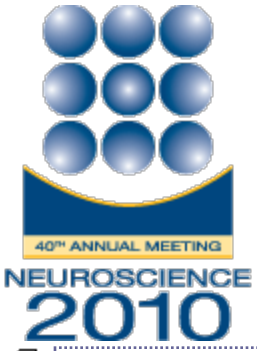

Control/Tracking Number: 2010-S-13721-SfN
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Rodents effectively learn statistics of hidden food rewards in a novel search task

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Abstract: Choosing where to explore in an unfamiliar environment requires integration of both bottom-up visual cues and top-down knowledge about the task and environment. In our previous work (Chukoskie et al., 2005, 2007, 2008), we studied visual search for hidden (nonvisible) targets with human and non-human primates. In the current work, we extend our investigations of search behavior into rodents, and find a close correspondence between primate visual and rodent exploratory behaviors. Eight Long-Evans rats were trained to search for hidden sucrose pellet rewards in a plexiglass semi-circular arena. The arena contains 96 food wells distributed evenly across 8 radially-arranged arms marked by clear dividers. A single well in the arena is baited on each trial. Animals begin each trial in a central chamber. The rat begins searching for the baited well by exploring the arms serially. A trial ends when the baited well is found. Across trials in a session, the baited wells form one of several possible spatial distributions: small (within one arm) or large (spanning up to three arms), peaked or uniform, depending on the condition. Video capture and tracking was facilitated by the AnyMaze tracking system (Stoelting Co., Chicago, IL).
Similar to the behavior we observed using the eye movement search task in humans, rodents engaged in the hidden reward search task quickly and efficiently exploited the spatial statistics of hidden rewards. The reinforcement learning model that describes the eye movement search data in terms of the speed of learning and the asymptotic size of search can similarly be applied to data from the rodent search task. By drawing on the similarities between the statistics of eye gaze and rat head and body position during analogous search experiments, we hope to clarify the behavioral subtleties of search performance and

relate them to physiological correlates.
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Presentation Preference (Complete): No Preference
Linking Group (Complete): None selected
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Briefly explain (500 characters) the timeliness and importance of your research, and the overall theme of your abstract or group.

: Many animal species engage in search while foraging for food or other rewards. We describe a behavioral task and model that bring together data from multiple species (humans, rhesus macaques and rats) for consideration in a common framework.

Theme and Topic (Complete): F.03.b. Decision making ; F.02.g. Appetitive and incentive learning and memory
Keyword (Complete): search ; decision making ; reward
Support (Complete):
Support: Yes
Grant/Other Support: : Temporal Dynamics of Learning Center, an NSF Science of Learning Center

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