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The anchor integration model: A descriptive model of anchoring effects [☆]



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ABSTRACT

Few experimental effects in the psychology of judgment and decision making have been studied as meticulously as the anchoring effect. Although the existing literature provides considerable insight into the psychological processes underlying anchoring effects, extant theories up to this point have only generated qualitative predictions. While these theories have been productive in advancing our understanding of the underlying anchoring process, they leave much to be desired in the interpretation of specific anchoring effects. In this article, we introduce the Anchor Integration Model (AIM) as a descriptive tool for the measurement and quantification of anchoring effects. We develop two versions the model: one suitable for assessing between-participant anchoring effects, and another for assessing individual differences in anchoring effects. We then fit each model to data from two experiments, and demonstrate the model's utility in describing anchoring effects.

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1. Introduction

As technology and innovation have brought a new age of intellectual prosperity, we find ourselves with a multitude of quantitative information. For years, psychologists have tried to understand how

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incidental numbers influence judgments. Anchoring effects were brought to the forefront of psychological research by Kahneman and Tversky (1974), although earlier examples of a similar phenomenon were demonstrated in previous research on preference reversals (Lichtenstein & Slovic, 1971; Slovic, 1967; Slovic & Lichtenstein, 1968). In their original article, Kahneman and Tversky first asked participants to indicate whether the percentage of African nations in the United Nations was greater than or less than an arbitrary number, derived from spinning a wheel of fortune. This arbitrary number, the anchor, was set to be either high (e.g., 65%) or low (e.g., 10%). Participants were then asked to give their best estimate of the percentage of African nations in the United Nations. Results indicated that participants' estimates assimilated to the provided anchor value, such that the mean estimate of participants in the high-anchor condition was 45% and the mean estimate of participants in the low-anchor condition was 25%.

Over the past forty years, anchoring research has received extensive attention because of its robust effect sizes and its broad applicability in a myriad of domains. One such example was provided by Northcraft and Neale (1987), in which students and real estate appraisers toured a home and appraised its value. Although each participant had relevant experiential information about the home, both groups showed a significant correlation between their appraisal and the anchor value. In another example, Plous (1989) demonstrated that students' estimates of the likelihood of nuclear war were significantly influenced by arbitrary anchors. Other common paradigms include the pricing of gambles (Carlson, 1990; Chapman & Johnson, 1994, 1999; Johnson & Schkade, 1989), self efficacy (Cervone & Peake, 1986), negotiations (Galinsky & Mussweiler, 2001), judicial verdicts (Chapman & Bornstein, 1996; Englich & Mussweiler, 2001; Englich, Mussweiler, & Strack, 2006), consumer decisions and willingness-to-pay (Ariely, Loewenstein, & Prelec, 2003; Green, Jacowitz, Kahneman, & McFadden, 1998; Simonson & Drolet, 2004; Stewart, 2009; Wansink, Kent, & Hoch, 1998), debt repayment (Navarro-Martinez et al., 2011; Stewart, 2009), and general knowledge questions (Jacowitz & Kahneman, 1995; McElroy & Dowd, 2007; Strack & Mussweiler, 1997).

1.1. *The problem with the anchoring effect*

Although it is clear that anchoring effects have widespread implications, less is known about the cognitive mechanisms that drive these effects. Over the past few decades, theories of the anchoring-effect mechanism have risen, but unfortunately, extant theories have not fallen. To be clear, having several non-mutually exclusive theories is acceptable, if not favorable, when there are multiple unique cognitive processes involved in the decision and it is clear under which conditions each theoretical mechanism plays a more versus less critical role in the decision process. We suggest that the anchoring literature lacks on this latter point, leaving researchers and practitioners with very little insight about which extant theory should apply to a given context, thereby limiting anchoring-effect predictions. Currently, there are five major theories – reviewed below – some with additional minor offshoots, that provide insight about how and why individuals assimilate judgments to presented anchor values. These theories provide psychological mechanisms that explain the processes underlying the anchoring effect and potentially relevant boundary conditions for the effect (for a review, see Furnham & Boo, 2011). Nevertheless, after 4 decades of research, what *exactly* do we know about the anchoring effect and how to predict it?

Anchoring effects often involve the presentation of a quantitative anchor, from which participants produce a quantitative response (although there are exceptions, e.g., Oppenheimer, LeBoeuf, & Brewer, 2008). Because the anchoring effect refers to the assimilation of a quantitative judgment to a quantitative anchor, qualitative theories are incapable of fully articulating the effect. In particular, extant theories provide considerable insight into the psychological processes that ostensibly produce the assimilation of individuals' judgments toward a presented anchor value, though they offer little insight into the magnitude of said assimilation. For example, consider a question in which participants are asked to estimate the length of the Mississippi river. Current theories provide qualitative predictions about how the presence of a high or low anchor will affect the shift of the judgments toward the anchor value, but they do not describe the distribution of these judgments. Hence, current theories of anchoring effects are incapable of making quantitative predictions for say, an anchor value of 3500 miles versus an anchor value of 1500 miles.

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