Research Report

SADNESS AND SUSCEPTIBILITY TO JUDGMENTAL BIAS: The Case of Anchoring

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Abstract—*In a wide range of empirical paradigms, sadness has been associated with more extensive and detail-oriented thinking than happiness, resulting in reductions in judgmental bias that arise from reliance on stereotypes and other simple decision heuristics. It was hypothesized that anchoring would constitute a significant exception to this general pattern. Recent research on anchoring indicates that an active thought process underlies the emergence of this bias. If sad people are likely to think more actively about the judgmental anchor than their neutral-mood counterparts, their subsequent judgments should be more likely to be assimilated toward this reference point. This prediction was confirmed in two experiments demonstrating that sad people are indeed more susceptible to anchoring bias than are people in a neutral mood. Moreover, this effect generalized over judgments in positive, neutral, and negative content domains.*

Processes of judgment and choice rarely occur in an affective vacuum. More typically, the obligation to make decisions occurs in the context of a variety of preexisting moods and spontaneous emotional reactions. An understanding of the dynamics of judgment and choice thus requires careful attention to the role played by affective states (e.g., Damasio, 1994). As the empirical base addressing this issue has grown in recent years, some interesting general principles have emerged. It appears that individuals in happy moods often rely on heuristics and generic knowledge structures in making judgments, in the absence of specific goals that require more extensive information processing; sad moods, in contrast, appear to be characterized by more extensive, detail-oriented information processing strategies (for reviews, see Forgas, 1995; Schwarz, 1998; Sinclair & Marks, 1992). For example, happy moods produce greater reliance on stereotypes (Bless, Schwarz, & Kemmelmeier, 1996; Bodenhausen, Kramer, & Süsser, 1994), scripts (Bless, Clore, et al., 1996), persuasion heuristics such as source credibility (e.g., Mackie & Worth, 1989), and other simplistic judgmental strategies such as the availability heuristic (Isen & Means, 1983). In contrast, sad moods are associated with more systematic processing of case information, rather than reliance on stereotypes (e.g., Bodenhausen, Sheppard, & Kramer, 1994; Edwards & Weary, 1993), analysis of argument quality rather than reliance on simple credibility heuristics (Bless, Bohner, Schwarz, & Strack, 1990), and judgments that are generally more accurate (Alloy & Abramson, 1979; Sinclair, 1988). As Schwarz (1998) put it,

> Across many person perception tasks, individuals in a chronic or temporary sad mood have been found to make more use of detailed individuating information, to show less halo effect . . . and to be more accurate in performance appraisals than individuals in a happy mood, with individuals in a neutral mood falling in between. (p. 246)[1]

Findings such as these indicate that compared with happy persons, sad persons may be generally less susceptible to common biases and shortcomings of human inference and judgment, presumably because of their tendency toward more extensive processing of judgment-relevant information. Why should this be the case? Research by Weary and colleagues (e.g., Weary, 1990; Weary & Gannon, 1996) indicates that greater sensitivity to social information emerges because of the sad person's need to regain a sense of predictability and control over the environment. By paying careful attention to the social environment, the sad person can master its contingencies more effectively. Related reasoning has been proposed by Schwarz (1990), who argued that affective states inform the perceiver about the state of the world and the cognitive requirements of managing that state. When a person is deliberating about a judgment or decision, a positive mood may confer a sense of confidence in initial assessments. In the absence of situational inducements for accuracy, happy judges may thus be content to stop deliberating rather quickly and go with their quick, "top of the head" reactions. Sad people, in contrast, may lack confidence in their initial assessments and may thus feel motivated to pay more extensive attention to judgment-relevant data. Evidence consistent with these assumptions has accumulated in diverse judgmental contexts.

The tendency to think more extensively may protect sad people from many information processing biases, but perhaps not all. Anchoring is one of the most robust and pervasive forms of judgmental bias. In the anchoring bias, final judgments are assimilated toward the starting point of the judge's deliberations (even when the starting point is totally arbitrary). In one famous demonstration (Tversky & Kahneman, 1974), judges were asked to estimate the percentage of African nations in the United Nations. Prior to doing so, they indicated whether the value was higher or lower than a numerical value determined by the spin of a wheel. Final estimates were lower when the initial comparative judgment involved a smaller numerical value, compared with cases in which the comparative judgment involved a higher (albeit arbitrary) value. Although anchoring effects of this sort have been widely documented, until recently the underlying cognitive mechanisms responsible for the bias were not clear. New evidence has prompted the development of a *selective-accessibility model* to account for anchoring effects (Mussweiler & Strack, 1999, in press; Strack & Mussweiler, 1997; see also Chapman & Johnson, 1999).

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1. Not all negative moods exert the same effects on information processing. Sadness exerts effects that are distinct from those of anger (e.g., Bodenhausen, Sheppard, & Kramer, 1994; Keltner, Ellsworth, & Edwards, 1993) and anxiety (e.g., Raghunathan & Pham, 1999). Moreover, the effects of transitory sadness or mild depression are quite distinct from those of major depression, which is typically accompanied by anxiety, anger, guilt, or some combination of these affective states (e.g., Lazarus, 1991).

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According to this model, when judges are given a starting value to contemplate, they begin by testing the hypothesis that this value is the correct response. This hypothesis-testing process is typically biased in a confirmatory direction (e.g., Klayman & Ha, 1987; Sanbonmatsu, Posavac, Kardes, & Mantel, 1998), resulting in the increased mental accessibility of hypothesis-consistent information (Koehler, 1991).

This kind of theoretical model has interesting implications regarding the susceptibility of sad people to anchoring biases. Specifically, it suggests that this is one type of bias that sad people should be more susceptible to than others are. The more extensively judges test the veracity of the initial anchor value, the more anchor-consistent information they are likely to generate. Because sad people typically do engage in more extensive deliberations than other people, a greater proportion of information that is consistent with the implications of the anchor value is likely to become selectively accessible when they make an initial comparative judgment. As a result, their final absolute estimates should be biased more strongly in the direction of the anchor than are the estimates of others. The experiments reported here were designed to test the hypothesis that in anchoring, in contrast to many other judgmental domains, sad people are more susceptible to biases than their neutral-mood counterparts.

EXPERIMENT 1

Method

Participants and design

Seventy undergraduates (58.6% females) participated in partial fulfillment of a course requirement. Each student was randomly assigned to either the sad- or the neutral-mood condition.

Materials and procedure

Participants were told that there would be two unrelated experiments. The first experiment (actually the mood induction) was characterized as a study of memory, and the second (the anchoring task) was characterized as a study of decision making. Participants completed these tasks individually in a private room.

Mood was manipulated via an idiosyncratic memory-elicitation procedure (see Strack, Schwarz, & Gschneidinger, 1985). In the neutral-mood condition, participants were asked to recall the mundane events of the previous day. In the sad-mood condition, participants were instructed to recall and vividly reexperience a prior event that had made them feel very sad. They were asked to write about this event in as much concrete detail as possible. Ten minutes were allotted for this task.

When they had finished the memory task, participants were told that the first experiment was over. They then completed a "participant background questionnaire" that was said to be part of the second study. This questionnaire included, among many other items, a mood-manipulation check. Specifically, participants rated (on a scale from 0 to 9) the degree to which they were feeling happy. Next, directions for the decision-making task were provided. Participants were told that they would be asked to make judgments in a range of real-world knowledge domains (e.g., the length of the Mississippi River). For each target item, they were asked first to make a binary comparative judgment, in which they judged the item relative to an anchor value (e.g., "Is the Mississippi River longer or shorter than 5,000 miles?"). They were then asked to provide an absolute estimate of the target item (e.g., "How long is the Mississippi River?"). They were explicitly told that the number provided for each comparative judgment was randomly chosen and should not be assumed to have any relation to the correct answer. In actuality, each anchor value was set at approximately 1 standard deviation above or below the mean absolute estimate previously provided by 15 independent students. Participants were given 12 diverse target items to judge, 6 with high anchors and 6 with low anchors. Direction of anchors was counterbalanced across participants.

After completing the anchoring task, participants were given a set of humorous cartoons to read, in order to restore a more positive mood. Then they were thanked and debriefed.

Results and Discussion

Manipulation check

Participants rated themselves as being significantly less happy in the sad condition than in the neutral condition (Ms = 4.60 vs. 6.26, respectively), $t(68) = 3.81$, $p < .001$.

Anchoring effects

If sad people expend more cognitive effort than their neutral-mood counterparts in making comparative judgments involving an anchor value, then they should ultimately show a stronger anchoring bias in their subsequent absolute estimates. To test this idea, we first standardized participants' absolute numerical estimates and then combined them into two composites, one for the six high-anchor items and another for the six low-anchor items. These values were entered into an analysis of variance (ANOVA) in which mood (sad vs. neutral) was a between-subjects factor and anchor (low vs. high) was a within-subjects factor.[2]

There was a very strong anchoring bias, with the low anchors resulting in substantially lower estimates than the high anchors (Ms = −.38 vs. .37), $F(1, 68) = 93.83$, $p < .001$. More important, the magnitude of this bias was significantly moderated by mood, $F(1, 68) = 4.28$, $p < .05$. As expected, the anchors exerted a stronger effect on the sad participants. In the low-anchor condition, sad participants gave lower estimates than neutral-mood participants (Ms = −.44 vs. −.32, $p < .05$); in the high-anchor condition, sad participants gave higher estimates than neutral-mood participants (Ms = .47 vs. .27, $p < .08$). Given recent evidence that anchoring biases arise from the selective activation of anchor-consistent information in memory during the comparative judgment task (Mussweiler & Strack, in press), and given sad people's proclivity to engage in more extensive information processing during this task, this pattern is exactly as expected.

EXPERIMENT 2

In line with several other theorists, we have argued that sadness is associated with more extensive information processing than happy or neutral moods are. However, there is reason to believe that sad people will differ not only in their cognitive style, but also in the content or substance of their thinking. Specifically, several studies suggest a pattern of mood-congruency bias in judgments (see Bower, 1991), so that sad people are more likely to attend to and think about negative

2. In both experiments, there were no effects of participants' sex.

material than positive material. If so, then the subject matter about which participants are making judgments may be important in determining their relative susceptibility to anchoring biases. Alternatively, if sad people feel a general uncertainty about their judgments, they may exert more cognitive effort regardless of the subject matter, in an effort to feel more confident. In the first experiment, the subject matter of the estimation task varied unsystematically, and many items were affectively neutral (e.g., the length of the Mississippi River or the birth year of Ernest Hemingway). In the second experiment, we selected for the estimation task items that clearly had positive or negative affective tone.

Method

Participants and design

Fifty-one undergraduates (54.9% females) participated in partial fulfillment of a course requirement. Each student was randomly assigned to either the sad- or the neutral-mood condition. Participants made numerical estimates in both positively and negatively valenced content domains, with some target items accompanied by high anchor values and others accompanied by low anchors. Thus, the experiment consisted of a 2 (mood) × 2 (item valence) × 2 (anchor) design, with the last two factors being varied within-subjects.

Materials and procedure

The procedures used in this experiment were identical to those of the first experiment. The only modification was in the selection of items for the anchoring task. Six of the items presented to participants in the estimation task were from negative content domains (e.g., suicide rates, drunk-driving deaths), and six were from positive content domains (e.g., amount of charitable contributions, daily rate of laughing). Valence of the items was confirmed in a pretest sample from the same population. The pretest was also used to set the high and low anchor values at approximately 1 standard deviation above or below the pretest mean. Half the items of each valence (in counterbalanced fashion) were associated with high anchors, and the rest had low anchors.

Results and Discussion

Participants' absolute estimates were standardized and combined into four composites: low anchor with positive items, high anchor with positive items, low anchor with negative items, and high anchor with negative items. An ANOVA revealed a robust main effect of anchor (Ms = −.31 vs. .35 for low vs. high anchors), $F(1, 49) = 69.35$, $p < .001$. This effect was again significantly contingent upon mood, $F(1, 49) = 3.95$, $p < .05$. Specifically, anchoring bias was significantly larger among sad persons (in this case, principally when the anchor value was high[3]). When anchors were low, there was no difference between sad and neutral-mood participants' estimates (Ms = −.32 vs. −.31); when anchors were high, sad participants reported higher estimates than neutral-mood participants (Ms = .51 vs. .19, $p < .025$). This interaction was not further qualified by the valence of the item, $F(1, 49) = 0.22$, n.s. Thus, the tendency for sad persons to be more swayed by anchor values than neutral-mood counterparts generalizes across positive, neutral, and negative content domains.

The only other significant effect in the analysis was the interaction of item valence with anchor value, $F(1, 49) = 10.63$, $p < .005$. This interaction is due to the greater influence of the anchor values for positive items than for negative ones. Specifically, participants gave lower estimates in response to items with positive content than in response to items with negative content in the low-anchor condition (Ms = −.44 vs. −.19, $p < .01$), and they gave higher estimates for items with positive content than for items with negative content in the high-anchor condition (Ms = .47 vs. .23, $p < .05$). Although this finding was not specifically predicted, it makes a good deal of sense if one assumes that people prefer to think more about positive than negative topics. If one accepts this highly plausible assumption, the selective-accessibility account of anchoring bias clearly implies a larger anchoring bias for positive topics than for negative ones.

GENERAL DISCUSSION

These findings have several noteworthy implications. First, they document a seemingly rare instance in which sad mood is associated with a greater degree of judgmental bias. Whereas sadness has typically been linked to more extensive deliberation and greater accuracy (Alloy & Abramson, 1979; Schwarz, 1998), the tendency to think more does not always pay dividends of greater accuracy. In the context of the anchoring phenomenon, thinking more about the provided reference value leads to greater assimilation of estimates to the anchor (cf. Mussweiler & Strack, in press). The present results further bolster the selective-accessibility account of anchoring bias by showing that conditions that lead to greater thought about the anchor (in this case, sadness and positive content domains) also produce greater bias. By the same token, variables that undermine the extensiveness of thinking should reduce the magnitude of anchoring. Given that positive mood has been linked to more cursory cognitive styles (e.g., Bodenhausen, Mussweiler, Gabriel, & Moreno, in press; Schwarz, 1990), it should be associated with less anchoring bias, and that appears to indeed be the case (Estrada, Isen, & Young, 1997).

These findings may appear to be at odds with research suggesting that mildly depressed persons are less susceptible to primacy effects in impression formation than nondepressed persons are (e.g., Gannon, Skowronski, & Betz, 1994). However, the impression-formation paradigm involves asking respondents to attend to a set of explicitly presented evidence (and determining whether the serial position of information affects its influence on judgments). The greater information processing diligence of depressives should lead them to be less susceptible to primacy effects in this kind of situation. In the anchoring paradigm, however, sequential judgments are required, with the impact of the first, comparative judgment carrying over to the subsequent absolute judgment. We have argued that greater information processing diligence during the comparative judgment results in the heightened accessibility of a larger set of anchor-consistent knowledge. Anchor-inconsistent information is not explicitly presented, nor is its activation required in order to complete the comparative judgment. If sad judges were explicitly presented with anchor-inconsistent information, they would likely make more extensive use of it than would neutral-mood judges.

The greater susceptibility of sad people to anchoring bias has a great deal of practical significance as well. Anchoring has been ob-

3. For a discussion of asymmetric anchoring effects of this sort, see Jacowitz and Kahneman (1995).

served in a number of important contexts, including legal judgment (Chapman & Bornstein, 1996), medical decision making (Shiloh, 1994), and judgments of self-efficacy (Cervone & Peake, 1986), among others. The present findings suggest that sadness and mild depression can lead to a greater vulnerability to arbitrary anchor values that are introduced in these (and other) consequential domains.

As we learn more about the connections between feeling and thinking, it appears that simple conclusions will be elusive. Sadness may be associated with protection from many forms of judgmental bias, but clearly there are significant exceptions. Although these exceptions may complicate researchers' understanding, they follow theoretically meaningful and predictable patterns. Sad people's tendency to think more extensively is thus both a blessing and a curse. It protects them against biases arising from superficial analysis while at the same time creating a greater susceptibility to biases arising from thinking too much about potentially arbitrary or insignificant details, such as the anchors used in the present experiments.

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