisition of information during decision making that requires deliberate processing in the form of voluntarily focusing attention on all of the different aspects of the alternatives (Glöckner & Betsch, 2008a). Although the information integration process that leads to preference formation may be automatic, the quality of the preceding information acquisition process can be enhanced by conscious, deliberate control (Dijksterhuis, 2004; Glöckner & Betsch, 2008a). The core of this information acquisition process during analytical judgments consists of both reason generation, which transforms subjective impressions into words, and reason evaluation, which evaluates the validity of the arguments (Mercier & Sperber, 2011). The role of System 2 is not to generate reasons but rather to seek information upon which more reasons can be produced to improve decision making.

According to Kahneman (2003), the results of System 1's processes are subjectively manifested as impressions that are the products of implicit and automatic information integration which resembles perceptual categorization processes. However, first impressions are not always based on relevant attributes or on all of the relevant information, so inhibiting first impressions and searching for other impressions are needed for the improvement of decisions. According to some authors, this type of monitoring of the quality of one's responses may actually be the function of the analytic System 2 (Evans, 2006; Kahneman, 2003; Masicampo & Baumeister, 2008). As Bargh and Chartrand (1999) stated, humans are influenced by their surroundings automatically and continuously through perceptions because the senses cannot be shut down, and these perceptions usually have some kind of valence. The integration of this affective information directs humans to make automatic decisions continuously in their everyday environment. This notion suggests that when making our perceptual judgments, automatic evaluation is always the default, and more analytical judgments are employed only when the situation requires them.

When the visual judgment task combines participants' adequate vocabulary and separable multidimensional differences between alternatives that are not visible without a deliberative search, a more effortful, analytic and piecemeal approach may be more appropriate. In that case, proper vocabulary may give one a conceptual means to separate

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