Table 2
Ten well-studied heuristics for which there is evidence that they are in the adaptive toolbox of humans. Each heuristic can be used to solve problems in social and nonsocial environments. See the references given for more information regarding their ecological rationality, and the surprising predictions they entail

Heuristic	Definition	Ecologically Rational If	Surprising Findings (examples)
Recognition heuristic (Goldstein & Gigerenzer, 2002)	If one of two alternatives is recognized, infer that it has the higher value on the criterion.	Recognition validity >.5	Less-is-more effect if $\alpha > \beta$; systematic forgetting can be beneficial (Schooler & Hertwig, 2005).
Fluency heuristic (Jacoby & Dallas, 1981)	If both alternatives are recognized but one is recognized faster, infer that it has the higher value on the criterion.	Fluency validity >.5	Less-is-more effect; systematic forgetting can be beneficial (Schooler & Hertwig, 2005).
Take-the-best (Gigerenzer & Goldstein, 1996)	To infer which of two alternatives has the higher value: (a) search through cues in order of validity, (b) stop search as soon as a cue discriminates, and (c) choose the alternative this cue favors.	See Table 1 and main text	Often predicts more accurately than multiple regression (Czerlinski et al., 1999), neural networks, exemplar models, and decision tree algorithms (Brighton, 2006).
Tallying (unit-weight linear model, Dawes, 1979)	To estimate a criterion, do not estimate weights but simply count the number of positive cues.	Cue validities vary little, low redundancy (Hogarth & Karelaia, 2005, 2006)	Often predict equally or more accurately than multiple regression (Czerlinski et al., 1999).
Satisficing (Simon, 1955; Todd & Miller, 1999)	Search through alternatives and choose the first one that exceeds your aspiration level.	Number of alternatives decreases rapidly over time, such as in seasonal mating pools (Dudey & Todd, 2002).	Aspiration levels can lead to significantly better choices than chance, even if they are arbitrary (e.g., the secretary problem, see Gilbert & Mosteller, 1966; the envelope problem, see Bruss, 2000).
$1/N$; equality heuristic (DeMiguel et al., in press)	Allocate resources equally to each of N alternatives.	High unpredictability, small learning sample, large N.	Can outperform optimal asset allocation portfolios.
Default heuristic (Johnson & Goldstein, 2003; Pichert & Katsikopoulos, 2008)	If there is a default, do nothing.	Values of those who set defaults match those of the decision maker; when the consequences of a choice are hard to foresee.	Explains why mass mailing has little effect on organ donor registration; predicts behavior when trait and preference theories fail.

Table 2
(Continued)

Heuristic	Definition	Ecologically Rational If	Surprising Findings (examples)
Tit-for-tat (Axelrod, 1984)	Cooperate first and then imitate your partner's last behavior	The other players also play tit-for-tat; the rules of the game allow for defection or cooperation but not divorce	Can lead to a higher payoff than optimization (backward induction).
Imitate the majority (Boyd & Richerson, 2005)	Consider the majority of people in your peer group and imitate their behavior	Environment is stable or only changes slowly; info search is costly or time-consuming	A driving force in bonding, group identification, and moral behavior.
Imitate the successful (Boyd & Richerson, 2005)	Consider the most successful person and imitate his or her behavior	Individual learning is slow; information search is costly or time-consuming	A driving force in cultural evolution.

Note: For formal definitions, see references.

> If you have heard of both players, but the name of one came faster to your mind than the other, predict that this player will win the game.

Finally, assume that the visitor is more knowledgeable and can recall various facts about both players. That again eliminates the recognition heuristic and leaves a choice between the fluency heuristic and take-the-best. According to the experimental evidence, the majority of subjects switch to knowledge-based heuristics such as take-the-best when the values of both alternatives on relevant cues can be recalled (Marewski, Gaissmaier, Schooler, Goldstein, & Gigerenzer, unpublished data), consistent with an analysis of the relative ecological rationality of the two heuristics in this situation. The general point is that memory ''selects'' heuristics in a way that makes it easier and faster to apply a heuristic when it is likely to yield accurate decisions. In the extreme case where the visitor has not heard of any of the players, none of the heuristics can be used. In this event, the visitor can resort to social heuristics, such as imitate the majority: Bet on the player on whom most others bet (Table 2).

The second known selection principle, after memory, is feedback. Strategy selection theory (Rieskamp & Otto, 2006) provides a quantitative model that can be understood as a reinforcement theory where the unit of reinforcement is not a behavior, but a heuristic. This model allows predictions about the probability that a person selects one strategy within a defined set of strategies. The third selection principle relies on the structure of the environment, as analyzed in the study of ecological rationality. For instance, the recognition heuristic is likely to lead to fast and accurate judgments if the recognition validity is high, that is, a strong correlation between recognition and the criterion exists, as is the case for tennis and other sports tournaments. There is experimental evidence that people tend to rely on this heuristic if the recognition validity is high but less so if the recognition validity α is low or at chance level ($\alpha = .5$). For instance, name recognition of Swiss cities is a valid predictor