Journal of Experimental Social Psychology 60 (2015) 1–7

Contents lists available at ScienceDirect

Journal of Experimental Social Psychology

journal homepage: www.elsevier.com/locate/jesp

The impact of a relational mindset on information distortion

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HIGHLIGHTS

- Generating solutions to cross-domain analogies activates a relational mindset.
- Predecisional information distortion increases when a relational mindset is activated.
- Construal level mediates the relationship between relational mindset and distortion.
- Cognitive effort moderates the relationship between relational mindset and distortion.

ARTICLE INFO

Article history:
Received 16 December 2014
Revised 23 April 2015
Accepted 26 April 2015
Available online 29 April 2015

Keywords:
Information distortion
Relational thinking
Construal level
Analogical thinking

ABSTRACT

The preference-supporting bias in information evaluation, known as information distortion, is a ubiquitous phenomenon. The present work demonstrates that priming a relational mindset induces individuals to process independent units of information interdependently and therefore contributes to increasing distortion. In three studies, a relational mindset is activated by asking participants to generate solutions to cross-domain analogies. All three studies show that the activation of a relational mindset then carries over into a second, unrelated choice task and increases distortion. In addition, the present work shows that generating solutions to cross-domain analogies activates a high level of construal, which in turn mediates the effect of relational thinking on information distortion. Finally, the present work also demonstrates that imposing a cognitive load during the choice task reduces the impact of the relational mindset on distortion. In sum, this research demonstrates that the same mechanism that promotes creative thinking (i.e., seeing relationships across concepts) may also induce more biased information processing by prompting individuals to process independent units of information interdependently.

Information distortion is a confirmation bias defined as the biased evaluation of new information to support an emerging preference or belief (Russo, Medvec, & Meloy, 1996). For instance, imagine that you are deciding between two vacation packages (Hotel A and Hotel B) and that you develop a tentative preference for Hotel A. Information distortion occurs if your emerging preference for Hotel A causes a shift in your evaluation of subsequent information toward favoring Hotel A. In other words, your evaluation of incoming information is biased toward your emerging preference.

To empirically determine the presence of information distortion, a method known as the stepwise evolution of preference (SEP) was developed by Russo et al. (1996). As above, consider a choice between two hotels, which would be described by several product attributes presented sequentially. To track the progress of the choice, participants provide two responses after reading each product attribute. First, they rate the diagnosticity of the information on a scale from 1 to 9, with 1 being "strongly favors Hotel A," 9 being "strongly favors Hotel B," and the midpoint of 5 being "favors neither hotel." Pretests are used to create neutral attributes that do not favor either product (i.e., 5 on the 9-point scale). As their second response, participants identify which is the leading alternative (Hotel A or Hotel B). To calculate distortion, the absolute difference between the perceived diagnosticity of the decision maker and the unbiased estimate of the control group is calculated. This absolute difference is signed positively if it is directed toward favoring the leading alternative and signed negatively if it favors the trailing alternative. The mean difference among all attributes yields a single value for each individual that is generally positive and thereby indicates the presence of distortion.

Nearly two decades of research on information distortion have demonstrated that its effects hold across populations (Carlson & Russo, 2001; Kostopoulou, Russo, Keenan, Delaney, & Douiri, 2012; Russo, Meloy, & Wilks, 2000) and across target categories (Russo, Meloy, & Medvec, 1998). Distortion has also been observed in a wide array of domains, such as gambling (Brownstein, Read, & Simon, 2004), jurors' verdicts (Carlson & Russo, 2001), wine selection (Carlson & Pearo, 2004), and professional auditing (Russo et al., 2000). Although prior research

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http://dx.doi.org/10.1016/j.jesp.2015.04.007
0022-1031/

has focused on the variety of contexts that favor the emergence of distortion, the question of the drivers of this bias has only recently arisen (Chaxel, Russo, & Wiggins, in press; Russo, Carlson, Meloy, & Yong, 2008). In the context of this literature, the general objective of this research is to provide insight into the cognitive mechanisms that are associated with predecisional information distortion.

1. The drivers of distortion

Recent research (Chaxel et al., in press; Russo et al., 2008) has demonstrated that information distortion is driven by the goal of cognitive consistency, that is, the desire for two beliefs to be consistent with one another. In the case of information distortion, the first belief is the emerging preference for one option over the other (generated by one's evaluation of prior information), and the second belief is the evaluation of new information.

Although this conceptualization of cognitive consistency as a goal and driver of distortion has recently received some attention, the present work takes a different path to studying the mechanisms underlying distortion, namely, examining the cognitive processes that are associated with the emergence of distortion. Prior research has demonstrated that "cognitive consistency" within belief systems is maintained through coherence-driven mechanisms of constraint satisfaction (e.g., Read & Miller, 1994; Simon & Holyoak, 2002; Spellman, Ullman, & Holyoak, 1993). These models predict how belief systems are modified by incoming information and how they eliminate potential inconsistencies. In this case, consistency is perceived not only as a desirable end-state (i.e., a goal) but also, even foremost, as a way to organize our thoughts and to integrate incoming information with our existing knowledge and preferences. In other words, cognitive consistency may not only be conceptualized as a goal but also refer to specific cognitive procedures that encourage decision makers to draw meaningful connections between beliefs (i.e., a "relational" procedure), such as between a preference and the evaluation of new information in a sequential choice task. In such a case, the relational procedure would encourage the presence of distortion because pieces of information would be evaluated in relation to other pieces of information ("interdependently") during the act of decision making.

To test the hypothesis that such a relational procedure may be associated with the emergence of distortion, the present work first relies on recent methodological work on mindset priming (for a review, see Wyer & Xu, 2010). In this study, we restrict the definition of the term "mindset" to a cognitive procedure that can be activated in one domain and can influence decision making in a different subsequent situation (Gollwitzer, 1990; Gollwitzer, Heckhausen, & Steller, 1990; Gollwitzer & Kinney, 1989; Xu & Wyer, 2012). For example, making comparative judgments in one domain can activate a "which-to-choose" mindset that disposes consumers to decide which of two products to buy in a subsequent situation without considering the possibility of buying neither product (Xu & Wyer, 2007, 2008). Similarly, we posit that it may be possible to activate a relational mindset in a first task and to observe whether this activation affects distortion in a subsequent unrelated task. Second, the present work also relies on recent empirical work on relational thinking (Vendetti, Wu, & Holyoak, 2014), which has shown that generating solutions for cross-domain analogies in a first task activates a relational mindset that induces decision makers to identify relationships between seemingly dissimilar items in a second task. In the work of Vendetti et al. (2014), the second task required participants to find more relational matches between two dissimilar pictures. In our work, we predict that solving cross-domain analogies in an initial task should contribute to increasing information distortion in a second, unrelated choice task by inducing participants to make connections between their emerging preference and their evaluation of new information in a sequential choice task.

2. Relational reasoning, creativity, and construal level theory

Prior research has demonstrated a close link between cross-domain analogical reasoning and creative thinking (Chan, Paletz, & Schunn, 2012; Dahl & Moreau, 2002; Holyoak & Thagard, 1995). The primary reason for such a close link is the property of cross-domain analogies that induces decision makers to make connections between ideas drawn from disparate domains, which subsequently fosters creative outputs. Therefore, the same relational mindset that may encourage creative thinking may also trigger information distortion, which requires making connections between one's prior preferences and the evaluation of new information.

In addition, prior research has emphasized that cross-domain analogical reasoning activates abstract thinking (Gick & Holyoak, 1983; Knowlton, Morrison, Hummel, & Holyoak, 2012) because cross-domain analogies require participants to find abstract relationships between disparate domains. Consider a within-domain analogy such as *nose:scent::tongue:taste*. The solution to this analogy requires the participant to map an identical relation within each pair of items (the nose is the sense organ for scent, and the tongue is the sense organ for taste). Now consider a cross-domain analogy such as *nose:scent::antenna:signal*. In contrast to the solution to the within-domain analogy, this cross-domain analogy requires the participant to draw an abstract relation between both pairs of items that will bridge both domains (the nose detects scent as an antenna detects a signal). Therefore, cross-domain analogical reasoning yields not only relational reasoning but also, more precisely, *abstract* relational reasoning.

Based on the relationships among cross-domain analogical thinking, abstract relational reasoning and creativity, this study proposes a link between the activation of a relational mindset and construal level theory (Liberman & Trope, 1998). Construal level theory posits that individuals represent psychologically distant events with abstract, general, high-level construals and represent psychologically near events with concrete, contextual, low-level construals (Liberman & Trope, 2008). In turn, a high level of construal activates holistic thinking (Smith & Trope, 2006) and fosters creativity by facilitating the association of distant concepts (Ward, 1995). Because solving cross-domain analogies requires "far-out thinking" (as named by Vendetti et al., 2014) by inducing people to draw abstract connections between semantically distant pairs of items, we propose that generating solutions to cross-domain analogies activates a high level of construal. As such, a relational mindset would induce more information distortion from participants in a choice task because of the adoption of a high-level, holistic, abstract type of reasoning. That is, the level of construal is proposed as a mediator of the relationship between the activation of a relational mindset and distortion.

3. Relational mindset and effort

A third objective of this research is to investigate whether cognitive effort is necessary for a relational mindset to affect distortion. That is, we investigate whether cognitive effort is a moderator of the relationship between relational mindset and distortion. This investigation is motivated by earlier research by Waltz, Lau, Grewal, and Holyoak (2000), who showed that imposing a cognitive load on analogical reasoning results in fewer relational mappings between two visual scenes. In other words, relational thinking is impaired under conditions of low effort (in contrast to baseline conditions). If relational thinking is impaired by a cognitive load and if relational thinking is associated with greater distortion, then information distortion should be lower when effort is manipulated to be low (i.e., when a cognitive load is imposed). The unexpected consequence of such a result is that distortion as a bias may be *less* likely to appear when cognitive effort is low, as long as a relational mindset is activated.

Interestingly, Polman and Russo (2012) showed that imposing a cognitive load leads to increased levels of distortion. However, this