

PHIL 5983: Rationality Seminar

University of Arkansas, Fall 2004

Topic: Simple Heuristics III: Finding Mates, Raising Children, and Summary

Readings: *Simple Heuristics* (Chapters 13, 14, and 16)

*I am providing notes for Chapters 14 and 16, and Matt will cover Chapter 13 in his presentation.

“Parental Investment by Simple Decision Rules”

*Q: How should parents go about deciding how to divide resources amongst their children? [The more general question might be: How should we divide resources to those in need, or to those with potential to thrive?]

--We can think of this as an economic, or a biological, question.

--In the biological case, success is in terms of offspring raised to healthy adulthood. The problem of allocating resources, D&T claim, is difficult only because there are varying chances of success. But are they correct in this claim?

“As mentioned before, if all offspring will provide equal expected returns on parental investment, then parents should treat them all equally.” (311)

This does not seem to follow.

*One simple rule: Treat each equally on the basis of need.

“Among birds, for example, chicks often beg for food when hungry. If amount of begging is an honest and accurate signal of need (e.g., Godfray, 1991), parents would then be expected to feed their chicks according to their begging intensity to achieve investment equality.” (311)

--But this ignores the differences in expected returns. Instead, a rule should be followed that biases allocations in favor of those with higher expected returns. In particular, older children, who have a greater chance of “success” in virtue of having made it this far, should be favored.

--A point about ecological rationality: It is likely that there is no single rational strategy, but different rational strategies for different environments.

“Parents, then, might be expected to make environmentally contingent investment decisions. In poor environments they could choose the simple strategy of investing more in older offspring, while in more abundant environments they *might* do best to invest on the basis of something else.” (312)

*D&T simulated feeding strategies of bluebird parents. The success of a feeding strategy was judged by how many “grams of chick” leaving the nest it produced. (313) Food amount and distribution varied. 6 strategies were tested. These were all examples of one-reason decision making. (314)

--The most successful strategy will be *ecologically* rational, because it will depend on metabolic facts about the chicks, and on the food distribution in the environment.

--Unsurprisingly, different strategies were most successful in different environments. (316-317)

*The simple heuristics were compared against more sophisticated “optimizing” strategies. The simple heuristics prevailed.

--But doesn't the following strategy, which is one of the optimizing varieties, seem implausible from the start?

“In the first maximizing strategy, dubbed “bug digested,” parents give the current bug to the chick whose eating of it will maximize the total weight of all chicks in the nest at the time that it finishes digesting the bug.” (318)

Isn't this like trying to maximize life-long utility by maximizing utility day-to-day? (And the other two “optimizing” strategies are similar in this regard.)

*Since natural selection has likely found something close to the optimal investment strategy, we can test the heuristics against the strategies of actual bluebirds. In fact, the most successful of the simulated strategies are the strategies used by real-world birds (though data are lacking for bluebirds in particular). (322-323)

*Overstatement?: “Birds are a good model for the study of human parental investment.” (323)

--D&T compare the birds' strategies to inheritance strategies in humans.

--An interesting hypothesis:

“Birth order effects are elusive because the nature of the effect depends on environmental circumstance, a variable none of these previous studies on humans have controlled for.” (324)

“What We Have Learned (So Far)”

*Note the opening quotation, by Wundt. This quotation concerns whether the norms of logic carry over to psychology.

*Classes of Heuristics:

- Ignorance-based decision making (e.g., the recognition heuristic)
- One-reason decision making (e.g., take-the-best)
- Elimination heuristics (QuickEst and Categorization by Elimination)
- Satisficing (e.g., mate search)

*Their understanding of rationality:

“We began this book with a triadic vision of bounded, ecological, and social rationality. The three are intimately linked: The success of boundedly rational heuristics depends on their ability to exploit the information structures in the ecological and social environment. Thus, the interaction of these three perspectives is essential for our notion of rationality.” (360)

And its pragmatism:

“Thus, we see rationality as defined by decisions and actions that lead to success in the external world, rather than by internal coherence of knowledge and inferences. Theories of mind that focus on internal coherence have led, in artificial intelligence, economics, and elsewhere (see chapter 15), to models that assume that an individual must create elaborate representations of knowledge and solve impressive equations when making up its mind. The challenge ahead is not to construct models of omniscient minds, but rather of adaptive minds that can act quickly and reliably in their environments.” (362)

--And note the last 3 paragraphs, p. 365. Just what, exactly, are they claiming here??