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Recognising the recognition heuristic for what it is (and what it's not)

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Abstract

The diversity, ingenuity and differences of opinion displayed in the articles of the recent special issues on the recognition heuristic are testament to the power and theoretical fertility of a simple idea about the role of recognition in decision making. In this brief comment I mention a number of these papers, but my focus is on points of agreement and disagreement with the conclusions drawn by Gigerenzer and Goldstein (2011) in their review of a decade's worth of research on the recognition heuristic.

Keywords: judgement, ecological rationality, recognition, heuristic.

1 Less is more—more or less

Discovering that a higher degree of familiarity with a domain (e.g., the cities of one's own country vs. those of another) can lead to poorer inferential accuracy is an important insight. It is no wonder the aptly titled "More or Less" BBC radio show wished to demonstrate the effect to its listeners. It is robust, exceedingly simple to demonstrate (as I and I am sure many of us do regularly in undergraduate lectures) and—at least initially—counterintuitive. The conditions under which such effects hold have been discussed at length in the pages of the special issue (e.g., Beaman, Smith, Frosch, & McCloy, 2010; Hoffrage, 2011; Katsikopoulus, 2010; Smithson, 2010). However, a counter-intuitive effect, though it might have led to the "discovery" of the recognition heuristic (RH, Hoffrage, 2011), is not sufficient evidence for the claim that people use recognition information in the way that the RH dictates.

Recognition and evaluation

G&G (Gigerenzer & Goldstein, 2011) describe recognition and evaluation as two processes guiding the adaptive selection of the RH (i.e., recognition: "Do I recognize one object but not the other?" and evaluation: "If so is it reasonable to rely on the recognition heuristic in this situation?"). This formulation fits neatly with the interpretation that I and David Shanks proposed in 2004: "such an argument suggests that it is not pure recognition that determines an inference but recognition plus an appropriate reason for knowing why a particular object is recognized—or, at least, a correctly interpreted feeling of familiarity. It is not that an object is recognized and chosen without justification, but that the decision maker has a reasonable idea of why he or she recognizes the object *and makes an inference on the basis of this secondary knowledge.*" (Newell & Shanks, 2004, p. 933, emphasis added).

As we argued then, such a claim is far less newsworthy than the notion of a one-reason strategy for which further (i.e., secondary) knowledge is inconsequential (e.g., Goldstein & Gigerenzer, 1999). The recognition and evaluation process sounds more like the description of a person searching (memory) for information and making a trade-off (i.e., evaluating) between relying (solely) on recognition or considering how further information about the decision environment and the object (situation—in G&G's words) might affect a judgment (e.g., over-ride recognition, support it, etc.). Perhaps my confusion about these two seemingly different interpretations arises from a misunderstanding of the differences between cues, information and knowledge.

2 Cues, information and knowledge

G&G clarify that when in the past they said that further knowledge is inconsequential once a binary recognition judgment has been made (e.g., Goldstein & Gigerenzer, 1999, p.56)—what they meant was not knowledge, or information but cue-values. While I can see that there is a distinction between direct knowledge of the criterion (e.g., knowing – for a fact - the population of a city), and

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a cue value that might be indicative of a criterion (e.g., knowing a city has an airport) – to say that the former is knowledge/information but that the latter is not is to engage in obfuscation. Little wonder so many researchers took G&G at their (original) word and concluded that there was little evidence for a non-compensatory RH of the kind originally implied (e.g., Bröder & Eichler, 2006; Glöckner & Bröder, 2011; Hilbig & Pohl, 2009; Newell & Fernandez, 2006; Newell & Shanks, 2004; Oeusoonthornwattana & Shanks, 2010; Richter & Spath, 2006).

This clarification begs the question of when a cue becomes information and information becomes knowledge. If I search my memory to try to figure out if Milwaukee is bigger than Detroit there are lots of "things" I could use (beer companies, car companies, music labels, TV sitcoms)—are these cues, information or knowledge? G&G note in their open questions that choices between pairs of items in which only one object is recognised and some additional knowledge is known are better predicted by RH than when the object is merely recognised (Pohl, 2006—see also Newell & Fernandez 2006 Experiment 1 for the same result). Unless this extra knowledge is somehow defined as *not* a cue-value then it seems very difficult to reconcile such results with the notion of sole reliance on recognition (though see Marewski, Gaissmaier, Schooler, Goldstein, & Gigerenzer, 2010 for an attempt to do so.)

Perhaps more importantly—where do these cues and our knowledge of the direction of the cue-criterion correlation come from? G&G remind us that knowledge of such things (i.e., the recognition validity) is a prerequisite for the RH to operate, but how would a decision-maker know—how does she answer the "evaluation" question? How does she know when the environment is right—or, to put it in G&G's terms the ecological rationality criterion is satisfied?

3 Ecological rationality and adaptive decisions

A cornerstone of the fast-and-frugal approach is the idea that heuristics are selected on the basis of their ecological rationality in particular environments. Despite the fundamental importance of this idea, ecological rationality is often defined in reference to itself. For example, G&G state "ecological rationality asks in which environment a given strategy (heuristic or otherwise) excels and in which it fails" (p. 101). Ecological rationality is therefore defined as a property of a heuristic that can only be determined *from the perspective of the individual making the decision* once a heuristic has been tried in a given environment. If one needs to try it out first then how can ecological rationality drive the initial selection? Without question people can *learn* to select strategies (or accumulate more or less evidence, if you prefer) in environments that favour one type of strategy over the other (e.g., Newell & Lee, 2009; Rieskamp & Otto, 2006) but the demonstration of this ability has nothing to do with ecological rationality per se. It simply shows that people can learn to adapt.

The concept of ecological rationality also sits uneasily with situations in which heuristics lead to poorer decisions. G&G discuss at some length the peanut butter tasting experiments of Hoyer and Brown (1990) but fail to point out that the behaviour observed therein is a clear example of recognition being *maladaptive*. Choosing the inferior-tasting peanut butter because it is in the better-known-brand jar would not seem like a good choice. And yet the emphasis of the RH is that simple reliance on recognition can get you a long way. Why does the decision-maker faced with inferior peanut butter not realise that use of the RH is ecologically *irrational*? Perhaps the ease with which the brand name is processed leads to a biased judgment (Tversky & Kahneman, 1973).

These are important and interesting questions, and some recent work points towards possible ways of answering them (e.g., Katsikopolous, Schooler, & Hertwig, 2010). Moreover, by simply introducing these concepts important debates have been sparked (e.g., Dougherty, Franco-Watkins, & Thomas, 2008); but to conclude that "ecological rationality guides heuristic selection" is to go beyond the available evidence (see also Hilbig, 2010).

4 Individual differences and model fits

As noted by G&G analysis of mean levels of accordance with RH often belies important individual differences. For example, in the high validity condition of Newell and Fernandez (2006) Experiment 1, 12 participants chose the recognised object on less than 50% of occasions (with 3 never choosing it) and 11 chose it on more than 50% (with 5 always choosing it) giving a mean RH accordance rate of 55.5%. Can simple heuristics bounded by ecological rationality deal with such individual difference? G&G are optimistic that they can. An alternative approach is to test models (competitively against heuristics) that adopt a different set of assumptions about the distribution of behaviours in a given environment and see how they fare (e.g., Newell & Lee, in press; Lee & Cummins, 2004). I am also optimistic that new methods can shed light on how and why such individual differences might arise (e.g., Lee & Newell, 2011; see also the excellent suggestions in Tomlinson, Marewski, & Dougherty, 2011).

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Conclusion

The RH is the embodiment of a very simple yet powerful idea that can explain why we can sometimes benefit from ignorance. Its simplicity is also, however, its undoing. The single processing step of the RH (i.e., when only one of two objects is recognised, choose the recognised one) captures what some people do some of the time in some situations (and yes, sometimes what a lot of people do). But the RH is *not* a process model—in the sense of capturing *all of the processes underlying judgments based on recognition.* (Just as the Priority Heuristic is not a process model of all the processes underlying risky choice—see Johnson, Schulte-Mecklenbeck, & Willemsen, 2008). The crucial evaluation step (the one that "does all the work") is not captured by the RH; perhaps to understand *that* step better, research needs to shift away from environments where the RH is likely to succeed to those where it is not.

References

Beaman, C. P., Smith, P. T., Frosch, C. A., & McCloy, R. (2010). Less-is-more effects without the recognition heuristic. *Judgment and Decision Making, 5*, 258–271.

Bröder, A., & Eichler, A. (2006). The use of recognition information and additional cues in inferences from memory. *Acta Psychologica, 121*, 275–284.

Dougherty, M. R., Franco-Watkins, A. M., & Thomas,R. (2008). Psychological plausibility of the theory of Probabilistic Mental Models and the Fast and Frugal Heuristics. *Psychological Review, 115*, 199–213.

Gigerenzer, G., & Goldstein, D. G. (2011). The recognition heuristic: A decade of research. *Judgment and Decision Making, 6,* 100–121.

Glöckner, A. & Bröder, A. (2011). Processing of recognition information and additional cues: based analysis of choice, confidence, and response time. *Judgment and Decision Making, 6,* 23–42.

Goldstein, D. G., & Gigerenzer, G. (1999). The recognition heuristic: How ignorance makes us smart. In G. Gigerenzer, & P. M. Todd, (Eds.) *Simple heuristics that make us smart*, pp. 37–58. Oxford: Oxford University Press.

Hilbig, B. E. (2010). Reconsidering "evidence" for fast and frugal heuristics. *Psychonomic Bulletin & Review, 17*, 923–930.

Hilbig, B. E., & Pohl, R. F. (2009). Ignorance- versus evidence-based decision making: A decision time analysis of the recognition heuristic. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 35,* 1296–1305.

Hoffrage, U. (2011). Recognition judgments and the performance of the recognition heuristic depend on the size of the reference class. *Judgment and Decision Making, 6*, 43–57.

Hoyer, W. D., & Brown, S. P. (1990). Effects of brand awareness on choice for a common, repeat purchase product. *Journal of Consumer Research, 17*, 141–148.

Johnson, E.J., Schulte-Mecklenbeck, M., & Willemsen, C.J. (2008). Process models deserve process data: Comment on Brandstatter, Gigerenzer, and Hertwig (2006). *Psychological Review, 115,* 263–273.

Katsikopoulos, K. V. (2010). The less-is-more effect: Predictions and tests. *Judgment and Decision Making, 5,* 244–257.

Katsikopoulos, K. V., Schooler, L. J., & Hertwig, R. (2010). The robust beauty of ordinary information. *Psychological Review, 117*, 1259–1266.

Lee, M. D., & Cummins, T. D. R. (2004). Evidence accumulation in decision making: Unifying the "take the best" and the "rational" models. *Psychonomic Bulletin & Review, 11*, 343–352.

Lee, M.D., & Newell, B.R. (2011). Using Hierarchical Bayesian Methods to Examine the Tools of Decision Making. *Manuscript submitted for publication*.

Marewski, J. N., Gaissmaier, W., Schooler, L. J., Goldstein, D. G., & Gigerenzer, G. (2010). From recognition to decisions: Extending and testing recognition based models for multi-alternative inference. *Psychonomic Bulletin & Review, 17*, 287- 309.

Newell, B. R. & Fernandez, D. (2006). On the binary quality of recognition and the inconsequentiality of further knowledge: Two critical tests of the recognition heuristic. *Journal of Behavioral Decision Making, 19,* 333–346.

Newell, B. R., & Lee, M. D. (in press). The right tool for the job? comparing evidence accumulation and a naive strategy selection model of decision making. *Journal of Behavioral Decision Making.*

Newell, B. R., & Shanks, D. R. (2004). On the role of recognition in decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 30,* 923–935.

Newell, B.R. & Lee, M.D. (2009). Learning to adjust evidence thresholds in decision making. In N.Taatgen, H.van Rijn, J, Nerbonne and L. Schomaker (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society,* 473–478.

Oeusoonthornwattana, O., & Shanks, D. R. (2010). I like what I know: Is recognition a noncompensatory determiner of consumer choice? *Judgment and Decision Making, 5*, 310–325.

Pohl, R. F. (2006). Empirical tests of the recognition heuristic. *Journal of Behavioral Decision Making, 19,* 251–271.

https://doi.org/10.1017/S1930297500001364 Published online by Cambridge University Press

Richter, T., & Späth, P. (2006). Recognition is used as one cue among others in judgment and decision making. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 32*, 150–162.

Rieskamp, J., & Otto, P. E. (2006). SSL: A theory of how people learn to select strategies. *Journal of Experimental Psychology: General, 135*, 207–236.

Smithson, M. (2010). When less is more in the recognition heuristic. *Judgment and Decision Making, 5,* 230–243.

Tomlinson, T., Marewski, J. N., & Dougherty, M. R. (2011). Four challenges for cognitive research on the recognition heuristic and a call for a research strategy shift. *Judgment and Decision Making, 6,* 89–99.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology, 5*, 207–232.