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Maximising utility does not promote survival. Hence, the opportunity cost of a task cannot explain its difficulty

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Abstract:

We argue that maximising utility does not promote survival. Thus, there is no reason to expect people to modulate effort according to a task's opportunity costs. There is also no reason why our evaluation of the marginal opportunity costs of tasks should predictably rise with repetition. Thus, the opportunity cost model cannot explain why tasks typically become harder over time.

Main Text:

Kurzban et al. seek to explain two phenomena: (1) why cognitive tasks typically *feel* increasingly difficult with repetition, and (2) why *performance* in these tasks degrades with repetition. For instance, in a task involving the continuous multiplication of four-digit numbers over several days, subjects experienced the task as increasingly difficult and at the same time became less proficient at the task (Arai 1912; Huxtable et al. 1946).

Kurzban et al. offer a common explanation of both target phenomena relying on three claims. They argue: (a) that the difficulty we experience in performing cognitive tasks reflects our subconscious evaluation of the next best alternative task (this constitutes the *marginal opportunity cost* of the task -- it is the value we miss out on in virtue of performing that task); (b) that the difficulty we experience in performing cognitive tasks reduces our proficiency in performing those tasks; and (c) that when we repeatedly perform cognitive tasks, our evaluation of the opportunity cost of these tasks will steadily increase. These three claims together imply that people who repeatedly perform cognitive tasks will experience increasing difficulty and, as a result, will manifest steadily degraded performance. In our commentary, we wish to challenge claims (a) and (c).

First, what reason is there to think that the difficulty we experience in performing cognitive tasks should reflect our evaluation of the marginal opportunity cost of those tasks? Kurzban et al. offer an evolutionary answer, arguing that it makes good adaptive sense for an organism to modulate its expenditure of cognitive resources on a task according to the task's expected utility. (Kurzban et al appear to take the utility of a task to be determined by its contribution to the organism's well-being.) But we question the presupposition that there is any relation between a task's expected utility and its survival value. For instance, neither my judgement that rock-climbing is good for me nor the truth of that judgement (entailing that rock-climbing is indeed good for me) implies that this activity is conducive to my survival. It may or may not be the case that our most basic motivation is to maximise utility (our well-being). But even if we are, in fact, utility maximisers, there seems no reason to think that being a utility-maximiser is adaptively optimal. This point is especially clear if we analyse well-being in terms of preference-satisfaction: there is no reason to assume that the actions that maximise my preference-satisfaction will also maximise my chances of survival.

But even if we grant the supposition that maximising utility is adaptive, it seems that an organism would benefit most from being disposed, not to *modulate* its commitment to a task according to the task's expected utility (as the model entails), but rather to *fully* commit its resources to the cognitive task with the highest expected utility, and to *be prepared* to shift resources as soon as some other task becomes more beneficial. Thus, even if the value of an alternative task is increasing, it would make no sense for an organism to shift any resources to that task until the tipping point where the alternative task is, in fact, more valuable than its current task. By analogy, if I think Obama is the best candidate, surely I should devote all my resources to his re-election unless I come to think that Romney is the best candidate, all things considered. However, I may discover that Romney is a better candidate than I had thought he was - my evaluation of him may indeed be rising; still, this gives me no reason to allocate *any* resources towards his election until I think he is the *better* candidate.

Of course, as Kurzban et al. explain in section 2.4.2, it may sometimes be the case that the best task available to an individual involves a sharing of cognitive resources between two activities. In their example, a participant in an Arai-style math task might do best by dividing her 'mental processors' between performing the math task and daydreaming. Kurzban et al. argue that as a result of experiencing the math task as effortful, the subject may well end up

performing the optimal mixed-task of math-plus-daydreaming. However, an optimal mixed task may not always be available. Often, the next best alternative task will be entirely incompatible with the task at hand. In these cases, according to the model offered by Kurzban et al., people will nevertheless experience aversive effort corresponding to the opportunity costs of their behaviour. For instance, even the subject who performs an optimal math-daydreaming task will, according to the model, continue to experience this task as effortful corresponding to the value of the next best task available. But, as we have already argued, there is no clear benefit in having such a disposition.

Now, what reason is there to think that our evaluation of the marginal opportunity cost of a task will predictably *rise* when the task is repeated over a brief period of time? In section 2.4.3 Kurzban et al. argue that a bias towards exploring new tasks will protect organisms from over-investing in tasks whose value they overestimate. However, the authors provide no reason for thinking that we are in more danger of overestimating the value of our tasks at hand, rather than alternative tasks. Of course, a task will often *seem* to lose value with repetition simply in virtue of its increasing *sunk costs*. But sunk costs should not figure in our calculations about the rationality of a course of action. Ultimately, the account offered in Kurzban et al. explains one mystery (why cognitive tasks reliably feel harder over time) only by substituting another mystery (why one's evaluation of the marginal opportunity costs of a task should increase - reliably - over time).

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