EVOLUTION AND COGNITION LAB

Using virtual reality to study human foraging behavior

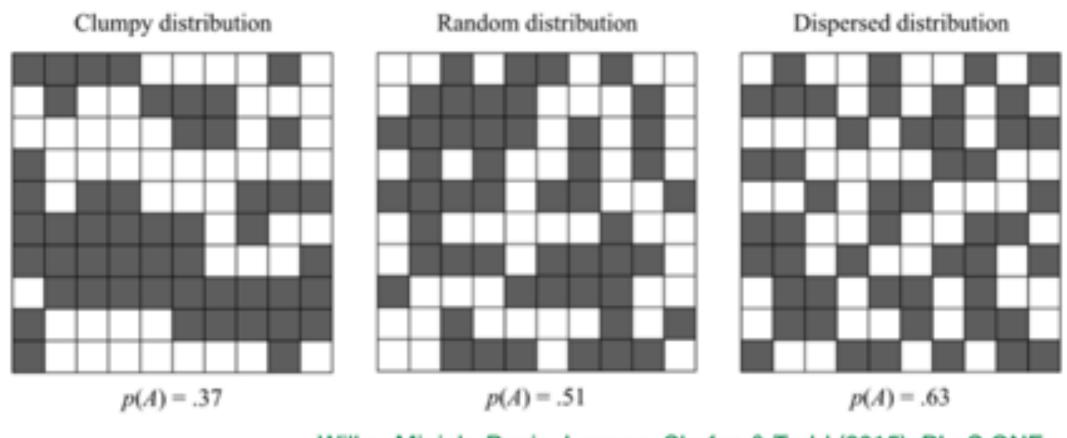
Noah Chicoine¹, Megane Porga², Belisena Hall², Sarah Moran², Katelynn Mays², Schuyler Meyer³, Alex Lee³ & Andreas Wilke²

¹ Department of Mathematics, Clarkson University, Potsdam, NY, USA ² Department of Psychology, Clarkson University, Potsdam, NY, USA ³ Department of Communication and Media, Clarkson University, Potsdam, NY, USA

Background

 Our previous research suggests that the hot hand phenomenon, a Virtual reality allows us to conduct a foraging study in a small lab space as tendency to perceive illusory streaks of clumps in sequences and grids, is opposed to outside, where weather may not permit testing conditions. The a human universal tied to humans' evolutionary history of foraging. In past virtual reality software also allows us to control exactly how the foraging experiments, we showed that the hot hand phenomenon helps to explain scenario looks and works in the study, allowing us to strategically place the difficulty people have in reasoning about randomness in situations like resources in space to explore variation in participants' search strategies. gambling and games of hide and seek. In this new study, we examine the The virtual reality headset and controllers can record actions such as turn behavior and decision strategies made by humans in actual simulated patterns and movements indicating searching an area that can be statistically foraging scenarios. By letting participants search for food resources in a examined to see where participants believe resources are clumped or are Virtual Reality environment, we will gain insight into how people decide scarce. where to search and when they give up searching at a local site. Recorded time and movement data will capture search patterns in specific statistical distributions as well as what changes in search strategies occur when participants respond to the presence and absence of resources.

Misperception of randomness



Wilke, Minich, Panis, Langen, Skufca & Todd (2015). PLoS ONE.

Is hot hand a cognitive fallacy?

The expectation of streaks in sequences of hits and misses whose probabilities are, in fact, independent (e.g., coin tosses, basketball shots).



Applications of hot hand research?

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Daydreamer	Summary	Fruitshaker	History Fruit
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⁷ 2.	Rounds lost: 🔕 29	⁷ 2.	2. 🔮
, 1 , 1	Rounds to go: 212	, 1	э. 🔮
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de alfana			10.
structions			11.
You may now choose free	ly between the Fruitshaker and t	e Daydreamer slot	12.
machines for placing your	bets. Try to win as many rounds		13. 🧕
	n in the center of the screen. g a slot machine and clicking on one	of its han sumbols	14. 🍒
	then appears on the display of the		15. 🛃
round. (Your score is auton	atically updated and displayed at th		16. 👰
the Summary box.)			17. 🌠
	Round' button to make another bet. I where you again pick a slot mach		18. 🌠

rounds is identical to this one, where you again pick a slot machine and choose which of the two symbols you think will be displayed next. On each side of the screen you will see a short History of the symbols that each of the machines displayed in previous rounds. The latest symbol will always be displayed on the top of the list

istory Fruitshake				
last				
2.	(a)			
3.				
4.				
5.	(a)			
6.	(a)			
7.				
8.	(a)			
9.				
10.	(a)			
11.				
12.				
13.	(B)			
14.				
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16.	(B)			
17.				
18.				
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Virtual reality foraging



Tutorial

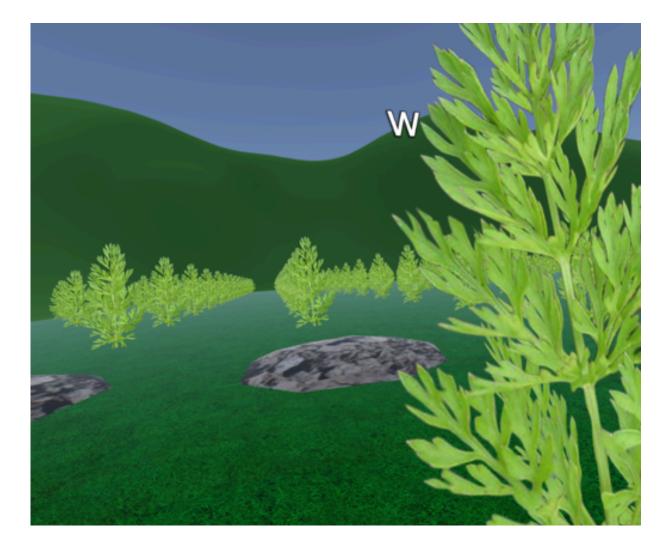
Before the main experiment, participants partake in a short tutorial designed to familiarize them with navigating the program used in the main experiment as well as adjusting to being in a virtual reality environment. The tutorial is held within a two by two grid of carrot stems. Directions are projected in the sky, teaching participants how to move around and pluck carrot stems.

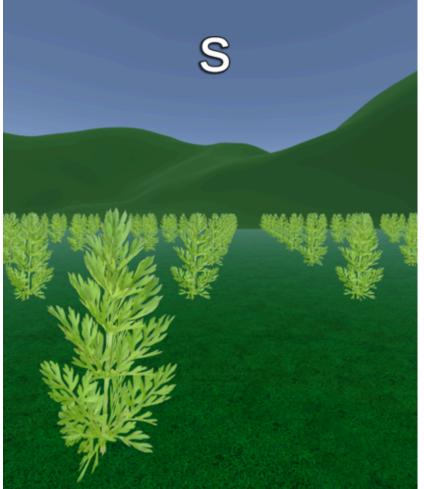




Main experiment

Once the tutorial has been completed, the program will automatically bring participants to the main experiment and start collecting data. The environment of the main experiment consists of a twenty by twenty grid of 400 carrot stems, half of which have carrots attached beneath the ground. Participants are tasked with collecting as many carrots as possible with an allotted 200 plucks. Time and movement data is recorded by the virtual reality software during the experiment. Pictures of the VR experiment are shown below.

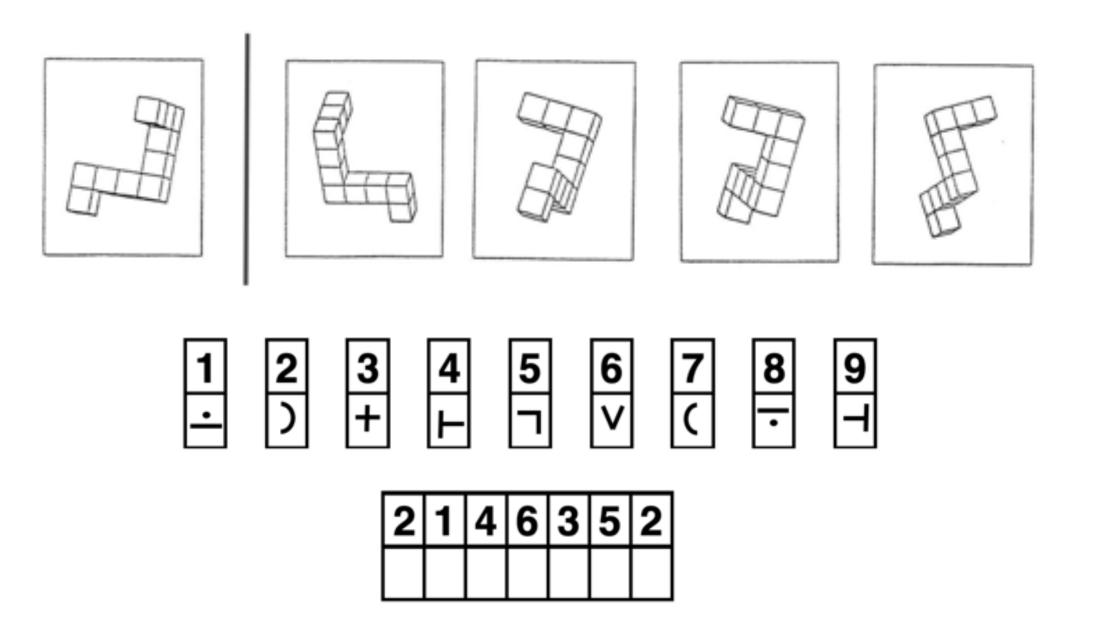




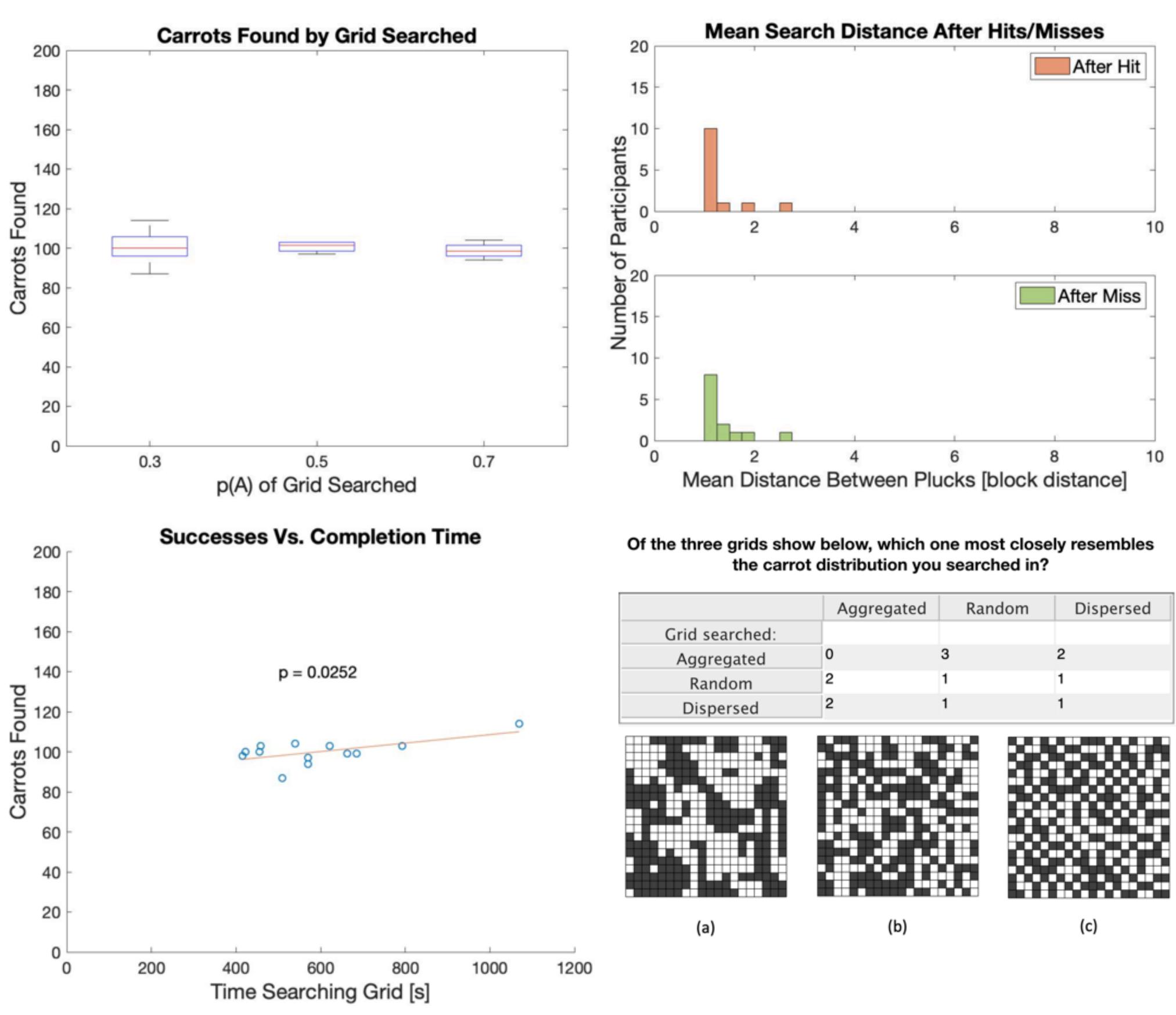


Spatial and general cognitive ability

Several measurements, like a mental rotation task and a spatial memory test will measure cognitive abilities relating to foraging and spatial reasoning. Other assessments—such as digit span, digit substitution and a trails making task will collect data on individual differences in cognitive processing speed.



First results



60th Annual Meeting of the Psychonomic Society Montreal, Quebec, Canada

Pass- Score

Fail 2, 1, or 0

