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Do Voters Use Episodic Knowledge to Rely on Recognition?

Julian N. Marewski (marewski@mpib-berlin.mpg.de)
Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition
Lentzeallee 94, 14195 Berlin, Germany

Wolfgang Gaissmaier (gaissmaier@mpib-berlin.mpg.de)
Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition
Lentzeallee 94, 14195 Berlin, Germany

Lael J. Schooler (schooler@mpib-berlin.mpg.de)
Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition
Lentzeallee 94, 14195 Berlin, Germany

Daniel G. Goldstein (dgoldstein@london.edu)
London Business School
Regent's Park, Sussex Place, London, NW1 4SA, United Kingdom

Gerd Gigerenzer (gigerenzer@mpib-berlin.mpg.de)
Max Planck Institute for Human Development, Center for Adaptive Behavior and Cognition
Lentzeallee 94, 14195 Berlin, Germany

Abstract

The recognition heuristic is a simple mnemonic decision strategy. In a comparison between two alternatives, one recognized and the other not, it bets that the recognized alternative is likely to score a higher value on a given criterion of interest. Yet, this heuristic is not applicable when both alternatives are recognized. We investigate a recognition-based heuristic for tasks with two recognized alternatives. What we call the source heuristic relies on episodic knowledge about the recognition sources to treat recognized alternatives as unrecognized. An experiment provides evidence to suggest that voters rely on this source heuristic when inferring the outcomes of real-world German political elections.

Keywords: Simple heuristics; recognition heuristic; fluency heuristic; episodic memory; political elections

Inferences with Recognition

A couple of months before this paper was written, eight Democratic and nine Republican candidates in the U.S. primaries had invested thousands of dollars to enter their names into Americans' recognition memory. It is likely that higher name recognition considerably increased their chances of being included in voters' consideration sets of candidates potentially worth a vote. At the same time, not only in the United States but all over the globe, people were wondering who would emerge from the primaries as a winner, possibly becoming the next President.

A simple cognitive strategy that can be relied on to forecast which candidates voters are most likely to favor in an election is known as the *recognition heuristic* (Goldstein & Gigerenzer, 2002). It helps people infer which of two alternatives, one recognized and the other not, has the larger value on a given criterion.[1] The heuristic reads as follows:

> If only one of two alternatives is recognized, infer the recognized one to have a larger value on the criterion.

The recognition heuristic bets on certain structural relations in a decision maker's environment. Figure 1 illustrates what we call the *ecological rationality* of the recognition heuristic in terms of three correlations. There is a *criterion*, an *environmental mediator*, and a person who infers the criterion. Using the recognition heuristic can help a person to make accurate inferences when there is both a substantial *ecological correlation* between the mediator and the criterion and a substantial *surrogate correlation* between the mediator and recognition. This combination can yield a substantial *recognition correlation*; that is, recognized alternatives tend to have higher criterion values than unrecognized ones. If either or both the ecological and surrogate correlations are zero, the use of the recognition heuristic will not result in accurate inferences; that is, applying this heuristic is not ecologically rational.

[1] In the memory literature, the term *recognition* is often used to refer to a person's ability to distinguish between stimuli presented in an experiment (e.g., as in a study list) and those that were not. Usually, a person has heard of both examples of the stimuli before participating in the experiment (e.g., stimuli could be the names CLINTON and NIXON). In this article we adopt Goldstein and Gigerenzer's (2002; see also Pleskac, 2007; Schooler & Hertwig, 2005) usage of the term to refer to a person's ability to discriminate between novel stimuli that have not been heard of before (e.g., the name SCHNAU) and those that have (e.g., NIXON).

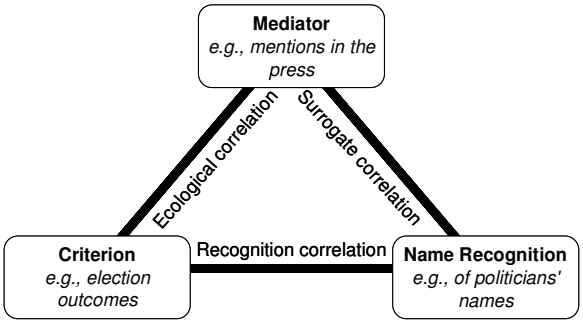

Figure 1. An unknown criterion is reflected by a mediator. The mediator makes it more likely for a person to encounter alternatives with larger criterion values than those with smaller ones (e.g., the press mentions more successful politicians more frequently). As a result, the person will be more likely to recognize alternatives with larger criterion values than those with smaller ones, and, ultimately, recognition judgments can be relied upon to infer the criterion (e.g., the success of politicians in elections). Marewski (2008) found that the recognition heuristic yields accurate inferences about the outcomes of elections.

What Do People Do When Two Alternatives Are Recognized?

The recognition heuristic is a model for the situation in which one of two alternatives is recognized. Yet, as we sample alternatives in our world, recognition memory grows. Sometimes, people end up recognizing all alternatives of one kind, say, all parties in an election. In this case, recognition alone does not differentiate between alternatives, and in principle, the recognition heuristic as formulated by Goldstein and Gigerenzer (2002) cannot be used.

However, the recognition memory literature suggests that episodic memory could support the use of recognition information even then. Specifically, here we hypothesize that people treat recognized alternatives as *unrecognized* when they believe the recognition source does not represent an environmental mediator that reflects alternatives' criterion values (Figure 1)—a situation in which one has good reason to judge the predictive power of recognition to be low. To illustrate, guess about whom more biographies have been written, Mr. Kissinger or Mr. Marewski. Many of you recognize the name of the graduate student who is the first author of this article only from its first page. Although both names are recognized, episodic knowledge tells us that in one case, the source is an article that is not linked to the criterion, whereas in the other case, the source is the media, which may well reflect the criterion. Although recognition alone does not differentiate between the two, you could treat Mr. Marewski as unrecognized and then pick Mr. Kissinger. Thus, in situations in which two alternatives in a pair are recognized, a simple *source heuristic* might be relied upon:

> If two alternatives are recognized, but the source of one is unrelated to the criterion, then treat this alternative as unrecognized and infer that the other has the higher value on the criterion.

Recognition in Political Elections: A Study

Do people follow this principle? And if so, when do they follow it and when do they not? To answer these questions, we ran a study during the 2005 German national election, when 61,870,711 eligible voters could choose between 25 parties. In a first session prior to this election, we let a group of eligible voters acquire recognition of parties by repeatedly exposing them to the party names in an experiment. In a second session, we could then test (a) if they treated recognized parties as unrecognized when they identified their study participation as the recognition source, a source they should have little reason to expect to reflect electoral success. We could also test (b) if they trusted recognition when they acquired it before the experiment in their natural environment, where recognition sources such as the press do reflect electoral success (Figure 2).

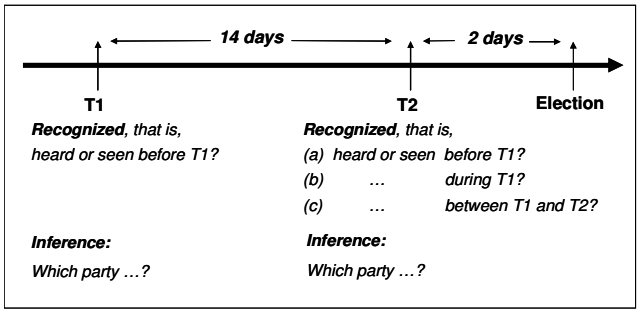

Figure 2. Schematic presentation of the study design.

Method

Sixty-six residents of Berlin, Germany (52% female; mean age 26 years, *SD* = 3.7) completed a computerized experiment in the laboratories of the Max Plank Institute for Human Development. These eligible voters (henceforth: *voters*) were at least 18 years old. (Voting age is 18 in Germany.) They were paid €25 ($37).[2]

The first session (*T1*) took place about 16 days before the election and the second session (*T2*) 2 days before the election. In a recognition task in both sessions, we presented voters the name of one party at a time on a computer screen and asked them to judge whether they recognized the party, that is, whether they had seen or heard of the party prior to participating in the study. Participants were instructed to respond as quickly and accurately as possible. In the second session, in a recognition source task, we again presented one party name at a time and additionally asked the voters whether they had seen or heard a party name (a) before the first session, (b) during the first session, or (c) after the first session and before the second session. In both sessions, in a two-alternative forced-choice task, we presented two party

[2] One participant did not return to the second session. Her data were excluded.

names on the computer screen (one on the left side and the other on the right) and asked voters to infer which party would win more votes in the election. There were a total of 300 comparisons of parties (complete pairings of 25 parties). In all tasks, the order of appearance of party names was randomized and all trials were preceded by fixation crosses for 1,000 ms. All responses were made on a standard PC keyboard. Positive responses were made with the index finger of the right hand. In each session, completing the experiment took about 50 min.

To assess how well a heuristic predicts each voter's forecasts in the two-alternative task, for each voter we selected the paired comparisons where the heuristic could be applied. Across these comparisons, we counted how often the voter had made an inference consistent with the heuristic (A), and the number of times this did not happen (D). A heuristic's *accordance rate*, k, is the proportion of inferences consistent with it:

$$k = A/(A + D). \quad (1)$$

The *accuracy* of a voter's election forecast is the proportion of correct election forecasts made. It is computed separately for T1 and T2 across the comparisons of two parties the voter worked on in the two-alternative task.

Results and Discussion

Do voters rely on episodic knowledge to treat parties as unrecognized? At T1, voters could apply the recognition heuristic on average on 144 pairs (SE = 2.6) consisting of one recognized and one unrecognized party. Since they had seen all parties in the study at T1, by T2 they could not apply the recognition heuristic but could use the source heuristic instead—if they treated the parties they did not recognize at T1 as also unrecognized at T2. In this case, they could continue to forecast more votes for the parties they already recognized at T1; that is, it should be possible to predict their forecasts at T2 *based on their recognition of a party name at T1*.

To test this, we computed voters' recognition heuristic accordance rates at T1 and predicted their source heuristic accordance rates at T2 based on recognition data from T1. That is, we used voters' recognition data from T1 to calculate their recognition heuristic accordance rate at T1. We also used their recognition data from T1 to compute their source heuristic accordance rate at T2. If at T2 voters continued to forecast more votes for the parties they already recognized at T1, both accordance rates should be similar.

In fact, we observed only small declines in the recognition heuristic accordance rate at T1 (M = .89) to the source heuristic accordance rate at T2 (M = .87; both SE = .01), and consistent with this result, only small drops in the accuracy of voters' election forecasts, (M_{T1} = .84, M_{T2} = .82, both SE = .01), which should also be very similar if voters continued to forecast more votes for the previously recognized party.

Yet, in forecast for the larger parties, voters may have had an alternative to relying on episodic knowledge about recognition sources at T2: They could also have used factual (i.e., semantic) knowledge about parties as *cues*, say, opinion poll data. To gain control over this possibility, we excluded the six largest German parties and, in addition, two well-known extreme right-wing parties from our analyses. These eight parties receive news coverage even when no election is taking place and/or are regularly represented in German parliaments. Furthermore, opinion polls tend to be published only for these eight parties and not for those that are lesser known.[3] If voters relied on cues for these eight parties instead of on the source heuristic, they could base their forecasts for the smaller parties on random guesses. In this case, at T2 the source heuristic accordance rate and accuracy of their forecast should drop to the chance level of .50 when the eight parties are excluded. However, the source heuristic accordance rate did not decrease to .50. In comparison to the recognition heuristic accordance rate of M = .78 at T1, the source heuristic accordance rate only dropped to M = .75 (both SE = .02) at T2; and the accuracy dropped from M = .64 (SE = .01) at T1 to M = .61 (SE = .02) at T2, suggesting that voters relied on episodic knowledge to treat some parties as unrecognized in order to use the source heuristic.

Model comparison Instead of using the source heuristic, voters could also rely on a *fluency heuristic*. This heuristic has been defined in different ways (e.g., Jacoby & Brooks, 1984). Here we use the term to refer to Schooler and Hertwig's (2005) model, which builds on these earlier definitions and on a long research tradition on fluency (e.g., Jacoby & Dallas, 1981) as well as related notions such as familiarity (e.g., Hintzman, 1988; Mandler, 1980). Schooler and Hertwig implemented their fluency heuristic side by side with the recognition heuristic in the ACT-R (*adaptive control of thought–rational*) cognitive architecture (e.g., Anderson et al., 2004). In ACT-R, the same memory currency—a continuous *activation* trace—determines (a) whether an alternative will be retrieved or not and (b) the time it takes to retrieve it. Schooler and Hertwig adopted Anderson, Bothell, Lebiere, and Matessa's (1998) assumption that retrieving an alternative implies recognizing it, adding the assumption that the more quickly the alternative is retrieved, the greater the sense of recognition. A person using the recognition heuristic can base inferences on the binary outcome of this memory process (retrieved or not). A person using the fluency heuristic, in turn, can base inferences on the more graded outcome of the same process, namely, on the speed with which the alternatives come to mind, that is, on their retrieval time or *retrieval fluency*. By this token, the fluency heuristic is a computational instantiation of the version of Tversky and Kahneman's (1973) *availability heuristic* that bases judgments on ease of retrieval (for a discussion of the differences between the two

[3] In fact, in another study in German elections, Marewski (2008) found these eight parties to represent those about which, on average, 95.5% (Mdn = 98.3%) of the participants indicated they had knowledge. Only 13.4% of the participants, on average, had knowledge about the remaining smaller parties (Mdn = 11.7%).

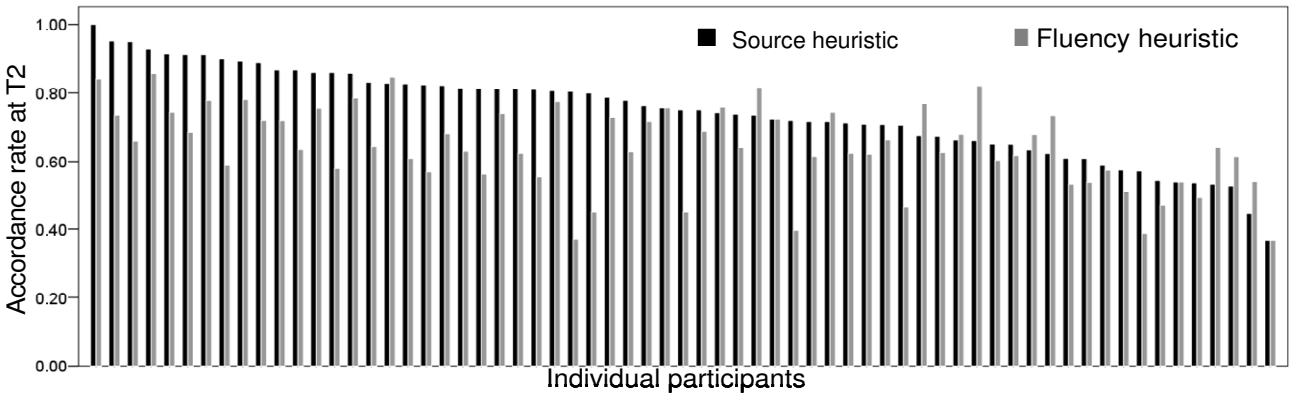

Figure 3. Source heuristic versus fluency heuristic. Pairs of bars show individual participants' accordance rates for the two models at T2 (N = 65).

heuristics and the recognition heuristic, see Schooler & Hertwig; Hertwig, Herzog, Schooler, & Reimer, 2008; see Jacoby & Dallas, 1981, p. 333; Jacoby, Kelley, Brown, & Jasechko, 1989, p. 328, for an articulation of the link between their fluency/familiarity concept and availability.) The fluency heuristic is defined as follows:

> If two alternatives are recognized and one is more quickly retrieved than the other, infer that this alternative has the higher value with respect to the criterion.

Operationalizing retrieval time as recognition time, we used each voter's reaction times in the recognition task at *T2* to compute the proportion of judgments consistent with the fluency heuristic at *T2* (see Equation 1). This procedure has been successfully applied to model people's inferences with the fluency heuristic (Hertwig et al., 2008). As above, we used the recognition data from *T1* to compute the source heuristic accordance rate on the same pairs at *T2*. To gain control over voters' access to cues, we excluded the eight larger parties.

The fluency heuristic cannot be used when differences in retrieval time between two alternatives are very small and therefore not detectable. Guided by Fraisse's (1984) review of the timing literature, Schooler and Hertwig (2005) assumed that people are able to detect differences in time that exceed 100 ms. Hertwig et al. (2008) provided empirical support for this assumption. Thus, we restricted the comparison between the two heuristics to parties that differed by more than 100 ms in recognition time at T2. On the resulting pairs, each heuristic unambiguously decides for one of the parties. Which heuristic predicts voters' decisions best?

For 49 voters, the source heuristic accounts for more election forecasts than the fluency heuristic. For 12 voters, the fluency heuristic predicts judgments best, and for 4 others, the two heuristics' accordance rates are identical (Figure 3). This suggests that a majority of voters relied on episodic knowledge to treat recognized parties as unrecognized and applied the source heuristic. This finding is consistent with experimental results and computer simulations with ACT-R's memory model, suggesting that people are most likely to rely on the fluency heuristic when they cannot use knowledge instead (Marewski & Schooler, 2008). It is also consistent with studies indicating that people are less likely to rely on a sense of fluency when this sense has been manipulated experimentally (e.g., Jacoby, et al., 1989).[4] Note, however, that not all voters were better modeled by the source heuristic than by the fluency heuristic. We therefore next examine how people decide when to rely on the source heuristic.

Do voters use episodic knowledge to decide when to rely on recognition? The source heuristic is only applicable when the recognition source of one alternative correlates with the criterion but the other does not. At T2, voters sometimes erred when identifying recognition sources. Such source confusions constitute an interesting case. They allow for comparing voters' trust in recognition in two situations: when they (a) *correctly* identified the study as the source, and (b) when they *falsely* believed their recognition was naturally acquired when in fact it was also only experimentally induced. Mentions of party names in studies are unlikely to reflect election outcomes; however, in the natural environment, recognition sources such as newspapers can reflect electoral success (Marewski, 2008). Correspondingly, voters may have judged the predictive power of recognition to be lower when they correctly tracked the study as the source than when they falsely believed that recognition was acquired in the natural environment. Therefore, voters should be more likely to treat parties as unrecognized when they have identified the study rather than the natural environment as the source.

[4] We use the fluency heuristic as formulated above as a *benchmark* for the source heuristic. That is, to examine *how well* the source heuristic predicts behavior, we compare it to a model that does not take source knowledge into account. However, this is not to say that source evaluation processes could not play a role in people's reliance on retrieval fluency.

To test this, we selected for each voter all pairs that consisted of a *r*ecognized and an *u*nrecognized party at T1 (*RU pairs*) and that had become pairs of two *r*ecognized parties at T2 (*RR pairs*). We divided these pairs into two kinds. First, on *correct-source RR pairs*, at T2 voters correctly indicated that they only recognized the second, formerly unrecognized party from the study (at T1, this party was unrecognized; at T2, it was believed to be unrecognized before T1, recognized at T1, and unrecognized between T1 and T2; Figure 2). We expected that at T2 voters would continue to treat this second, formerly unrecognized party as unrecognized. In doing so, they would be able to use the source heuristic, and in this case, at T1 *and* at T2, they should forecast more votes for the party they already recognized at T1 than for the second party. As a result, the recognition heuristic accordance rate at T1 and the source heuristic accordance rate at T2 (both based on recognition data from T1) should differ little.

Second, *false-source RR pairs* were identical to correct-source *RR* pairs except that at T2 voters falsely believed they had recognized the second party *before* T1. On false-source *RR* pairs, voters should thus not treat the second party as unrecognized and, since the first party is also recognized from the natural environment, they should not be able to use the source heuristic. Instead they would have to resort to other heuristics, or guess. Therefore, the source heuristic accordance rate at T2 should decrease in comparison to the recognition heuristic accordance rate at T1 (both rates based on recognition data from T1).

For 27 voters we identified at least one false-source *RR* pair (M = 22 pairs) *and* one correct-source *RR* pair (M = 81). To gain control over voters' access to cues, we excluded the eight larger parties. As predicted, on false-source *RR* pairs, voters' source heuristic accordance rate at T2 was lower than the recognition heuristic accordance rate at T1, whereas there was little difference on correct-source *RR* pairs—a pattern we also found in the accuracy of voters' election forecasts (Tables 2, 3).[5]

Discussion

This study provides evidence for voters' use of episodic knowledge to assess the predictive power of recognition and rely on the source heuristic in pairs of two recognized alternatives: Episodic knowledge appears to have helped voters to identify recognition sources. One source (the lab) was unlikely to represent a mediator reflecting the criterion, whereas another (the natural environment) was likely to reflect it. Thus, when recognition was acquired in the natural environment, voters were more likely to trust it than when it was acquired in the lab.

[5] When judging the magnitude of these effects, one has to keep in mind that the strategies people may have resorted to on false-source *RR* pairs may have mimicked some of the choices of the source heuristic, meaning that one would not necessarily expect the source heuristic accordance rate to reach the chance level of .50 on false-source *RR* pairs at T2.

A long research tradition in cognitive psychology has stressed the importance of source evaluation processes for behavior (for an overview see, e.g., Johnson, Hashtroudi, & Lindsay, 1993). The current findings help to explain earlier work: In a study by Oppenheimer (2003) people were unlikely to rely on recognition to infer the size of cities when they knew that they recognized cities for reasons dissociated with the criterion (see also Oppenheimer, 2004). Our data are also consistent with Jacoby et al.'s (1989) well-known "overnight fame" experiments in which people seemed to rely on experimentally induced recognition to infer other people's fame when they were unable to recall the source of recognition. At the same time, they tended to ignore recognition when they could trace it exclusively to the experiment—a mediator that is unlikely to reflect the criterion fame.

Table 1: Mean (SE) accordance rates at T1 and T2 as well as accuracy of voters' election forecasts on correct-source RR pairs and false-source RR pairs computed across pairs of smaller parties

	T1 correct	T2 correct	T1 false	T2 false
Accordance	.80 (.03)	.83 (.03)	.71 (.04)	.64 (.05)
Accuracy	.66 (.03)	.62 (.03)	.65 (.03)	.57 (.03)

Note. n = 27. Correct: correct-source *RR* pairs. False: false-source *RR* pairs. *RR*: two recognized parties. (paired data; confidence intervals in Table 2)

Table 2: Confidence intervals (CI) on mean differences in accordance rates between T1 and T2, as well as on the mean differences in the accuracy of voters' election forecasts, computed for correct-source RR pairs and false-source RR pairs consisting of smaller parties

	Mean difference	95% CI on the mean difference (Lower, upper)
Accordance	T2 correct–T1 correct	(−.03, .08)
	T2 false–T1 false	(−.16, .009)
Accuracy	T2 correct–T1 correct	(−.08, −.002)
	T2 false–T1 false	(−.13, −.02)

Note. n = 27. Correct: correct-source *RR* pairs. False: false-source *RR* pairs. *RR*: two recognized parties. Table depicts paired data.

Similarly, Goldstein and Gigerenzer (2002) induced false recognition of city names and observed how after the passing of several weeks, people would more often infer cities with induced recognition to be larger than novel, unrecognized ones. It is likely that as time passed, people were unable to pinpoint the experiment as the recognition source, and so they relied on induced recognition even though it was not predictive of the criterion.

In this study, Goldstein and Gigerenzer (2002) also showed that the accuracy of people's inferences decreases

when they are unable to use the recognition heuristic because all alternatives from a set end up being recognized. They hypothesized that in such situations, people have to rely on cues or fluency or guess instead, which can be less accurate than relying on recognition. Recently, much empirical research has investigated whether and when such *less-is-more effects* occur (e.g., Dougherty, Franco-Watkins, & Thomas, 2008; Gigerenzer; Hoffrage, & Goldstein, 2008; Pachur & Biele, 2007; Pohl, 2006; Snook & Cullen, 2006). Our findings have important implications for this work: When a person can correctly recall recognition sources and treat some recognized alternatives as unrecognized, less-is-more effects may be diminished.

Conclusion

Voters' rules of thumb for deciding for whom to vote are often assumed to operate on voters' partiality to candidates, their attitudes about political issues, or their perceptions of political parties' and candidates' competence. At the same time, empirical evidence suggests that voters take into account not only the desirability of candidates or parties but also their likelihood of being elected (Stone & Abramowitz, 1983), and, as our findings indicate, voters may rely on episodic knowledge and recognition to infer which political parties have the best chances of being elected.

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