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Dear Professor Hamilton,

Please consider our paper, entitled “Variable and sub-optimal responses to a choice problem are a persistent default mode”, for publication in *the Quarterly Journal of Experimental Psychology*. Our paper brings together ideas and methods from psychophysics, human decision-making and animal learning to understand how humans approach choice problems under uncertainty. The manuscript is original, not previously published, and not under consideration elsewhere.

The optimal solution to the decision problems we present in this paper follows a simple logic: when tasks are easy, it is reasonable to try and accomplish both. When tasks are difficult and resources are limited, it is better to focus on accomplishing one. As we have shown in previous work (Clarke and Hunt, *Psychological Science* 2016), and replicate here, the vast majority of people do not follow, or even approach, this rational strategy, despite large gains in performance that could be achieved if they did. In the paper we are submitting for your consideration, we guide people to make more rational choices. When we remove this guidance, we find that participants immediately return to a variable, sub-optimal pattern of choices. The results demonstrate that even when it is clear that people *can* easily construct and implement successful decision rules, variable and idiosyncratic responses to choice problems are a strong and persistent default.

We came to this research through an interest in understanding the process of selecting fixations during sequences of eye movements, and the results have implications for even this seemingly simple, specific question. Since expanding our focus to include analogous kinds of decisions, we have discovered our results have implications for understanding human behaviour in a wide range of problem-solving situations. Concepts from animal learning provide a framework within which human decisions that may otherwise seem irrational can be considered instead in the context of the dynamic and unpredictable environment in which our decision-making capabilities evolved. For this reason, we believe the results of our experiments would be of interest to the broad readership of QJEP. We have employed a simple, uncluttered experimental design, and present a transparent and unbiased approach to data processing and presentation. In that spirit, our data and analysis scripts are publicly available, and the critical experiment in this set was pre-registered. We have included in Supplementary Materials two further experiments that replicate the pattern of results in the main paper, and our plots show all the individual data from the experiments reported in the main text. There are a few t-tests where they are appropriate, but our main focus is on presenting, modelling and interpreting not only the overall patterns in the data, but the variability as well.

We look forward to hearing your opinion and thank you in advance for your consideration of this article for publication in QJEP.

Kind regards,

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