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Short Communication

Individual differences in anchoring susceptibility: Verbal reasoning, autistic tendencies, and narcissism

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ABSTRACT

Hundreds of studies have documented anchoring, whereby people's numerical judgments assimilate to previously considered values. Much less is known, however, about individual differences in susceptibility to anchoring effects. In this study ($N = 399$), we found that people with stronger verbal reasoning skills and people higher in social autistic tendencies were less influenced by anchors, whereas people higher in narcissism were more influenced by anchors. Although relatively small, these relations contribute to the integration of the judgment and decision making literature on anchoring with personality and individual differences approaches to cognition.

1. Introduction

Anchoring, whereby people's numerical judgments assimilate to previously considered values, is among the "most reliable and robust effects in psychology" (Kahneman, 2011, p. 119). Indeed, hundreds of studies have shown that experts and novices alike are vulnerable to even seemingly irrelevant anchors (e.g., Englich et al., 2006; Tversky & Kahneman, 1974). Despite the breadth of research, however, surprisingly few studies have identified reliable predictors of individual differences in anchoring susceptibility. The present research aimed to help fill this gap.

Because they are often related to more accurate or careful reasoning, need for cognition (the tendency to engage in and enjoy thinking) and intelligence may be expected to relate to anchoring susceptibility, such that those higher in both are less susceptible (Furnham & Boo, 2011). For instance, people with stronger verbal reasoning skills may be less susceptible to anchoring because they are better at identifying and ignoring irrelevant information (e.g. Bergman et al., 2010). Yet, previous research has found no relation between need for cognition and anchoring (Epley & Gilovich, 2006; Welsh et al., 2014), and inconsistent relations between intelligence and anchoring effects (e.g., Bergman et al., 2010; Welsh et al., 2014).

Research on individual differences in anchoring, however, has been criticized (Cheek & Norem, 2018, 2020) for relying on insufficiently powered designs and flawed methodologies. These limitations might explain previous null effects and inconsistencies. Here, we reexamined the relation between anchoring susceptibility and need for cognition and verbal reasoning in a high-powered study with a more sensitive methodological approach.

We also explored novel potential predictors of anchoring susceptibility. First, we investigated whether individual differences in autistic tendencies in the subclinical range of personality related to anchoring. We predicted that more social autistic tendencies (i.e., not enjoying, understanding, or paying attention to people and social interactions; Baron-Cohen et al., 2001) would predict weaker anchoring effects, because previous research suggests that anchoring results in part from conversational implicature and pragmatic inference (Grice, 1975; Zhang & Schwarz, 2013), and people with more social autistic tendencies are less likely to attend to pragmatic information (Shelton et al., 2012).

Second, we investigated whether grandiose narcissism related to anchoring. Narcissism may predict weaker anchoring because more confident people tend to reject provided anchors more than less confident people (Brandt et al., 2015), but it may also predict stronger anchoring because narcissists, in their overconfidence, may not thoroughly identify, ignore, or adjust away from irrelevant information (Littrell et al., 2020). Accordingly, we made no specific directional prediction about the role of narcissism in anchoring susceptibility.

2. Method

Materials, data, and code for the present study are available through the Open Science Framework: https://osf.io/mgfvw/.

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2.1. Participants

Previous research suggests that relations between anchoring susceptibility and individual differences tend to be small (Brandt et al., 2015; Cheek & Norem, 2017). Accordingly, we aimed to achieve a final sample after exclusions of at least 345 participants in order to have an 80% chance of detecting a small effect of $r = 0.15$ with $\alpha = 0.05$. To be included in analyses, participants had to pass an instructional manipulation check (Oppenheimer et al., 2009), answer at least four of six anchoring questions,[1] and confirm that they did not look up any information online while participating. We recruited 418 participants from Amazon's Mechanical Turk, of whom 399 met these inclusion criteria (see supplemental material for participant demographics).

2.2. Materials

2.2.1. Personality measures

We measured need for cognition with Cacioppo et al.'s (1984) Need for Cognition Scale ($\alpha = 0.95$) and verbal reasoning with the Vocabulary Scale of the Shipley Institute of Living Scale ($\alpha = 0.85$; Zachary, 1986). We measured social autistic tendencies using the Social subscale (measuring social interest and attention to others' intentions or needs; $\alpha = 0.83$) and Communication subscale (measuring conversational tendencies like speech clarity, politeness, and attention to social norms; $\alpha = 0.69$) of the Autism Spectrum Quotient (AQ; Baron-Cohen et al., 2001). We used the Narcissism Scale from the Short Dark Triad ($\alpha = 0.85$; Jones & Paulhus, 2014) to measure narcissism.[2] See supplemental material for sample items from and descriptive statistics for these measures.

2.2.2. Anchoring susceptibility

Participants completed six anchoring tasks (see Table 1), each comprising a comparative question containing a numerical anchor (e.g., "Do you think the maximum speed of a housecat is more or less than 8 [30] miles per hour?"),[3] followed by a second question prompting participants to make an absolute estimate (e.g., "What do you think the maximum speed of a house cat [in miles per hour] is?"). Participants completed the six tasks in a random order and were randomly assigned to an anchor condition (i.e., high- or low-anchor) for each task. Prior to completing the anchoring tasks, participants read a message asking that they not look up information online.

Following the recommendation of Cheek and Norem (2018), we computed an *anchoring score* by first taking the absolute value of the difference between each estimate and its corresponding anchor value, then z-scoring each value within each question and condition, and finally averaging the z-scored values for each participant (e.g., Simmons et al., 2010). Higher values indicate that estimates were farther away from anchor values and hence that participants were *less* susceptible to anchoring.

3. Results

3.1. Preliminary analyses

Before our main analyses, we examined individual estimates for each of the anchoring tasks to check for possible outliers (Cheek & Norem, 2020). To be an outlier, an estimate had to be clearly implausible (e.g., 1,000,000 countries in the United Nations), look noticeably discontinuous on a histogram, and be identified as an outlier based on Iglewicz and Hoaglin's (1993) criteria. We excluded 32 individual estimates (1.34% of 2394 total possible estimates from the 399 participants). This exclusion did not prevent any additional participants (who had to answer at least four anchoring tasks) from being included in analyses. Because some participants did not fully complete all measures, final sample sizes for correlations between anchoring scores and individual difference measures range from 380 to 399. As can be seen in Table 1, anchoring occurred for all six tasks.

3.2. Main analyses

Correlations among individual difference measures and anchoring scores are presented in Table 2. Need for cognition did not relate to anchoring susceptibility. Verbal reasoning was positively related to anchoring scores, such that people with higher reasoning scores anchored less (reflected in larger anchor-estimate gap scores). Narcissism was negatively correlated with anchoring scores, such that people who were more narcissistic anchored more (reflected in smaller anchor-estimate gap scores).

Our predictions about the role of autistic tendencies in anchoring susceptibility were partially supported. Social autistic tendencies were positively correlated with anchoring scores, such that participants with more social autistic tendencies anchored less (reflected in larger anchoring scores). Scores on the Communication subscale of the AQ, however, were unrelated to anchoring.

4. Discussion

The present research advances the literature on individual differences in anchoring susceptibility and provides insight into theories of reasoning and anchoring. The relation between verbal reasoning and anchoring is consistent with theorizing that cognitive abilities help people to correct the influence of external anchors, at least under some circumstances (Bergman et al., 2010; Simmons et al., 2010). The relation between social autistic tendencies, meanwhile, is consistent with pragmatic accounts of anchoring that posit that anchoring effects emerge in part because people (over)interpret anchor values as informative based on understandings of conversational logic (Zhang & Schwarz, 2013). The Social subscale, measuring interest in others and their mental states, may especially relate to pragmatics. Research suggests that narcissists may not carefully monitor their judgments for biasing influences (Littrell et al., 2020), and our finding that higher narcissism was related to greater anchoring susceptibility is consistent with this perspective. Finally, the lack of relation between need for cognition and anchoring is consistent with previous findings (Epley & Gilovich, 2006), and suggests that, at least in the standard anchoring paradigm used here, need for cognition is unlikely to predict anchoring (see Simmons et al., 2010, for discussion of paradigm features).

Because there are many different mechanisms that may cause anchoring (e.g., insufficient adjustment, priming, selective accessibility, scale distortion; see Furnham & Boo, 2011), any one individual difference is unlikely to explain a large portion of the variance in anchoring susceptibility. On one hand, it may be that the small correlations of $r = 0.11$ suggest that verbal reasoning and social autistic tendencies provide relatively little insight into anchoring susceptibility. On the other hand, given both previous difficulty in identifying *any* reliable predictors of anchoring susceptibility (Furnham & Boo, 2011) and the fact that effects can compound over time (Hemphill, 2003), even small effects may be meaningful, particularly given the ubiquity of anchoring effects in everyday judgment (Kahneman, 2011).

Future work should explore other potential predictors of anchoring susceptibility, such as cognitive reflection or need for closure. Future work can also disentangle the unique effects of each individual predictor in the present research by, for example, using experimental paradigms or conducting larger-scale research that affords sufficient power for multiple regression approaches. Additionally, we relied on an online

[1] Imprecise answers such as "I don't know" or "less than 500" were considered invalid.

[2] Participants completed additional measures unrelated to the present research questions (see supplemental material for details).

[3] Anchor values were those used by Cheek and Norem (2017), which were generated following Jacowitz and Kahneman's (1995) recommendations.

Table 1
Anchoring effects in the six anchoring tasks.

Estimate	Low anchor condition			High anchor condition			*t*	*r*
	Anchor	*M*	*SD*	Anchor	*M*	*SD*		
Members in the United Nations	18	86.70	70.89	193	183.87	62.17	14.39	0.59 [0.52, 0.65]
Babies born per day in U.S.	300	1703.41	2283.90	67,500	59,848.81	34,698.93	20.55	0.78 [0.73, 0.82]
Maximum speed of house cat	8 mph	12.26	7.18	30 mph	19.21	8.66	8.71	0.40 [0.32, 0.48]
Gas used per month by average American	28 gal.	44.15	21.34	200 gal.	167.79	149.04	11.50	0.50 [0.43, 0.57]
Winter temperature of Antarctica	−50 °F	−45.38	30.03	10 °F	−7.29	19.71	14.70	0.60 [0.53, 0.66]
Year of telephone invention	1830	1869.07	33.89	1915	1898.57	20.11	10.55	0.47 [0.39, 0.54]

Note. All p values $< .001$. 95% confidence intervals of effect sizes (r's) provided in brackets.

Table 2
Correlations among measures.

	1	2	3	4	5
1. Anchoring score					
2. Need for cognition	0.04 [−0.06, 0.13]				
3. Verbal reasoning	0.11 [0.01, 0.20]	0.13 [0.03, 0.23]			
4. AQ social	0.11 [0.01, 0.21]	−0.16 [−0.25, −0.06]	0.12 [0.02, 0.21]		
5. AQ communication	0.00 [−0.10, 0.10]	−0.26 [−0.35, −0.17]	−0.07 [−0.17, 0.03]	0.59 [0.52, 0.65]	
6. Narcissism	−0.14 [−0.24, −0.05]	0.25 [0.16, 0.34]	−0.21 [−0.30, −0.12]	−0.57 [−0.63, −0.50]	−0.30 [−0.38, −0.20]

Note. AQ = Autism Spectrum Quotient. $p < .05$ for $|r| > 0.10$.

sample of U.S. participants, and thus future work should attempt to replicate the present study in other, especially non-Western, cultural contexts. These future directions will further expand our knowledge of who is more or less likely to succumb to the power of anchoring.

CRediT authorship contribution statement

Nathan N. Cheek (supported by a National Science Foundation Graduate Research Fellowship) and **Julie K. Norem** (supported by the Margaret Hamm Research Fund) conceived and executed the study and wrote and revised the manuscript.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2021.111212.

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