

## Sentencing Under Uncertainty: Anchoring Effects in the Courtroom<sup>1</sup>

BIRTE ENGLICH<sup>2</sup>

*Research Institute for Public Administration  
at the German Post-Graduate School  
of Administrative Sciences  
Speyer, Germany*

THOMAS MUSSWEILER

*Universität Würzburg  
Würzburg, Germany*

Research on juridical decision making has demonstrated that largely disparate sentences are often given for identical crimes. This may be the case because judges' sentencing decisions are influenced by a recommended or demanded sentence. Building on research on judgmental anchoring (Tversky & Kahneman, 1974), the present investigation examines whether a sentencing demand has a direct influence on a given sentence. Using criminal trial judges as participants, Study 1 demonstrates that such a direct influence does, in fact, exist. Sentencing decisions are assimilated to the sentence demanded by the prosecutor. Study 2 further reveals that this influence is independent of the perceived relevance of the sentencing demand. Study 3 demonstrates that this influence is also independent of judges' experience.

There is nothing so finely perceived and so finely felt, as injustice.  
— Charles Dickens, *Great Expectations*

As Dickens' statement indicates, people care a great deal about receiving just treatment. Consequently, societies have established elaborate legal systems to ensure justice. However, evidence is accumulating that this objective is not always met. For instance, the very same legal case may lead to largely disparate sentences if evaluated by different judges (e.g., Austin & Williams, 1977; Ebbesen & Konecni, 1981; Hogarth, 1971). Thus, offenders who have committed identical crimes may receive remarkably different sentences. The search for possible sources of such sentencing disparities (for an overview, see Wrightsman, Nietzel, & Fortune, 1994) has focused primarily on specific attributes of the judge, such as his or her experience (Myers, 1988), political affiliation (Nagel,

<sup>1</sup>The present research was supported by a grant from the German Science Foundation (DFG, grant number 264/17-1). We would like to thank Fritz Strack for his helpful suggestions concerning this research.

<sup>2</sup>Correspondence concerning this article should be addressed to Birte English, Psychologie II, Universität Würzburg, Röntgenring 10, D-97070 Würzburg, Germany. e-mail: english@psychologie.uni-wuerzburg.de

1962), and attitude about the purpose of punishment (Gottfredson, Gottfredson, & Conly, 1989).

In addition to these personal characteristics, however, one reason for the existence of sentencing disparities may be inherent in the sentencing situation itself. Specifically, sentencing decisions often must be made in situations of judgmental uncertainty. In fact, uncertainty is likely to be more the rule than the exception because sentencing decisions are typically rather complex and must make use of inherently ambiguous information (Saks & Kidd, 1980). Research on the general processes underlying judgment and decision making (for a review, see Kahneman, Slovic, & Tversky, 1982) has demonstrated that in such situations of judgmental uncertainty, people often resort to simplifying heuristics (Tversky & Kahneman, 1974), which are beneficial under most circumstances, but which may also lead to characteristic distortions (e.g., Arkes, 1991). Therefore, it seems likely that sentencing decisions are also subject to these biases and distortions.

One of the classic judgmental biases—called the *anchoring effect*—is apparent in the fact that numeric estimates are assimilated to a previously considered standard. In what is probably the best known demonstration of this effect, Tversky and Kahneman (1974) first asked their research participants whether the percentage of African nations in the United Nations is higher or lower than an arbitrary number (the anchor) that had been determined ostensibly by spinning a wheel of fortune (e.g., 65% or 10%). Participants were then asked to give their best estimate of this percentage. Estimates were assimilated to the provided anchor value, so that the mean estimate of participants who received the high anchor was 45%, compared to 25% for participants who received the low anchor (see Mussweiler & Strack, 1999a, for a review of the anchoring literature).

Anchoring effects like these influence human judgment and decision making in a multitude of natural settings (e.g., Mussweiler, Strack, & Pfeiffer, 2000; Northcraft & Neale, 1987; Russo & Schoemaker, 1989). For example, Northcraft and Neale demonstrated that judgmental anchoring influences pricing decisions. Specifically, they had a group of real-estate agents estimate the value of a house. Participants were given all of the information that is important to make this estimate (e.g., major characteristics of the property, prices for neighboring properties) and had the opportunity to see and inspect the house. Although relevant information was thus easily accessible, participants were dramatically influenced by the presented listing price (i.e., the anchor). Similarly, Mussweiler et al. demonstrated that estimates for the value of a used car were strongly influenced by a suggested anchor value.

Furthermore, there is reason to believe that anchoring not only influences inexperienced laypeople but also may be a potent bias in judgments of experts. Previous research (e.g., Joyce & Biddle, 1981; Mussweiler et al., 2000; Northcraft & Neale, 1987; Wright & Anderson, 1989) has demonstrated that even experienced experts are influenced by a salient anchor value. For instance,

the estimates of experienced real-estate agents (Northcraft & Neale, 1987) and car mechanics (Mussweiler et al., 2000) were assimilated to the provided anchors.

In sum, these findings indicate that anchoring is a pervasive and robust effect in human judgment that reliably influences numeric estimates in a variety of natural settings. Because criminal sentencing decisions typically pertain to numeric quantities (i.e., a prison term or a fine), these findings suggest that anchoring also may be influential in this problem domain. Furthermore, this bias is likely to influence even experienced judges. From this perspective, judgmental anchoring constitutes one possible explanation for sentencing disparities: To the extent that judges use different judgmental anchors to make their sentencing decisions, the resulting sentences are likely to differ.

Natural settings typically provide decision makers with a host of potentially influential anchors (Whyte & Sebenius, 1997). In sentencing decisions, a sentence that is demanded by a prosecutor or attorney or recommended by a probation officer is likely to constitute one potent anchor. In fact, there exists some initial evidence suggesting that sentencing decisions may be influenced by such anchors (e.g., Chapman & Bornstein, 1996; Ebbesen & Konecni, 1981; Martin & Alonso, 1997). Specifically, analyses of sentence hearings and court files (e.g., Ebbesen & Konecni, 1981; Martin & Alonso, 1997) demonstrate that the final sentence tends to be close to the one that is demanded by the prosecutor (Martin & Alonso, 1997) or recommended by the probation officer (Ebbesen & Konecni, 1981).

These findings hint at the fact that a demanded or suggested sentence may serve as an anchor to which the final sentence is assimilated. Although suggestive of this possibility, however, this evidence does not demonstrate a direct influence of the demanded sentence. Specifically, the real-life cases that were used in these analyses differ not only with regard to sentencing demand, but also to an infinite number of other legally relevant factors (e.g., the severity of the crime, criminal record of the defendant). As a consequence, the observed relation may well be caused by differences in the crime itself, rather than in the sentencing demand. For example, a prosecutor may demand a higher sentence in one case than in another because the two cases differ with regard to the degree of violence that was involved. If the judge's sentencing decision is consistent with the prosecutor's demand, this may be the case because his or her decision is directly influenced by the demand or because it is influenced by differences in the severity of the crime. In principal, there exist an infinite number of legally relevant factors (i.e., severity of the crime, criminal record, victim's behavior) with regard to which any two given cases can differ. Consequently, it is impossible to control for their influence on the sentencing decision and thus to demonstrate a direct influence of the demanded or recommended sentence. In order to do so, one must provide judges with identical cases that differ only with respect to the sentencing demand.

In the present research, we will use this strategy to explore whether judges' sentencing decisions are directly influenced by a demanded sentence. Specifically, Study 1 examines whether evaluating different sentencing demands of a prosecutor influence the sentencing decisions of criminal judges.<sup>3</sup> Based on our theoretical analysis, such an influence may be conceptualized as an anchoring effect (Tversky & Kahneman, 1974). Doing so allows us to apply our knowledge about the determinants of anchoring to the realm of sentencing decisions. The literature on judgmental anchoring suggests that a salient anchor is influential, even if it is clearly irrelevant for the judgment at hand (e.g., Tversky & Kahneman, 1974). Study 2 applies this insight to the case of sentencing decisions and examines whether the influence of a demanded sentence depends on its perceived relevance. Finally, Study 3 explores whether anchoring effects in sentencing decisions are indeed independent of judges' experience, as anchoring research (Northcraft & Neale, 1987) suggests.

The major objective of the present research is to demonstrate that sentencing demands can serve as anchors to which a final sentence is assimilated. In addition, the present research attempts to shed some light on the psychological processes that produce anchoring effects in applied settings. Anchoring constitutes a multiply determined phenomenon (for a discussion, see Mussweiler & Strack, 1999a), and although recent research (e.g., Mussweiler & Strack, 1999b, 2000a; Strack & Mussweiler, 1997) has specified the processes that underlie anchoring effects in more controlled laboratory settings, little is known about the processes that contribute to anchoring effects in the real world.

### Study 1

To examine whether judges' sentencing decisions are influenced by a demanded sentence when other potential influences (e.g., severity of the crime, defendant's criminal record) are controlled for, we gave participating criminal judges identical materials describing a hypothetical case of alleged rape. In this scenario, we varied the prosecutor's sentencing demand. Specifically, for half of the participants, the prosecutor demanded a prison confinement of 2 months; for

<sup>3</sup>The findings of Ebbesen and Konecni (1981) suggest that, in many cases, the sentencing recommendation of the probation officer constitutes a more potent anchor than the prosecutor's demand. Thus, an alternative strategy to examine a direct influence on sentencing decisions is to vary the probation officer's recommendation. The present study, however, was conducted in Germany, where such recommendations are not given. In the German legal system, judges are typically not advised by probation officers, but make their sentencing decisions independently. As a consequence, manipulating the probation officer's recommendation was not possible in our studies. Given that the primary concern of the current research is whether sentencing decisions are directly influenced by a demanded or recommended sentence, however, the specific source of the demand is negligible. Because anchoring has proved to be a very robust and ubiquitous phenomenon, similar findings may be expected if the probation officer's recommendation rather than the prosecutor's demand is manipulated.

the other half, he demanded a sentence of 34 months. If judges' sentencing decisions are directly influenced by the prosecutor's demand, shorter sentences should be given in the first case than in the second case.

### Method

*Participants.* We recruited 19 German trial judges (15 male, 4 female) as participants and randomly assigned them to one of two experimental conditions. Men and women were equally distributed across experimental conditions. On average, the participants were 29.37 years old ( $SD = 2.11$ ) and had 9.34 months ( $SD = 10.52$ ) of experience in their jobs. The participants were approached during a seminar on stress management in court and were asked to take part in a study on juridical decision making. The experiment was conducted in one group session that included all 19 participants.

*Materials and procedure.* Participants were first handed the case material, along with copies of the relevant passages from the penal code. They were instructed to thoroughly work through this material and to form an opinion about the case.

The case materials were four pages long and consisted of brief descriptions of the incident; the victim ("Sabine K.") and the defendant ("Peter F."); the opinions of a medicolegal and a psycholegal expert; and statements by the victim, the defendant, and two witnesses. Participants took about 15 min to study these materials. The materials included all of the information (e.g., psychological consequences for the victim, resistance of the victim, threats by the assailant) that has been found to be important to allow for an ascription of guilt in cases of rape (Krahé, 1991). To further ensure that the materials were realistic and included all of the necessary information, they were designed in close collaboration with several experienced trial judges. Specifically, these judges worked through the materials and supplemented them with information they thought to be necessary to determine a sentence until they deemed the material to be complete.

The materials pertained to a case of an alleged rape: Sabine K. and Peter F. get to know each other at a party and start flirting passionately. They drink a few glasses of wine together. At the end of the party, Peter offers to give Sabine a ride home, but then takes her to a nearby forest instead of her apartment. In spite of Sabine's resistance, Peter attempts to have sex with her and finally penetrates her, which the victim experiences as rape. In the end, Peter takes Sabine back home.

These case materials were pretested using 24 senior law students as participants. After going through the materials, these participants were instructed to determine a sentence for the defendant. The average prison term was 17.21 months ( $SD = 10.09$  months). Based on the results of this pretest, the high and

low sentencing demands for the main study were determined. Both deviated by about 16 months from the mean of the sentences given by pretest participants. Specifically, 2 months and 34 months served as sentencing demands.

After participants had formed an opinion about the case, they were handed the critical questionnaire (while keeping the case materials). Here, about half of the participants were first told that the prosecutor demanded a sentence of 34 months for the defendant, while the other half was told that he demanded a sentence of 2 months. They were then instructed to indicate whether this sentence was too low, adequate, or too high. Subsequently, participants were asked to indicate the sentence that they would give if they were the judge in the described case.<sup>4</sup> Using a 9-point rating scale ranging from 1 (*very uncertain*) to 9 (*very certain*), they were then asked to indicate how certain they were about this sentencing decision. Finally, to assess the appropriateness of the case materials, participants were asked how realistic the described case was on a 9-point scale ranging from 1 (*not at all realistic*) to 9 (*very realistic*).

### Results

*Preliminary analysis.* An analysis of the final question revealed that participants judged the case materials to be appropriate. Specifically, the majority of participants saw the case as realistic ( $M = 7.17$ ,  $SD = 1.30$ ). Furthermore, this assessment did not depend on the demand condition,  $t(17) < 0.20$ ,  $p > .80$ .

*Sentencing decisions.* As expected, the given sentences were higher for participants who evaluated the high sentencing demand ( $M = 28.70$  months,  $SD = 6.53$ ) than for participants who evaluated the low sentencing demand ( $M = 18.78$  months,  $SD = 9.11$ ),  $t(17) = 2.75$ ,  $p < .01$ , one-tailed.<sup>5</sup>

*Certainty ratings.* Participants' certainty about their sentencing decisions ( $M = 4.53$ ,  $SD = 2.29$ ) was independent of the demand condition,  $t(17) = 1.50$ ,  $p > .15$ . More importantly, judged uncertainty did not influence the effect of the demanded sentences: Entering certainty as a covariate did not weaken the effect of demand on sentencing.

### Discussion

These data indicate that judges' sentencing decisions were dramatically influenced by the prosecutor's demand. In fact, final sentences differed by 10

<sup>4</sup>Note that this sequence closely resembles typical legal procedures in Germany. In contrast to the American legal system, where the sentence is determined in a separate sentence hearing after the actual trial, German judges typically announce the sentence at the end of the trial. Thus, conviction and sentencing are not formally separated.

<sup>5</sup>Note that none of the judges gave a sentence of 0 months. This indicates that all of the judges saw the defendant as guilty.

months. These results are consistent with previous findings that demonstrate that in real-life sentencing decisions, the final sentence tends to be close to a recommended or demanded sentence (e.g., Ebbesen & Konecni, 1981; Martin & Alonso, 1997). However, because the present research controlled for other possible mediators of this effect (e.g., differences in the actual severity of the crime), our findings are the first experimental demonstration of a direct influence of a sentencing demand on judges' sentencing decisions. Thus, they provide strong support for the notion that judges use the sentencing demand as an anchor in making their sentencing decisions.

One may well argue that in real-life sentencing decisions, using the prosecutor's demand as a judgmental anchor is a viable strategy. For one, prosecutors are legal experts who have thoroughly studied the given case and can thus provide a legally competent opinion. Moreover, they may be more knowledgeable about the specifics of the case than is the judge. In this situation, judges may see the prosecutor's demand as valuable information that they readily incorporate in their sentencing decisions. From this perspective, judges' sentencing decisions would be influenced by the prosecutor's request because it is seen as a relevant and informative indicator of an appropriate sentence.

However, conceptualizing the observed influence as an anchoring effect suggests that judges' sentencing decisions may be influenced not only by a relevant or informative anchor. In fact, research on anchoring effects in other problem domains has repeatedly demonstrated that anchors that are clearly irrelevant for the critical judgment because they are implausibly extreme (e.g., Chapman & Johnson, 1994; Mussweiler & Strack, 1999b; Strack & Mussweiler, 1997) or selected at random (Cervone & Peake, 1986; Mussweiler & Strack, 2000a; Switzer & Sniezek, 1991; Tversky & Kahneman, 1974) still exert an effect. Anchor values determined by spinning a wheel of fortune (Tversky & Kahneman, 1974), rolling dice (Mussweiler & Strack, 2000a), drawing a card (Cervone & Peake, 1986), or simply selecting the experiment number (Switzer & Sniezek, 1991) can hardly be interpreted as providing relevant information for the critical judgment. Still, they produce reliable effects on judgment.

Applying these findings to the realm of the present investigation suggests that judges' sentencing decisions may be influenced by a requested sentence, even if it is less likely to provide relevant information for the critical judgment. Study 2 was designed to test this possibility. To do so, we had half of our participants evaluate the sentencing demand of a legal layperson. For them, it was not a prosecutor who demanded a specific sentence, but a first-year computer-science student. Because this person had neither expertise in legal affairs nor additional knowledge about the case, his demand should be seen as less relevant to find a legally appropriate sentence than the demand of the prosecutor. However, the anchoring literature suggests that judges will still anchor their sentencing decisions on the demanded sentence.

## Study 2

## Method

*Participants.* Senior German law students (32 male, 12 female) in their final year before graduation were recruited as participants and were randomly assigned to one of four experimental conditions. Men and women were equally distributed across experimental conditions. On average, they were 27.56 years old ( $SD = 2.17$ ). Participants were approached in the university cafeteria and were asked to take part in a study on juridical decision making.

*Materials.* The case materials were identical to Study 1. However, we changed some aspects of the central questionnaire. First, the low sentencing demand was set at 12 months instead of 2 months. Some of the participants in Study 1 had indicated that for the given case, a prosecutor's demand of 2 months seemed too low. Thus, 34 months and 12 months served as sentencing demands. Half of the participants received the high demand, while the other half received the low demand. Moreover, we included the sentencing demand of the defendant's attorney in the questionnaire. Specifically, participants were told that the attorney demanded an acquittal for his client and were asked whether they found this demand appropriate or too low.<sup>6</sup> The attorney's demand was kept constant for all conditions and was introduced after participants had evaluated the prosecutor's demand (i.e., immediately before giving the sentence). Finally, to assess the perceived relevance of the demands of the prosecutor and the computer-science student, who took the role of the prosecutor, participants were asked to indicate whether or not this demand was relevant for the sentencing decision.

In line with the previous reasoning, half of the participants were instructed to evaluate the demand of a prosecutor. The other half, however, was told that the same scenario had been given previously to a number of computer-science students. Thus, it was clear that these students had the same information available as did the judges themselves. It was pointed out that these students had been instructed to take the role of the attorney and the prosecutor. In the role of the prosecutor, a first-year computer-science student had demanded a sentence of 12 months (or 34 months) of prison confinement. Participants were asked whether they thought that this sentence was too low, appropriate, or too high. In sum, the four experimental conditions resulted from an orthogonal combination of sentencing demand (high vs. low) and relevance of the sentencing demand (high vs. low).

<sup>6</sup>Note that because in German legal practice the questions of guilt (i.e., conviction) and penalty (i.e., sentencing) are settled in parallel during the same trial, the attorney's demand of an acquittal is reasonable.

Table 1

## Mean Sentences by Sentencing Demand and Relevance

Sentencing demand	Relevance	
	High	Low
High	25.91	22.91
Low	19.09	16.18

*Note.* Sentences are given in months.  $N = 11$  for all cells.

Table 2

## Number of Participants Who Judged the Prosecutor's Demand to Be Relevant Versus Irrelevant for Their Sentencing Decision by Relevance

Relevant?	Relevance	
	High	Low
No	13	20
Yes	8	2

## Results

*Preliminary analysis.* Again, the majority of participants judged the case to be realistic ( $M = 7.49$ ,  $SD = 1.60$ ). This assessment did not depend on the demand condition,  $F(1, 40) < 1$ .

*Sentencing decisions.* As the means depicted in Table 1 indicate, participants gave higher sentences after evaluating the high sentencing demand of 34 months ( $M = 24.41$ ,  $SD = 9.00$ ) than after evaluating the low demand of 12 months ( $M = 17.64$  months,  $SD = 7.86$ ),  $F(1, 40) = 6.96$ ,  $p < .01$ . This effect did not depend on whether this demand was made by a prosecutor or by a computer-science student,  $F(1, 40) = 1.32$ ,  $p > .25$ , for the main effect of relevance and  $F(1, 40) < 1$  for the interaction. Moreover, contrast analysis reveals that for both relevance conditions, the high sentencing demand yielded higher sentences than did the low demand,  $t(40) > 1.85$ ,  $p < .035$ , one-tailed, for both contrasts.<sup>7</sup>

*Relevance judgments.* One participant was excluded from this analysis because he did not answer the critical question that assessed perceived relevance. Table 2 reveals that for both relevance conditions, the majority of participants

<sup>7</sup>Again, all of the participants saw the defendant as guilty.

indicated that the demanded sentence was not relevant for their sentencing decisions. However, the proportion of participants who saw the demand as relevant was higher when this demand was made by a prosecutor than when it was made by a computer-science student,  $\chi^2(1, N = 43) = 5.06, p < .02$ .

*Certainty ratings.* Participants' certainty about their sentencing decisions ( $M = 5.55, SD = 1.87$ ) was independent of the anchoring condition,  $F(1, 40) < 1$ , for all effects. More importantly, entering certainty as a covariate did not weaken the effect of demand on sentencing. This suggests that certainty did not influence our findings.

### Discussion

These findings demonstrate that the degree to which judges anchor their sentencing decisions on a demanded sentence does not depend on the perceived relevance of this demand. Although almost all of the participants judged the demand of the computer-science student to be irrelevant for their judgments, their sentencing decisions were assimilated to this demand. In fact, the size of this anchoring effect was comparable to that obtained for participants who received the more relevant demand of the prosecutor. Thus, anchoring in sentencing decisions appears to be independent of the perceived relevance of the anchor. Note also that these findings are the first to demonstrate that irrelevant anchors can produce an effect in an information-rich applied setting.

One factor that may influence the extent to which a judgment is assimilated to a salient anchor, however, is judges' experience. One may well argue that the more experienced judges are, the less likely they are to resort to a salient anchor in making their sentencing decisions. In fact, the literature on judgmental anchoring is consistent with this assumption. Specifically, it has been demonstrated that more pronounced anchoring effects result for participants who have little knowledge (e.g., Wilson, Houston, Etling, & Brekke, 1996) or who are highly uncertain about the critical judgment (Jacowitz & Kahneman, 1995). To the extent that experienced judges are more knowledgeable and less uncertain, these findings suggest that they may be less susceptible to anchoring bias. However, previous anchoring research has also demonstrated that participants with considerable experience were susceptible to anchoring (e.g., Mussweiler et al., 2000; Northcraft & Neale, 1987). Thus, it remains unclear whether the effects that we demonstrated in the first two studies would hold also for more experienced judges.

Note that although we used legal experts as participants in Studies 1 and 2, one may argue that these experts were fairly inexperienced in making actual sentencing decisions. In fact, we used judges in their first working year as participants in Study 1 and law students in their final year of law school in Study 2. To examine the role of experience, in Study 3 we used trial judges with an average of more than 15 years of experience in their jobs.

### Study 3

#### Method

*Participants.* We recruited 16 trial judges (12 male, 4 female) from one regional superior court (Landgericht) in Germany as participants and randomly assigned them to one of two experimental conditions. On average, they were 44.6 years old ( $SD = 11.56$ ) and had worked as judges for 15.40 years ( $SD = 10.64$ ). Participants were recruited by first contacting the head of the court, who agreed to collaborate on the study. Case materials and questionnaires were then distributed to the affiliated judges who were invited to participate in a study on juridical decision making.

*Materials and procedure.* We used the same case materials as in the preceding studies. The central questionnaire was identical to the one used in the low-relevance condition of Study 2. Thus, all of the participants were asked to evaluate the demand of a computer-science student in his first year, who had taken the role of the prosecutor in the described case. As in Study 2, for half of the participants, this demand was 34 months; while for the other half, it was 12 months. Participants were sent the case materials and the central questionnaire, along with general instructions. In the instructions, they were told to form an opinion about the case before answering the questionnaire.

#### Results

*Preliminary analysis.* As in the previous two studies, participants judged the case materials to be realistic ( $M = 7.87, SD = 1.26$ ). Again this assessment did not depend on the demand condition,  $t(14) = 1.20, p > .20$ .

*Sentencing decisions.* As in Studies 1 and 2, the given sentences were higher when participants evaluated the high demand ( $M = 35.75$  months,  $SD = 10.82$ ) than when they evaluated the low demand ( $M = 28.00$  months,  $SD = 6.76$ ),  $t(14) = 1.72, p < .05$ , one-tailed.<sup>8</sup>

Comparing these sentences with those given by the law students of Study 2, who also received the sentencing demand of the layperson (Table 1), reveals that the experienced judges who participated in Study 3 gave higher sentences in both demand conditions,  $F(1, 34) = 15.64, p < .001$ , for the main effect of experience. More importantly, however, the amount of anchoring did not differ for the two groups,  $F(1, 34) < 1$ , for the interaction of demand and experience. Furthermore, analyzing the experience of the judges who participated in Study 3 as a continuous variable by regressing years of experience on the sentencing decisions indicates that experience does not influence the obtained effects ( $\beta = 0.01, p > .90$ ).

<sup>8</sup>As in the previous studies, all of the participants saw the defendant as guilty.

*Certainty judgments.* Participants were highly certain about their sentencing decisions ( $M = 8.06$ ,  $SD = 1.06$ ). Moreover, judged certainty neither depended on the demand condition, nor did it influence the effects of anchoring: Entering certainty as a covariate did not weaken the anchoring effect.

Comparing these certainty ratings with those given by the corresponding participants of Study 2 demonstrates that the experienced judges who participated in the present study were more certain about their judgments ( $M = 8.06$  vs. 5.41),  $F(1, 34) = 22.33$ ,  $p < .001$ .

*Relevance judgments.* Only one of the participants judged the demand of the computer-science student who took the role of the prosecutor to be relevant for his or her sentencing decision. Thus, 93% of the judges saw this demand as irrelevant.

### Discussion

These results indicate that even judges with an average of more than 15 years of experience in making criminal sentencing decisions are influenced by what they judge to be an irrelevant sentencing demand. Moreover, comparing the sentences with those given by participants in the low-relevance condition in Study 2 (who received the identical material) reveals that the size of the anchoring effect is similar for both groups. That is, the degree to which the experienced judges of Study 3 were influenced by the sentencing demand does not seem to be different from the one apparent in the judgments of comparatively inexperienced law students. This suggests that anchoring effects in sentencing decisions do not depend on judges' experience.

Although the experienced judges were similarly susceptible to the anchoring bias, they stated that they were more certain about their judgments. Comparing the certainty ratings with those given by participants in the low-relevance condition in Study 2 demonstrates that the experienced judges of Study 3 were considerably more certain. Thus, the level of certainty appears to be independent of the actual size of the judgmental bias. This interpretation is also consistent with the supplementary analyses of Studies 1 and 2, in which controlling for certainty did not influence the anchoring effect. Thus, in contrast to earlier findings (e.g., Jacowitz & Kahneman, 1995), the current results demonstrate that anchoring effects may be independent of judges' certainty about their judgment.<sup>9</sup>

<sup>9</sup>One obvious difference between the current paradigm and that used in previous research in which anchoring was found to depend on participants' certainty (e.g., Jacowitz & Kahneman, 1995) pertains to overall level of certainty. Specifically, participants are likely to be more certain about sentencing decisions than about answers to fairly difficult general-knowledge questions (e.g., amount of meat eaten per year by the average American). Thus, one may speculate that judged certainty only moderates the anchoring effect if the overall level of certainty is fairly low.

### General Discussion

In the present research, we have investigated the role that judgmental anchoring plays in juridical sentencing decisions. The results of Studies 1, 2, and 3 indicate that evaluating an initial sentencing demand heavily influences the final sentence that is given by the judge. Thus, the prosecutor's demand may exert a strong influence on the given sentence (Study 1). This finding constitutes the first demonstration of a direct influence of a demanded sentence on judges' sentencing decisions. Notably, this influence appears to be independent of the perceived relevance of the initial sentencing demand. That is, even when the demand is seen as irrelevant because it stems from a person who has no legal expertise (e.g., the computer-science student used in the present research), the given sentence is assimilated to this demand (Study 2). Finally, this effect appears to be independent of judges' experience. Specifically, experienced judges who are highly certain about their sentencing decisions are also influenced by a sentencing demand that they judge to be irrelevant (Study 3). In fact, the size of the bias does not differ from the one apparent in the judgments of less experienced law students.

Our findings add to a large body of evidence demonstrating that sentences given for similar crimes may differ substantially (for reviews, see Ebbesen & Konecni, 1981; Hogarth, 1971). In order to further our understanding of these sentencing disparities, it may be helpful to analyze the sentencing process with respect to the judgmental tasks that are involved in it. Doing so allows us to relate our knowledge about the general principles of judgment and decision making to the realm of sentencing decisions (Arkes, 1989). Because legal judgments often must be made in situations of uncertainty, they are likely to involve the same judgmental strategies that are characteristic of judgments under uncertainty in general.

The present research has demonstrated that judgmental anchoring has a strong influence on criminal sentencing decisions. Conceptualizing the observed disparities as an anchoring effect allowed us to derive novel predictions concerning the role of the perceived relevance of the sentencing demand and the experience of the judges. With this research, we hope to have demonstrated that incorporating the general mechanisms that underlie judgments under uncertainty into the realm of criminal sentencing is a promising strategy that is likely to improve our understanding of the sentencing process and may thus help to optimize it.

Notably, the significance of the present findings extends beyond their implications for legal judgments. In particular, they shed new light on the mechanisms that underlie anchoring effects in real-world settings. As we have pointed out previously, anchoring is a judgmental bias with remarkable practical significance. Not only does it influence legal judgments, it also has clear practical relevance for other decisions in real-world settings. For example, pricing decisions

(Mussweiler et al., 2000; Northcraft & Neale, 1987), estimates of prime interest rates (Russo & Schoemaker, 1989), and outcomes of negotiations (e.g., Chertkoff & Conley, 1967; Galinsky & Mussweiler, in press; Neale & Bazerman, 1991) all may be influenced by the anchoring bias. Although manifestations of anchoring are thus plentiful, convincing theoretical accounts of these effects are not.

One possibility (Jacowitz & Kahneman, 1995; Mussweiler & Strack, 1999a) is that anchoring effects in natural settings are primarily mediated by pragmatic inferences (Grice, 1975). Because demonstrations of anchoring effects in applied settings typically use anchor values that are clearly relevant for the judgment to be made (e.g., the listing price of a piece of real estate), these effects may well be mediated by the information that is contained in the anchor value (see Mussweiler & Strack, 1999a, 1999b, for a more elaborate discussion of this possibility). Specifically, judges may reasonably see the anchor value as informative with respect to the critical judgment and readily use this information. The current data, however, demonstrate that anchor values do not need to be seen as informative in order to exert an effect. This suggests that although pragmatic inferences may well contribute to some anchoring effects in natural settings, they do not constitute a necessary precondition. Thus, a different mechanism may be responsible for the effects of anchoring in natural settings.

Recently, we have suggested that anchoring effects are mediated by a selective increase in the accessibility of anchor-consistent knowledge about the target (for a more detailed account of the selective accessibility model, see Mussweiler & Strack, 1999a, 1999b; for a related notion, see Chapman & Johnson, 1999). Specifically, participants may compare the target quantity (e.g., an appropriate sentence) to the anchor by testing the possibility that this quantity is similar to the anchor value. For example, judges may decide whether a demanded sentence of 34 months is too high or too low by testing the possibility that this sentence is, in fact, appropriate. To do so, they selectively retrieve knowledge that is consistent with this assumption (e.g., "The victim clearly stated that she did not want to have intercourse," and "The defendant used force"; Trope & Liberman, 1996). As a result, the accessibility of anchor-consistent knowledge is increased. In order to make the final sentencing decision, judges then rely primarily on easily accessible knowledge (Higgins, 1996; Wyer & Srull, 1989) so that their judgment is heavily influenced by the anchor-consistent knowledge generated previously. Consequently, the final sentence is assimilated to the one demanded by the prosecutor (for empirical support of these assumptions, see Mussweiler & Strack, 1999b, 2000b; Strack & Mussweiler, 1997; for an overview, see Mussweiler & Strack, 1999a).

Thus, from a selective accessibility perspective, anchoring results because judges rely on easily accessible evidence to make the final judgment. Comparing the target quantity to the anchor value, however, selectively increases the accessibility of anchor-consistent knowledge so that the knowledge base that is used

to make this judgment is distorted. Specifically, judges primarily use anchor-consistent knowledge. As a result, judgments are assimilated to the anchor value.

It is important to note that in contrast to the pragmatic explanation, this account does not require the anchor to be informative. Rather, the very process of comparing the target quantity to the anchor value leads to the described increase in the accessibility of anchor-consistent knowledge. Thus, the fact that the size of the anchoring bias we obtained was independent of the perceived relevance of the sentencing demand seems more consistent with selective accessibility than with the pragmatic account. Although the present research was not explicitly designed to test for the mechanisms that mediate anchoring effects in natural settings, it suggests that selective accessibility is likely to contribute to these effects. Clearly, the supposed generality of the selective-accessibility mechanism—although plausible on theoretical grounds—remains to be tested empirically.

#### References

- Arkes, A. R. (1991). Costs and benefits of judgment errors: Implications for debiasing. *Psychological Bulletin*, *110*, 486-498.
- Austin, W., & Williams, T. (1977). A survey of judges' responses to simulated legal cases: A research note on sentencing disparity. *Journal of Criminal Law and Criminology*, *68*, 306-310.
- Cervone, D., & Peake, P. K. (1986). Anchoring, efficacy, and action: The influence of judgmental heuristics on self-efficacy judgment and behavior. *Journal of Personality and Social Psychology*, *50*, 492-501.
- 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.
- Chapman, G. B., & Johnson, E. J. (1994). The limits of anchoring. *Journal of Behavioral Decision Making*, *7*, 223-242.
- Chapman, G. B., & Johnson, E. J. (1999). Anchoring, activation, and the construction of values. *Organizational Behavior and Human Decision Processes*, *79*, 1-39.
- Chertkoff, J. M., & Conley, M. (1967). Opening offer and frequency of concession as bargaining strategies. *Journal of Personality and Social Psychology*, *7*, 181-185.
- Dickens, C. (1861). *Great expectations*. Boston, MA: Bedford.
- Ebbesen, E. B., & Konecni, V. J. (1981). The process of sentencing adult felons. In B. D. Sales (Ed.), *The trial process* (pp. 413-458). New York, NY: Plenum.
- Galinsky, A. D., & Mussweiler, T. (in press). First offers as anchors: Debiasing by considering the opponent's alternatives. *Journal of Personality and Social Psychology*.



- Gottfredson, D. M., Gottfredson, S. D., & Conly, C. H. (1989). Stakes and risks: Incapacitative intent in sentencing decisions. *Behavioral Sciences and the Law*, *7*, 91-106.
- Grice, H. P. (1975). Logic and conversation. In P. Cole & J. L. Morgan (Eds.), *Syntax and semantics 3: Speech acts* (pp. 41-58). New York, NY: Academic Press.
- Higgins, E. T. (1996). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133-168). New York, NY: Guilford.
- Hogarth, J. (1971). *Sentencing as a human process*. Toronto, Canada: University of Toronto Press.
- Jacowitz, K. E., & Kahneman, D. (1995). Measures of anchoring in estimation tasks. *Personality and Social Psychology Bulletin*, *21*, 1161-1166.
- Joyce, E. J., & Biddle, G. C. (1981). Anchoring and adjustment in probabilistic inferences in auditing. *Journal of Accounting Research*, *19*, 120-145.
- Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge, UK: Cambridge University Press.
- Krahé, B. (1991). Social psychological issues in the study of rape. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 2, pp. 279-309). Chichester, UK: John Wiley & Sons.
- Martin, E. G., & Alonso, C. H. (1997). Influence of the prosecutor's plea on the judge's sentencing in sexual crimes: Hypothesis of the theory of anchoring by Tvesky and Kahneman. In S. Redondo, V. Garrido, J. Perez, & R. Barberel (Eds.), *Advances in psychology and law: International contributions* (pp. 215-226). Berlin, Germany: Walter de Gruyter.
- Mussweiler, T., & Strack, F. (1999a). Comparing is believing: A selective accessibility model of judgmental anchoring. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 10, pp. 135-168). Chichester, UK: John Wiley & Sons.
- Mussweiler, T., & Strack, F. (1999b). Hypothesis-consistent testing and semantic priming in the anchoring paradigm: A selective accessibility model. *Journal of Experimental Social Psychology*, *35*, 136-164.
- Mussweiler, T., & Strack, F. (2000a). Numeric judgments under uncertainty: The role of knowledge in anchoring. *Journal of Experimental Social Psychology*, *79*, 23-38.
- Mussweiler, T., & Strack, F. (2000b). The use of category and exemplar knowledge in the solution of anchoring tasks. *Journal of Personality and Social Psychology*, *78*, 1038-1052.
- Mussweiler, T., Strack, F., & Pfeiffer, T. (2000). Overcoming the inevitable anchoring effect: Considering the opposite compensates for selective accessibility. *Personality and Social Psychology Bulletin*, *26*, 1142-1150.
- Myers, M. A. (1988). Sentencing behavior of judges. *Criminology*, *26*, 649-675.
- Nagel, S. (1962). Judicial backgrounds and criminal cases. *Journal of Criminal Law, Criminology, and Political Science*, *53*, 333-339.
- Neale, M. A., & Bazerman, M. H. (1991). *Cognition and rationality in negotiation*. New York, NY: Free Press.
- Northcraft, G. B., & Neale, M. A. (1987). Experts, amateurs, and real estate: An anchoring-and-adjustment perspective on property pricing decisions. *Organizational Behavior and Human Decision Processes*, *39*, 84-97.
- Russo, J. E., & Schoemaker, P. J. H. (1989). *Decision traps: The ten barriers to brilliant decision-making and how to overcome them*. New York, NY: Simon & Schuster.
- Saks, M. J., & Kidd, R. F. (1980). Human information processing and adjudication: Trial by heuristics. *Law and Society Review*, *15*, 123-160.
- Strack, F., & Mussweiler, T. (1997). Explaining the enigmatic anchoring effect: Mechanisms of selective accessibility. *Journal of Personality and Social Psychology*, *73*, 437-446.
- Switzer, F. S., & Sniezek, J. A. (1991). Judgment processes in motivation: Anchoring and adjustment effects on judgment and behavior. *Organizational Behavior and Human Decision Processes*, *49*, 208-229.
- Trope, Y., & Liberman, A. (1996). Social hypothesis testing: Cognitive and motivational factors. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 239-270). New York, NY: Guilford.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124-1130.
- Whyte, G., & Sebenius, J. K. (1997). The effect of multiple anchors on anchoring in individual and group judgment. *Organizational Behavior and Human Decision Processes*, *69*, 75-85.
- Wilson, T. D., Houston, C., Etling, K. M., & Brekke, N. (1996). A new look at anchoring effects: Basic anchoring and its antecedents. *Journal of Experimental Psychology: General*, *4*, 387-402.
- Wright, W. F., & Anderson, U. (1989). Effects of situation familiarity and financial incentives on use of the anchoring and adjustment heuristics for probability assessment. *Organizational Behavior and Human Decision Processes*, *44*, 68-82.
- Wrightsmann, L. S., Nietzel, M. T., & Fortune, W. H. (1994). *Psychology and the legal system* (3rd ed.). Pacific Grove, CA: Brooks/Cole.
- Wyer, R. S., & Srull, T. K. (1989). *Memory and cognition in its social context*. Hillsdale, NJ: Lawrence Erlbaum.