



# Holistic thinkers anchor less: Exploring the roles of self-construal and thinking styles in anchoring susceptibility



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## ABSTRACT

Anchoring, whereby people's numerical judgments assimilate to previously considered values, is one of the most robust phenomena in experimental psychology, and previous efforts to identify individual differences in susceptibility to anchoring have met with little overall success. In this study ( $N = 602$ ), we explored the roles of self-construal and thinking styles in anchoring susceptibility. We hypothesized that interdependent self-construal and more holistic thinking would predict stronger anchoring, whereas independent self-construal would predict weaker anchoring. Contrary to our predictions, no relation emerged between self-construal and anchoring susceptibility, and people with a more holistic thinking style actually anchored *less* than people with a more analytic thinking style.

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## 1. Introduction

People's numerical judgments often assimilate to *anchors*—relevant or irrelevant numerical values to which they have been previously exposed. For instance, people estimate that the percentage of African countries in the United Nations is higher after first judging if the percentage is more or less than 65 than after first judging if it is more or less than 10 (Tversky & Kahneman, 1974). Hundreds of studies have documented the surprising power of seemingly irrelevant anchors (for a review, see Furnham & Boo, 2011), and anchoring is considered to be one of the most robust findings in experimental psychology (Kahneman, 2011).

Anchoring effects are not limited to the laboratory. Research has revealed that anchors can influence the outcomes of negotiations (e.g., Galinsky & Mussweiler, 2001), credit card payments (Stewart, 2009), and jury decisions (Chapman & Bornstein, 1996). Moreover, even experts are susceptible to irrelevant anchors: judges (Englich, Mussweiler, & Strack, 2006) and doctors (Brewer, Chapman, Schwartz, & Bergus, 2007) also fall prey to anchors. Thus, anchoring effects are not only impressive experimental phenomena; they have potentially serious societal implications as well.

### 1.1. Individual differences in susceptibility to anchoring effects

Despite substantial interest in anchoring, researchers have only recently begun to investigate the role of individual differences in

susceptibility to anchoring effects, and previous research has largely failed to identify reliable predictors of the extent to which anchors influence people's judgments (though see Brandt, Evans, & Crawford, 2015). The majority of research so far has focused on the Big Five personality traits, and has yielded contradictory and inconclusive results, with studies reporting both conflicting results (e.g., Caputo, 2014; McElroy & Dowd, 2007) and many null results (e.g., Furnham, Boo, & McClelland, 2012). Studies examining more cognitive individual differences like intelligence have similarly failed to identify predictors of individual differences in anchoring susceptibility (e.g., Stanovich & West, 2008). Accordingly, in their recent review of anchoring, Furnham and Boo (2011) concluded: "It seems that researchers have failed to identify any cognitive or trait variables that have a systematic and explicable effect on anchored decisions" (p. 40). In the present research, we investigated two new potential predictors of anchoring susceptibility: self-construal and cognitive–perceptual thinking style.

### 1.2. Self-construal and analytic versus holistic thinking styles

A central finding in cultural psychology is that people vary in how they define the self in relation to others, and views of the self also vary within cultures (for a review, see Cross, Hardin, & Gercek-Swing, 2011). Markus and Kitayama (1991) distinguished between independent views of the self, which emphasize uniqueness and individual attributes, and interdependent views of the self, which emphasize social relationships and context. Previous research has demonstrated that people who define the self more interdependently attend more to context when making judgments than people who define the self more independently (e.g., Haberstroh, Oyserman, Schwarz, Kühnen, & Ji, 2002), and such differences in self-construal can predict susceptibility

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to biases when context is relevant to judgment (e.g., Krishna, Zhou, & Zhang, 2008). When context increases bias, people who view the self more interdependently may exhibit greater bias, whereas when context reduces bias, people who view the self more independently may exhibit greater bias (e.g., Krishna et al., 2008).

Cultural psychologists have also found that differences in thinking styles often follow patterns similar to those of self-definition. In addition to defining the self more interdependently, people from more collectivistic cultures tend to think more holistically, attending more to context and the field, rather than individual parts. In contrast, people from more individualistic cultures view the self more independently and think more analytically, attending more to specific elements, rather than the larger context as a whole (e.g., Choi, Koo, & Choi, 2007; Nisbett, Peng, Choi, & Norenzayan, 2001). Choi et al. (2007) recently demonstrated that thinking styles also vary within culture.

### 1.3. The present study

In the present study, we set out to investigate the roles of self-construal and thinking styles in susceptibility to anchoring. We predicted that people who define the self more interdependently and who have a more holistic thinking style would be more susceptible to anchoring effects, because, given that they focus more on context and see more connections among different elements, they may be more likely to consider the initial anchor values in relation to their subsequent judgments. In contrast, we predicted that people who define the self more independently and who have a more analytic thinking style would be less susceptible to anchoring effects because they would be less likely to connect anchor values to their subsequent judgments. Moreover, some perspectives on anchoring suggest that conversational norms strengthen anchoring effects (e.g., Zhang & Schwarz, 2013), and people who view the self more interdependently are more sensitive to conversational norms (Haberstroh et al., 2002), which further suggests that interdependent self-construal should predict stronger anchoring, whereas independent self-construal should predict weaker anchoring.

## 2. Method

### 2.1. Participants

Six hundred and two<sup>1</sup> workers on Amazon's Mechanical Turk participated as part of a larger study. Three hundred forty-three participants were male, 252 were female, and seven either did not identify as male or female or preferred not to answer. To have a 99% chance of detecting a small correlation of .2 with an alpha level of .05, a study would need to have 450 participants, so the current study is amply powered.

### 2.2. Materials

#### 2.2.1. Self-Construal Scales

To measure self-construal, we used Singelis' (1994) Independent and Interdependent Self-Construal Scales. The 12-item Independent Self-Construal Scale ( $\alpha = .75$  in the present study) measures the extent to which people define the self independently (e.g., "My personal identity independent of others is very important to me"), whereas the 12-item Interdependent Self-Construal Scale ( $\alpha = .80$  in the present study) measures the extent to which people define the self in relation to others (e.g., "I often have the feeling that my relationships with others are more important than my own accomplishments").

#### 2.2.2. Analysis–Holism Scale

To measure individual differences in thinking styles, we used Choi et al.'s (2007) 24-item Analysis–Holism Scale (AHS). The AHS ( $\alpha =$

.76 in the present study) yields a total score, reflecting overall differences in thinking styles, as well as four six-item subscales: Causality ( $\alpha = .85$  in the present study), which reflects the extent to which people see causal relationships among different things (e.g., "Everything in the universe is somehow related to each other"); Attitude Toward Contradictions ( $\alpha = .81$  in the present study), which reflects the tendency to hold contradictory or dialectical views (e.g., "We should avoid going to extremes"); Perception of Change ( $\alpha = .74$  in the present study), which reflects beliefs about patterns of change (e.g., "Current situations can change at any time"); and Locus of Attention ( $\alpha = .81$  in the present study), which reflects the extent to which people attend to the whole context versus individual elements (e.g., "The whole, rather than its parts, should be considered in order to understand a phenomenon"). Higher scores indicate a more holistic thinking style.

### 2.2.3. Anchoring susceptibility

Participants completed 11 anchoring tasks.<sup>2</sup> Each task comprised a comparative question (e.g., "Do you think the length of the Mississippi River is more or less than 200 miles?") followed by a second question asking participants to make an absolute estimate (e.g., "What do you think the length of the Mississippi River [in miles] is?"). The number in the first question served as the anchor for each task.<sup>3</sup> Participants were randomly assigned to all anchor conditions (i.e., low or high anchor) and completed the tasks in a random order. Prior to completing the anchoring tasks, participants received a message instructing them to give their best guesses rather than looking up information online.

Similar to previous researchers (e.g., Simmons, LeBoeuf, & Nelson, 2010), we computed an *anchoring score* as a measure of anchoring susceptibility using a three-step procedure. First, we calculated the absolute value of the difference between each estimate and the corresponding anchor. Next, we z-scored these values within each question and anchoring condition. Finally, we averaged the z-scored values for each participant to form an anchoring score that reflected the average distance between participants' estimates and the anchor values. Higher scores indicate that estimates were farther away from anchors and thus that less anchoring occurred.

## 3. Results

The correlations among the individual difference measures and anchoring scores are presented in Table 1. Contrary to our predictions, there was no relation between either independent self-construal or interdependent self-construal and susceptibility to anchoring. Also contrary to our predictions, there was a significant positive correlation between the AHS and anchoring scores ( $r = .10$ ), as well as a significant positive correlation between the Causality subscale of the AHS and anchoring scores ( $r = .11$ ), suggesting that participants with a more holistic thinking style were less susceptible to anchors than participants with a more analytic style. None of the other subscales of the AHS predicted anchoring scores.

Independent self-construal correlated positively with all but one of the AHS subscales. Although these correlations are smaller on average than the AHS-interdependent self-construal correlations, they are still surprising given previous findings that independent self-construal is related to more analytic thinking (Choi et al., 2007). Moreover, the Perception of Change subscale of the AHS showed unexpectedly weak correlations with the other AHS subscales, and was negatively correlated with interdependent self-construal, a pattern that again runs counter

<sup>2</sup> One additional anchoring task was administered, but it was not interpretable (because of a typo rendering the units of judgment unclear) and was thus excluded from all analyses.

<sup>3</sup> We determined anchor values by running a pilot study ( $N = 167$ ) on Mechanical Turk in which participants made estimates of each target value without exposure to an anchor. Following the recommendation of Jacowitz and Kahneman (1995), we selected the 15th and 85th percentiles of the distribution of pilot study estimates as the low and high anchor values, respectively.

<sup>1</sup> Because some participants did not complete all measures, sample sizes for correlations vary from 575 to 600.

**Table 1**  
Correlations among measures.

Measure	1	2	3	4	5	6	7
1. Anchoring score							
2. Independent SC	.02						
3. Interdependent SC	.03	.13**					
4. AHS Total	.10*	.20**	.23**				
5. AHS Causality	.11**	.23**	.15**	.64**			
6. AHS Contradictions	.01	.17*	.34**	.64**	.18**		
7. AHS Change	.06	-.05	-.18**	.33**	-.03	-.01	
8. AHS Attention	.03	.13*	.14**	.57**	.17**	.19**	-.14**

Note. Sample sizes for correlations vary from 575 to 600. SC = Self-Construal. AHS = Analysis–Holism Scale. Contradictions = Attitudes Toward Contradictions subscale of AHS. Change = Perception of Change subscale of AHS. Attention = Locus of Attention subscale of AHS.

\* =  $p < .05$ .

\*\* =  $p < .01$ .

to previous findings (Choi et al., 2007). Additionally, independent and interdependent self-construal were unexpectedly positively correlated (rather than uncorrelated; Singelis, 1994), perhaps because both scales reflect some degree of self-reflection or self-awareness (see, e.g., Fenigstein, 1987).

#### 4. Discussion

The results suggest that self-construal is not related to anchoring susceptibility and that people with a more holistic thinking style are actually somewhat less susceptible to anchoring than people with a more analytic thinking style. Although future research is needed to better explain the latter finding, one possibility is that because people with an analytic thinking style focus more on individual elements, they actually process anchor values in greater depth than people with a holistic thinking style, who may process anchors less deeply because they attend to the whole context rather than to specific elements. Previous research suggests that more thorough processing of anchors increases anchoring (e.g., Bodenhausen, Gabriel, & Lineberger, 2000), and thus differences in depth of processing may explain why holistic thinkers anchor less than analytic thinkers.

According to common guidelines (e.g., Cohen, 1992), the correlation between thinking style and anchoring susceptibility in the present study would be considered small. Previous research, however, has largely failed to identify reliable individual differences in anchoring (Furnham & Boo, 2011); accordingly, it may be that a correlation coefficient of .10 from a high-powered study represents a notable additional increment in variance explained even if the effect is small. Indeed, anchoring may be so powerful (Kahneman, 2011) that any reliable individual difference effects provide important information. Given the societal implications of anchoring (Kahneman, 2011), even relatively small effects may be important, especially if they occur repeatedly over time (Hemphill, 2003).

##### 4.1. Limitations and future directions

Although the scales we used to measure self-construal and thinking styles are among those most commonly used, their validity, especially that of the Self-Construal Scales, has been questioned (e.g., Levine et al., 2003). Furthermore, some of the results of the present study were surprising, such as the positive correlation between independent self-construal and the AHS. Thus, future research can help increase understanding of the relations among self-construal, thinking styles, and anchoring—for example, researchers could experimentally prime self-construal or thinking style before administering anchoring questions.

The results of the present study suggest that holistic thinkers anchor less in the standard anchoring paradigm, but future research could explore the influence of thinking styles on other forms of anchoring (e.g., self-generated anchors; Epley & Gilovich, 2001). Our results also highlight the potential utility of considering individual differences beyond broad traits, and future researchers may find more luck in identifying predictors of individuals' anchoring susceptibility by taking a wider view of personality that includes thinking styles, cognitive strategies, goals, and other constructs that go beyond the Big Five.

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#### References

- Bodenhausen, G. V., Gabriel, S., & Lineberger, M. (2000). Sadness and susceptibility to judgmental bias: The case of anchoring. *Psychological Science*, *11*, 320–323.
- Brandt, M. J., Evans, A., & Crawford, J. T. (2015). The unthinking or confident extremist? Political extremists are more likely than moderates to reject experimenter-generated anchors. *Psychological Science*, *26*, 189–202.
- Brewer, N. T., Chapman, G. B., Schwartz, J. A., & Bergus, G. R. (2007). The influence of irrelevant anchors on the judgments and choices of doctors and patients. *Medical Decision Making*, *27*, 203–211.
- Caputo, A. (2014). Relevant information, personality traits and anchoring effect. *International Journal of Management and Decision Making*, *13*, 62–76.
- Chapman, G. B., & Bornstein, B. H. (1996). The more you ask for, the more you get: Anchoring in personal injury verdicts. *Applied Cognitive Psychology*, *10*, 519–540.
- Choi, I., Koo, M., & Choi, J. A. (2007). Individual differences in analytic versus holistic thinking. *Personality and Social Psychology Bulletin*, *33*, 691–705.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, *112*, 155–159.
- Cross, S. E., Hardin, E. E., & Gercek-Swing, B. (2011). The what, how, why, and where of self-construal. *Personality and Social Psychology Review*, *15*, 142–179.
- Epley, N., & Gilovich, T. (2001). Putting adjustment back in the anchoring and adjustment heuristic: Differential processing of self-generated and experimenter-provided anchors. *Psychological Science*, *12*, 391–396.
- Fenigstein, A. (1987). On the nature of public and private self-consciousness. *Journal of Personality*, *55*, 543–554.
- Furnham, A., & Boo, H. C. (2011). A literature review of the anchoring effect. *The Journal of Socio-Economics*, *40*, 35–42.
- Furnham, A., Boo, H. C., & McClelland, A. (2012). Individual differences and the susceptibility to the influence of anchoring cues. *Journal of Individual Differences*, *33*, 89–93.
- Galinsky, A. D., & Mussweiler, T. (2001). First offers as anchors: The role of perspective-taking and negotiator focus. *Journal of Personality and Social Psychology*, *81*, 657–669.
- Haberstroh, S., Oyserman, D., Schwarz, N., Kühnen, U., & Ji, L. -J. (2002). Is the interdependent self more sensitive to question context than the independent self? Self-construal and the observation of conversational norms. *Journal of Experimental Social Psychology*, *38*, 323–329.
- Hemphill, J. F. (2003). Interpreting the magnitudes of correlation coefficients. *American Psychologist*, *58*, 78–79.
- Jacowitz, K. E., & Kahneman, D. (1995). Measures of anchoring in estimating tasks. *Personality and Social Psychology Bulletin*, *21*, 1161–1166.
- Kahneman, D. (2011). *Thinking, fast and slow*. New York: Farrar, Straus, and Giroux.
- Krishna, A., Zhou, R., & Zhang, S. (2008). The effect of self-construal on spatial judgments. *Journal of Consumer Research*, *35*, 337–348.
- Levine, T. R., Bresnahan, M. J., Lapinski, M. K., Wittenbaum, G. M. W., Shearman, S. M., Lee, S. Y., ... Ohashi, R. (2003). Self-Construal Scales lack validity. *Human Communication Research*, *29*, 210–252.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224–253.
- McElroy, T., & Dowd, K. (2007). Susceptibility to anchoring effects: How openness-to-experience influences responses to anchoring cues. *Judgment and Decision Making*, *2*, 48–53.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. (2001). Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, *108*, 291–310.
- Simmons, J. P., LeBoeuf, R. A., & Nelson, L. D. (2010). The effect of accuracy motivation on anchoring and adjustment: Do people adjust from provided anchors? *Journal of Personality and Social Psychology*, *99*, 917–932.
- Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, *20*, 580–591.
- Stanovich, K. E., & West, R. F. (2008). On the relative independence of thinking biases and cognitive ability. *Journal of Personality and Social Psychology*, *94*, 672–695.
- Stewart, N. (2009). The cost of anchoring on credit-card minimum repayments. *Psychological Science*, *20*, 39–41.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124–1131.
- Zhang, Y. C., & Schwarz, N. (2013). The power of precise numbers: A conversational logic analysis. *Journal of Experimental Social Psychology*, *49*, 944–946.