Professor Brockmole,

Please find enclosed for submission a manuscript entitled “A Circular Diffusion Model of Continuous-Outcome Source Memory Retrieval” for publication in the Psychonomic Bulletin and Review.  
 In this work, we apply the circular diffusion model of Smith (2016) to data from a continuous-outcome source memory task, similar to that of Harlow and Donaldson (2013). Our novel contribution is that we model both response times and response outcomes to constrain the circular diffusion model, which provides an elaborated account of the joint distribution of response times as well as response outcomes. The motivation for this was to investigate whether the appearance of a threshold in response outcomes found by Harlow and Donaldson (2013) could be attributed to properties of decision-making, specifically trial-to-trial variability in drift rate in the diffusion model. We compare three models: 1) A single diffusion process with trial-to-trial variability in drift rate, 2) A mixture of two diffusion processes, one with positive drift that does not vary from trial-to-trial, and a second zero-drift process that represents discrete guessing, and 3) a similar mixture model, but with trial-to-trial variability in the positive drift process. Additionally, we also conditioned participants’ source responding on their confidence in an old/new recognition task to investigate whether source responses for items recognised with high confidence would appear thresholded.

Model selection indicated that the thresholded diffusion models were preferred over the continuous diffusion model, suggesting that when accounting for decision-making, a retrieval threshold still appears to underly retrieval from the memory process. These results are congruent with the original findings from Harlow and Donaldson (2013), and also support thresholded and dual-process models of episodic memory more broadly.

We recommend the following reviewers for this work. **Caren Rotello** is an expert in source memory modelling. **Chris Donkin** (University of New South Wales) and **Jeff Starns** (University of Massachusetts, Amherst) are familiar with several of the issues raised in the manuscript, particularly diffusion modelling and modelling response times. **Rob Nosofsky** (Indiana University Bloomington) is also an expert in response time modelling and has worked with threshold models of visual working memory. **John Wixted** (University of California, San Diego) and **David Kellen** (Syracuse University) are experts in memory modelling, and have contributed to the threshold and continuous model debate that our work is situated in. **Joshua Koen** (University of California, Davis)is an expert who has worked with dual-process models of memory. **Iain Harlow** would be an excellent candidate to review this work but is to our knowledge no longer working in academia. We would prefer not to have **Andrew Yonelinas or Ken Malmberg** be assigned as a reviewer for this submission.

Jason Zhou