

### The availability heuristic revisited: experienced ease of retrieval in mundane frequency estimated

Wänke, Michaela; Schwarz, Norbert; Bless, Herbert

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The Availability Heuristic Revisited:  
Experienced Ease of Retrieval in  
Mundane Frequency Estimated

Michaela Wänke, Norbert Schwarz  
Herbert Bless

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Zentrum für Umfragen, Methoden und Analysen e.V.  
Postfach 12 21 55  
6800 Mannheim 1

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**The Availability Heuristic Revisited:  
Experienced Ease of Retrieval in  
Mundane Frequency Estimates**

Michaela Wänke

Universität Mannheim

Norbert Schwarz

Zentrum für Umfragen, Methoden und Analysen,

ZUMA, Mannheim

and

Herbert Bless

Universität Mannheim

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**Abstract**

The availability heuristic proposes that the phenomenal experience of ease of recall serves as a source of information in making frequency or probability judgments. However, ease of recall and amount of recall have typically been confounded in empirical tests. A misattribution approach was used to isolate the impact of the phenomenal experience. As expected, subjects provided the lowest frequency estimates when they believed that an irrelevant context variable facilitated recall, and the highest estimate when they believed that a context variable inhibited recall. Thus, their judgments were mediated by the perceived diagnosticity of the phenomenal experience of ease of recall, as predicted by the availability heuristic.

**The Availability Heuristic Revisited:  
Experienced Ease of Retrieval in  
Mundane Frequency Estimates**

According to Tversky and Kahneman's (1973) availability heuristic, individuals estimate the frequency of an event, or the likelihood of its occurrence, "by the ease with which instances or associations come to mind" (Tversky & Kahneman, 1973, p. 208). Whereas this heuristic has stimulated an enormous amount of research (see Sherman & Corty, 1984; Strack, 1985, for reviews), the classic studies on the issue are surprisingly ambiguous regarding the underlying process, as Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, and Simons (1991) noted. For example, in a well-known study, Tversky and Kahneman (1973, Experiment 3) observed that subjects overestimated the number of words that begin with the letter r, but underestimated the number of words that have r as the third letter. Presumably, this finding reflects that words that begin with a certain letter come to mind more easily than words that have a certain letter in the third position. However, this differential ease of recall may influence subjects' frequency estimates in two different ways. On the one hand, subjects may use the subjective experience of ease or difficulty of recall as a basis of judgment, as suggested by the availability heuristic. If so, they would estimate a higher frequency if the recall task is experienced as easy rather than difficult. On the other hand, they may recall as many words of each type as possible within the time allotted to them and may base their judgment on the recalled sample of words. If it is easier to recall words which begin with a certain letter, these words would be overrepresented in the recalled sample, again resulting in an estimate of higher frequency. Note, however, that in the latter case the estimate would be based on recalled content rather than on the subjective experience of ease of recall.

In a related study, Gabrielcik and Fazio (1984) observed that exposing subjects to subliminally presented words containing the letter t increased subjects' estimates of the frequency of t-words. Again, this finding may either reflect that subjects could generate more words including a t if primed, or that they relied on the ease with which relevant exemplars could be called to mind. Similar ambiguities apply to other studies (see Sherman & Corty, 1984; Strack, 1985; Taylor, 1982, for reviews). Typically, the manipulations that have been introduced to increase the subjectively experienced ease of recall have also been likely to affect the amount of subjects' recall. As a result, it is difficult to determine whether the obtained estimates of frequency, likelihood, or typicality are based on subjects' phenomenal experiences or on a biased sample of recalled information. As Taylor (1982, p. 199) noted, the latter possibility would render the availability heuristic rather trivial -- after all, "one's judgments are always based on what comes to mind" (emphasis added).

In a recent set of studies, Schwarz et al. (1991) attempted to disentangle the relative contribution of experienced ease of recall and recalled content by introducing conditions under which ease of recall and recalled content would lead to opposite inferences. Specifically, they asked their subjects to report either six or twelve examples of either assertive or unassertive behaviors and subsequently assessed self-ratings of assertiveness. If subjects' self-ratings are based on recall content, they should report higher assertiveness after reporting twelve rather than six examples of assertive behaviors, and lower assertiveness after recalling twelve rather than six examples of unassertive behaviors. However, pretest data had indicated that recalling six examples was experienced as being easier than recalling twelve examples. If subjects based their judgment on experienced ease of recall, they should therefore report higher assertiveness after recalling six rather than

twelve examples of assertive behaviors, and higher assertiveness after recalling twelve rather than six examples of unassertive behavior. In essence, they should conclude from the experienced difficulty of recalling twelve assertiveness (or unassertiveness, respectively) instances that they can't be that assertive (or unassertive) after all. Empirically, this latter set of predictions was supported (Schwarz et al., 1991, Experiment 1), indicating that subjects based their self-ratings on the subjective experience of ease or difficulty of recall rather than on recalled content per se. Moreover, the impact of experienced ease of recall was eliminated when a misattribution manipulation undermined its perceived informational value (Schwarz et al., 1991, Experiment 3). Specifically, if subjects could misattribute the experienced ease or difficulty of recall to the alleged impact of meditation music played to them, they relied on the content of recall rather than on their phenomenal experience, resulting in a reversal of the previously obtained pattern in self-ratings of assertiveness. In combination, these findings demonstrated that the subjective experience of ease or difficulty in recalling behaviors may serve as a source of information on self-related judgments in its own right, as suggested by the availability heuristic.

Note, however, that the Schwarz et al. (1991) studies tested the use of the subjective experience of ease of recall in the domain of self-related judgment. The processes involved in self-related judgment, however, may differ to some degree from the processes involved in other domains of social judgment, let alone non-social judgments (e. g., Rholes, Newman, & Ruble, 1990; Strack, 1992). In recalling self-related instances the accompanying subjective experiences may receive particular attention. Moreover, the subjective experiences that accompany the thought process may seem more diagnostic for self-related, seemingly "subjective" judgments, than for non-social, seemingly "objective", judgments. If so, the



self-related nature of the judgment task may have rendered the experienced ease or difficulty of recall particularly relevant in the Schwarz et al. (1991) studies. The operation of the availability heuristic, however, is theoretically not limited to self-related judgments. Indeed, most of the classic demonstrations pertain to the frequency estimation of events that are not related to self, as in the above example of estimating letter-frequencies. At present, it is unclear if subjects would rely on their subjective experience in making frequency judgments in a domain that is not self-related. To explore this issue, we conducted an extended replication of Tversky and Kahneman's (1973) letter-frequency study, introducing conditions designed to disentangle the confound of ease and amount of recall.

To reiterate, the ambiguity of the original study derives from the fact that subjects do not only experience recalling words that begin with a specified letter as easier to recall than words that have this letter in the third position, but are also likely to recall more words of the former than of the latter type. To disentangle this confound, it is imperative to hold the amount of recalled words constant, while varying the perceived diagnosticity of experienced ease of recall. To do this, we asked all subjects to write down ten words that have the letter "t" in the third position, and ten words that begin with the letter "t", but manipulated the perceived diagnosticity of experienced ease of recall with a misattribution manipulation. Whereas all subjects recorded words with the letter "t" in the third position on a blank sheet of paper, the conditions for recording first letter words differed. Subjects in two experimental conditions were provided a sheet of paper imprinted with pale but visible rows of the letter "t" for recording first letter words. One group was told that seeing rows of t's facilitated the recall of t-words, whereas the other group was told that it inhibited the recall of t-words. A control group received a blank sheet of paper and did not expect any side-

effects of their work sheet.

If subjects attribute the relative ease of recalling words that begin with a t to the alleged impact of their work sheet, they should conclude that their phenomenal experience of ease of recall is not diagnostic. Accordingly, they should discount this experience and should provide lower estimates of the frequency of words that begin with a t than subjects who expect no side-effects of their work sheet. Conversely, experiencing the recall task as easy despite the alleged inhibiting effect of the work sheet should render the phenomenal experience particularly diagnostic, thus increasing frequency estimates relative to the control condition. In combination, the emergence of these discounting and augmentation effects (Kelley, 1972) would indicate that the subjective experience of ease of recall is indeed used in making judgments that are not self-related.

## **Method**

### **Subjects**

Thirty students at the University of Mannheim, Germany, participated in the study and were randomly assigned to conditions. The data of 2 subjects, who were not native speakers of German, were eliminated from the data set, leaving 28 subjects in the analyses. Subjects received chocolate bars as an expression of appreciation.

### **Procedure**

Subjects were told that the study concerned the influence of several variables on language production and that there would be a number of different tasks. To support the cover story, they were first asked to provide information on several factors supposedly related to

verbal abilities, such as school grades in different subjects, musicality, handedness, and word meanings.

As the first experimental task, all subjects wrote down ten words that have the letter "t" in the third position. They were given a blank sheet of paper to do so. Subsequently, they rated the difficulty of this task along an 8-point-scale ranging from very easy (1) to very difficult (8). Next, all subjects had to write down ten words beginning with the letter "t". Subjects assigned to the control condition again received a blank sheet of paper for this task, whereas subjects assigned to the experimental conditions received a sheet of paper that was imprinted with pale but visible rows of the letter "t"<sup>1</sup>. In the facilitation condition, these subjects were told that seeing the letter "t" on their work sheet would facilitate the recall of t-words. In contrast, subjects assigned to the inhibition condition were told that seeing the letter "t" on their work sheet would inhibit the recall of t-words. Following completion of the task, subjects again rated the experienced difficulty along an 8 point scale.

Finally, ratings of the frequency of first letter words compared to third letter words were obtained. Subjects made these ratings along an 8-point scale, with 1 indicating "many more third letter words than first letter words", and 8 indicating "many more first letter words than third letter words". Following completion of this task, subjects were debriefed and probed for suspicion. None of the subjects commented on the manipulation or guessed the real purpose of the study.

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<sup>1</sup>. Ideally, one might wish that subjects assigned to the control condition were exposed to the same imprinted work sheet, but without information about its alleged side-effects. However, pretesting indicated that subjects might spontaneously generate hypotheses about the possible impact of seeing the letter t. Given that the experimental manipulations call for a differential impact of the imprinted work sheets as a function of the side-effects information, the difference in the work sheets used does not provide an alternative account for the expected findings.

## Results

### Experienced Ease

Analyses of subjects' ratings of the experienced ease of retrieving third-letter-words and first-letter-words, treating experimental conditions as a between, and task (first letter words vs. third letter words) as a within subjects factor, indicated that finding 10 third letter words was perceived as being more difficult ( $M = 3.1$ ) than finding 10 first letter words ( $M = 1.7$ ),  $F(1,25) = 29.53$ ,  $p < .001$ . The ease of recall ratings were not affected by the misattribution manipulation, all  $p$ 's  $> .15$ . Hence, any effects of the misattribution manipulation on subjects' frequency estimates cannot be attributed to differences in experienced ease of recall per se, but only to differences in the diagnosticity of this experience, as theoretically desired.

### Frequency Estimates

A one-factorial ANOVA treating the facilitation, inhibition and control condition as a between subjects factor revealed that subjects' frequency ratings of words that begin with a "t" relative to words that have "t" as the third letter showed a significant impact of the misattribution manipulations,  $F(2,25) = 4.43$ ,  $p < .025$ . As expected, subjects who thought that finding 10 words beginning with the letter "t" was facilitated by the nature of their work sheet provided the lowest estimate of the relative frequency of first-letter words ( $M = 3.8$ ). In contrast, subjects who believed that their performance was inhibited by the nature of their work sheet provided the highest estimate of the relative frequency of first-letter words ( $M = 6.1$ ), whereas the estimates provided by control group subjects fell in between ( $M = 5.4$ ).

Contrast analyses revealed that the estimates provided under alleged facilitation conditions were lower than the estimates provided under either alleged inhibition,  $t(25) = 2.9$ ,  $p < .008$ , or control conditions,  $t(25) = 2.07$ ,  $p < .05$ . However, the estimates reported under inhibition conditions were not significantly higher than under control conditions,  $t(25) = -.907$ , ns.

### Discussion

In summary, the present findings demonstrate that the phenomenal experience of ease or difficulty of recall may serve as a source of information in its own right, as suggested by Tversky and Kahneman's (1973) availability heuristic. Whereas previous studies were inconclusive due to a natural confound of ease of recall and amount of recall in the usual free recall task, this confound could be disentangled by the use of misattribution manipulations. Specifically, subjects who misattributed the higher ease of recalling ten first letter words as compared to ten third letter words to the impact of their work sheet, estimated first letter words to be less frequent than subjects who did not expect side-effects of their work sheet. This discounting effect indicates that the misattribution manipulation undermined subjects' reliance on the informational value of their phenomenal experience of ease of recall, as has previously been observed by Schwarz et al. (1991, Experiment 3) for self-related judgments. Similarly, subjects who expected their work sheet to inhibit the recall of relevant words provided the highest frequency estimate for the words, although this augmentation effect did not reach significance. Given that retrieving words beginning with a "t" is indeed an easy task, subjects may have found the alleged facilitation effect more plausible than the alleged inhibition effect, thus rendering the two misattribution

manipulations differentially successful. In combination, the observed pattern of results indicates that the use of the phenomenal experience of ease of recall as a basis of judgment is not restricted to self-related judgments, thus extending previous research by Schwarz et al. (1991).

At a more general level, these findings demonstrate that the potentially biasing impact of ease of recall on judgments of frequency, probability, or typicality reflects a process of misattribution, as Clore and Parrott (1991; see also Clore, 1992) noted. In principle, the use of the availability heuristic is based on the correct insight that it is easier to recall frequent rather than rare words or events. What renders this heuristic error prone is that the experienced ease of retrieval may reflect the impact of variables other than frequency, such as word structure in the present study, or the event's salience or vividness (see Nisbett & Ross, 1980). As has been shown for other phenomenal experiences, such as moods (e. g., Schwarz & Clore, 1983) or arousal states (e.g., Zanna & Cooper, 1976; Zillman, 1978), individuals will only rely on their phenomenal experience of ease of recall as a basis of judgment if they can attribute it, rightly or not, to the impact of the object of judgment. Accordingly, biasing effects of ease of recall, as of any other phenomenal experience (see Schwarz, 1990), are restricted to conditions under which its informational value is not called into question.

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