Learning and Motivation 53 (2016) 36–48

Contents lists available at ScienceDirect

Learning and Motivation

journal homepage: www.elsevier.com/locate/l&m

Training in the mitigation of anchoring bias: A test of the consider-the-opposite strategy☆

Bradley J. Adame

The Hugh Downs School of Human Communication, Arizona State University, Stauffer Hall Building A, Room 466, P.O. Box 871205, Tempe, AZ 85287, United States

ARTICLE INFO

Article history:
Received 28 August 2015
Received in revised form
23 November 2015
Accepted 24 November 2015
Available online 18 December 2015

Keywords:
Anchoring Bias
Bias Mitigation
Training
Decision Making

ABSTRACT

Anchoring bias is a decision heuristic evidenced by skewed estimates made after an initial value is considered. The anchoring heuristic is both pervasive and powerful, affecting decision-making processes in many practical contexts. An experiment was conducted to test the effectiveness of both preexisting and new training techniques for mitigating anchoring bias, as well as to test a new type of anchoring bias inducing stimuli. Results show that the training module was effective in helping participants mitigate anchoring bias, and that the new stimuli were effective in eliciting anchoring bias in both high and low anchoring conditions. Additionally, the results provide theoretical evidence anchoring is due, at least in part, to semantic priming. Theoretical implications for the semantic priming and the revised adjustment explanation are discussed. Practical considerations for developing effective online and/or game-based training programs to mitigate the effects of overreliance on the anchoring heuristic are also discussed.

1. Online training in the mitigation of anchoring bias

Individuals' information processing has the potential to be skewed by an array of heuristics, or simple judgment rules, that can systematically bias cognitive processing and lead to erroneous decisions (Tversky & Kahneman, 1974). The Heuristic-Systematic Model (HSM) of information processing (Chaiken, 1980; Chen & Chaiken, 1999) posits that heuristic processing is characterized by using decision rules to reduce cognitive effort. The use of heuristics is highly adaptive in that they allow for quick decisions with minimal cognitive effort, which can be advantageous in times of scarce resources. While heuristics can save time and effort, overreliance on them, or a misapplication of them, can lead to serious and costly mistakes (Arkes, 1991). One such heuristic – the anchoring effect – has been shown to be particularly robust and pervasive (Furnham & Boo, 2011). The anchoring effect occurs when individuals make numerical estimates that integrate information from a previous comparison; evidence of the biased decision occurs in the form of judgments that are skewed toward the pre-judgment comparison (Tversky & Kahneman, 1974). This paper presents data from an experiment designed to test the efficacy of an online training module aimed at reducing individuals' propensity to rely on heuristic processing to make numerical estimations. The module includes two basic variations of an anchoring mitigation strategy with the objective that either design could be implemented in online bias training programs such as serious games. Games and online training are

☆ Research was conducted at this university.

E-mail address: badame@ou.edu

http://dx.doi.org/10.1016/j.lmot.2015.11.002
0023-9690/

becoming increasingly effective and popular methods for training individuals to mitigate bias in processing information and decision-making (Dunbar et al., 2013; Kohler, Haladjian, Simeonova, & Ismailovi, 2012; Mullinix et al., 2013).

1.1. Anchoring bias

In their initial investigation of anchoring bias, Tversky and Kahneman (1974) proposed that the anchoring effect is the result of inadequate adjustment of the estimate, relative to an initial value. To test this idea, participants were asked to estimate the percentage of African nations participating in the United Nations. Prior to estimation, participants were instructed to spin a rigged wheel of fortune, generating an ostensibly random value between zero and 100; values of either 10 or 65 were the manipulated results. Participants were asked whether they thought the percentage was higher or lower than wheel's number, and then asked to provide a specific numerical estimate. Overall, their estimates indicate systematic, directional distortions in judgments made after the initial consideration. Anchoring effects have been shown to be both powerful and pervasive, occurring in a variety of contexts and judgmental domains (see: Furnham & Boo, 2011; Mussweiler, 1997).

The anchoring effect occurs independently of individual personality and intelligence differences (Furnham, Boo, & McClelland, 2012), is exacerbated by negative emotion (Bodenhausen, Gabriel, & Lineberger, 2000), occurs independently of anchor plausibility (Mussweiler & Strack, 2001a), and is subject to prior target knowledge (Mussweiler & Strack, 2000a), among other moderating variables. Additional research has documented the nearly universal nature of this heuristic in a variety of contexts relating to decision-making and message processing, including but not limited to: credibility assessments (Elaad, 2003), risk communication (Joslyn, Savelli, & Nadav-Greenberg, 2011), criminal sentencing (Englich, Mussweiler, & Strack, 2006), negotiations (Galinsky & Mussweiler, 2001; Liebert, Smith, Hill, & Keiffer, 1968), and purchasing decisions (Ariely, Loewenstein, & Prelec, 2003).

Explanations of the anchoring effect, and its potential mediating variables, typically rely on one of two cognitive mechanisms: the anchoring and adjustment process, or the selective accessibility model (SAM). Tversky and Kahneman (1974) first proposed that individuals formulate estimates from the initial value and then make adjustments to arrive at an acceptable final answer; biased estimates occur from perpetually insufficient adjustment. In this scenario, the judge uses a known value as a cairn, which is then adjusted to a plausible answer (Epley, Keysar, Van Boven, & Gilovich, 2004; Furnham & Boo, 2011; Quattrone, 1982). Evidence suggests that anchoring-and-adjustment may be the principal underlying process when anchors are self-generated. Epley and Gilovich (2001) found that participants reported adjusting away from self generated anchors, but not from provided anchors. Research also shows that estimations dependent on self-generated anchors are influenced by incentives to be correct, and forewarnings of the potential for biased decisions (Epley & Gilovich, 2005). Additional research shows that judgment confidence may also be a factor in mitigating the effects of self-generated anchors (Simmons & Nelson, 2006). When anchors are provided for the individual making the estimations (externally generated), evidence suggests that the underlying cognitive processes may differ (Epley & Gilovich, 2001, 2004, 2005, 2006; Simmons, LeBoeuf, & Nelson, 2010).

The SAM (Mussweiler & Strack, 1999; Strack & Mussweiler, 1997) is an alternative explanatory mechanism for the anchoring effect. According to this model, biased estimates occur because the anchor triggers an increase in the accessibility of semantic knowledge that is then incorporated into the estimate. In other words, the anchor acts as a type of semantic prime, which the individual accesses when making a final estimate.

Bias resulting from anchoring, in this model, is dependent on two successive judgments: comparative, then absolute (Mussweiler & Strack, 1999). The comparative task requires a judge to associate the target with a particular standard; this serves as the anchor. The absolute task then involves making a discrete numerical estimation. Biased estimates occur when the individual integrates knowledge from the comparative assessment to the absolute estimate. Mussweiler, Forster, and Strack (1997; Study 1) found an anchoring effect for both plausible and implausible anchor values, providing evidence that the anchor serves as a prime, rather than an adjustment point (Furnham & Boo, 2011). Further, Mussweiler et al. (1997; Studies 2 and 3) demonstrate that anchoring effects are dependent on an effortful comparison. They argue that attending to the anchor primes semantic knowledge, which is then preferred due to its ease of accessibility, when assembling cognitive resources to make an estimate. Semantic priming has a significant effect on decision outcomes (Higgins, 1989). Priming works to activate associative memory structures, facilitating information retrieval, at least in the short term (Forster & Liberman, 2007). When making judgments under conditions of uncertainty, individuals are likely to use information that is most easily available to arrive at a final decision (Tversky & Kahneman, 1974).

Further research provides evidence that the anchoring effect is not due to adjustment errors when the anchor is externally generated. Mussweiler and Strack (2001b) find that anchoring effects are most pronounced when the two judgment tasks have the same target; when the anchor and target are different, the effect is attenuated. These results point to the use of semantic knowledge in making the final estimations, though effects can still be robust in the case of anchor-target differences (Tversky & Kahneman, 1974).

In response to conflicting evidence regarding anchoring's underlying cognitive mechanism, Simmons et al., (2010) offer a revised theory of anchoring which argues that the two explanations are not mutually exclusive, but rather, are complimentary. Their research found that when individuals are provided anchors and the estimate direction is not obvious, they tend to believe that their adjustments are too extreme (Studies 1a/b). They also found that enhancing accuracy motivation, and providing information on the direction of the adjustment, increased estimate adjustments away from the anchor (Study 2). This