

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

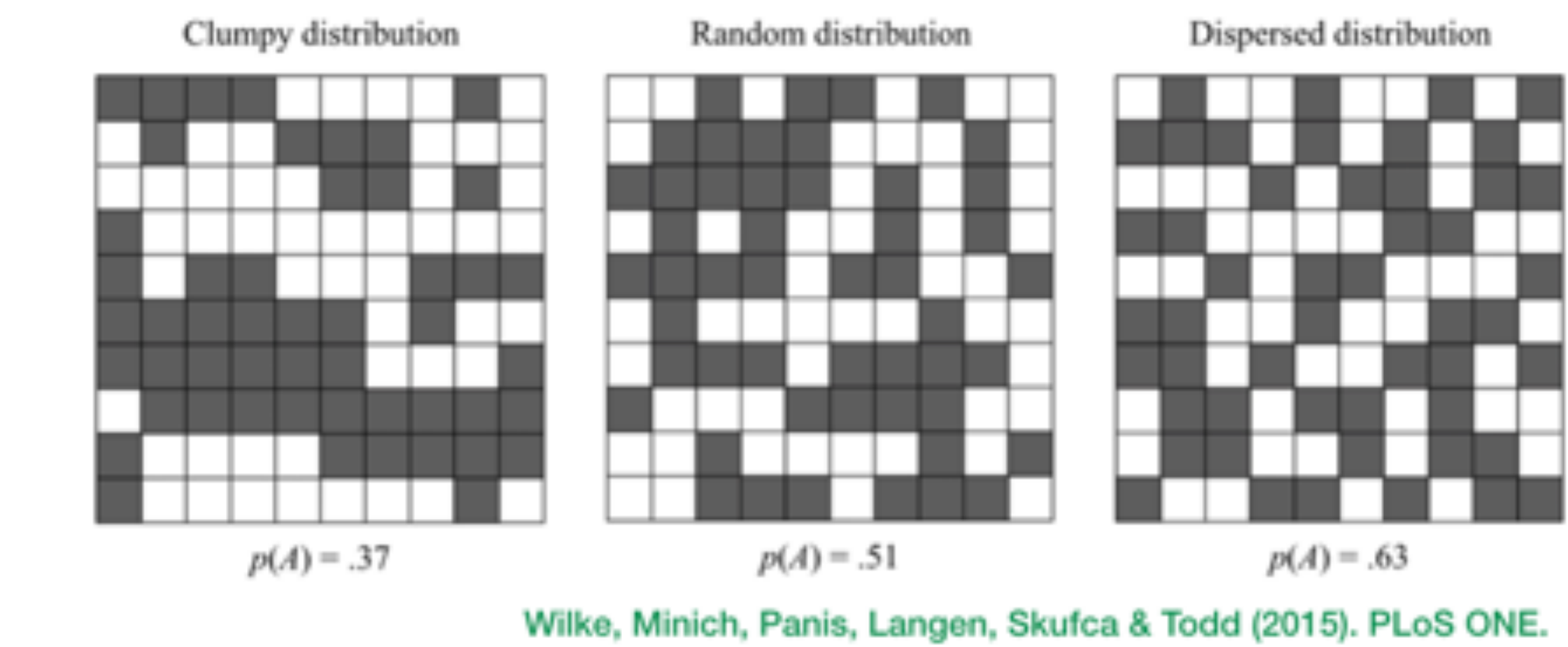
³ Department of Communication and Media, Clarkson University, Potsdam, NY, USA



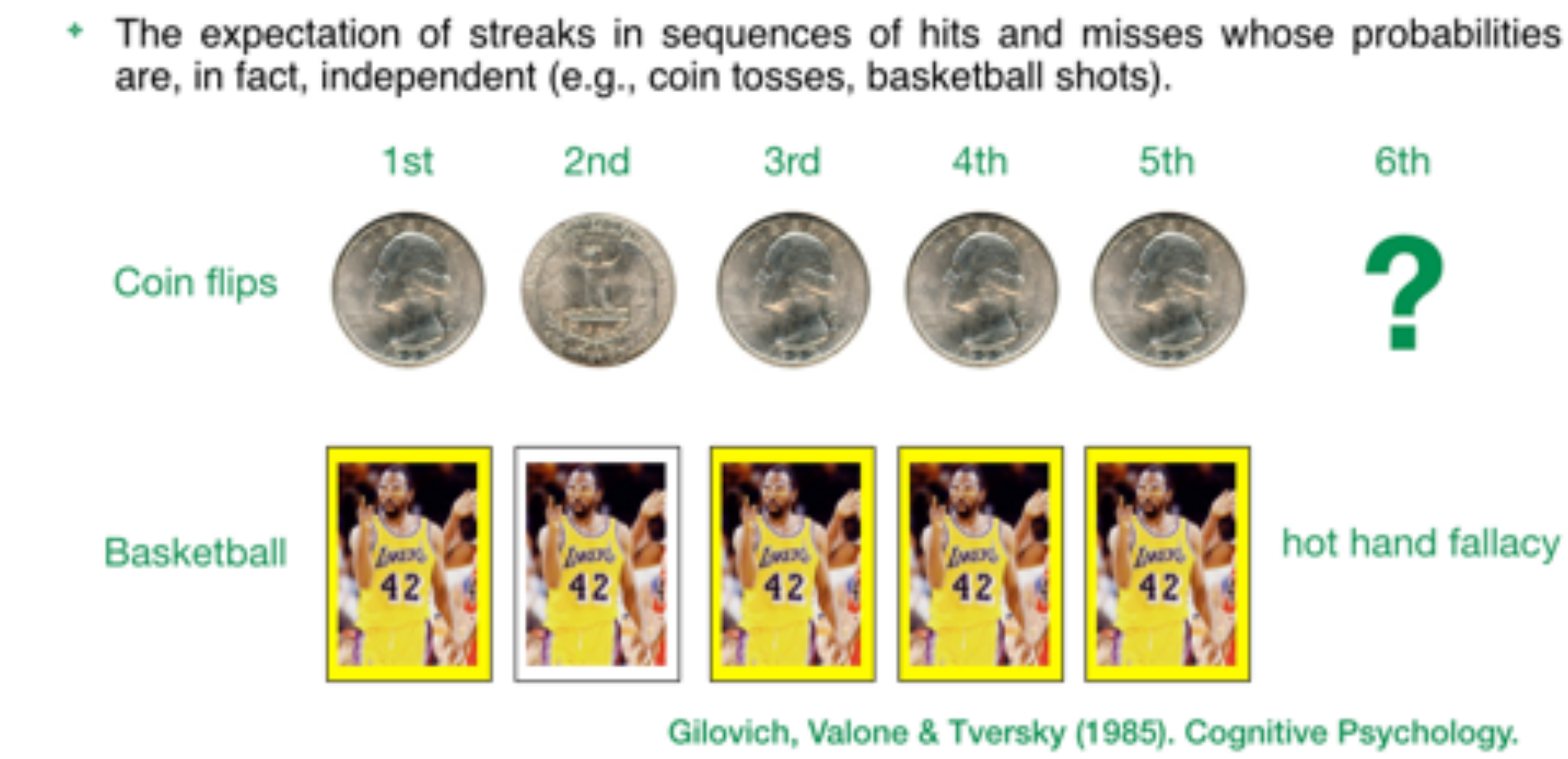
Background

Our previous research suggests that the hot hand phenomenon, a tendency to perceive illusory streaks of clumps in sequences and grids, is a human universal tied to humans' evolutionary history of foraging. In past experiments, we showed that the hot hand phenomenon helps to explain the difficulty people have in reasoning about randomness in situations like gambling and games of hide and seek. In this new study, we examine the behavior and decision strategies made by humans in actual simulated foraging scenarios. By letting participants search for food resources in a Virtual Reality environment, we will gain insight into how people decide 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.

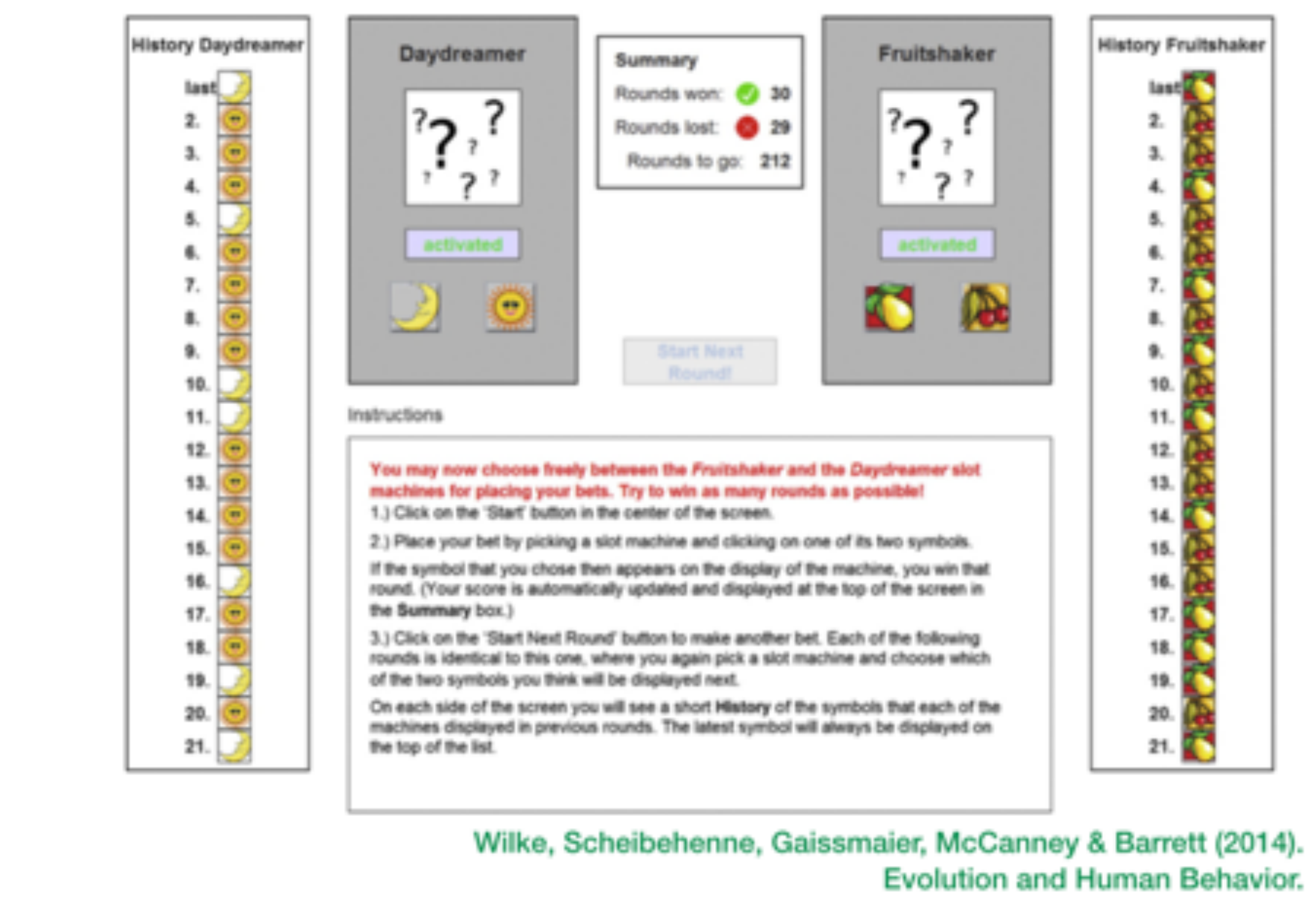
Misperception of randomness



Is hot hand a cognitive fallacy?



Applications of hot hand research?



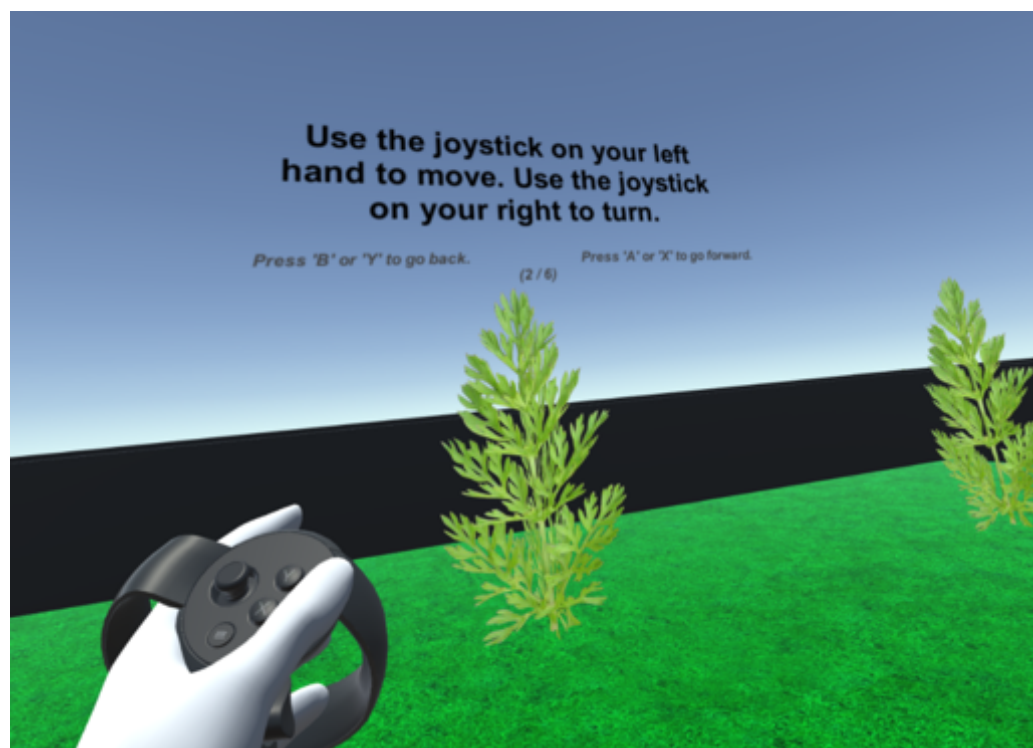
Virtual reality foraging

- Virtual reality allows us to conduct a foraging study in a small lab space as opposed to outside, where weather may not permit testing conditions. The virtual reality software also allows us to control exactly how the foraging scenario looks and works in the study, allowing us to strategically place resources in space to explore variation in participants' search strategies.
- The virtual reality headset and controllers can record actions such as turn patterns and movements indicating searching an area that can be statistically examined to see where participants believe resources are clumped or are scarce.



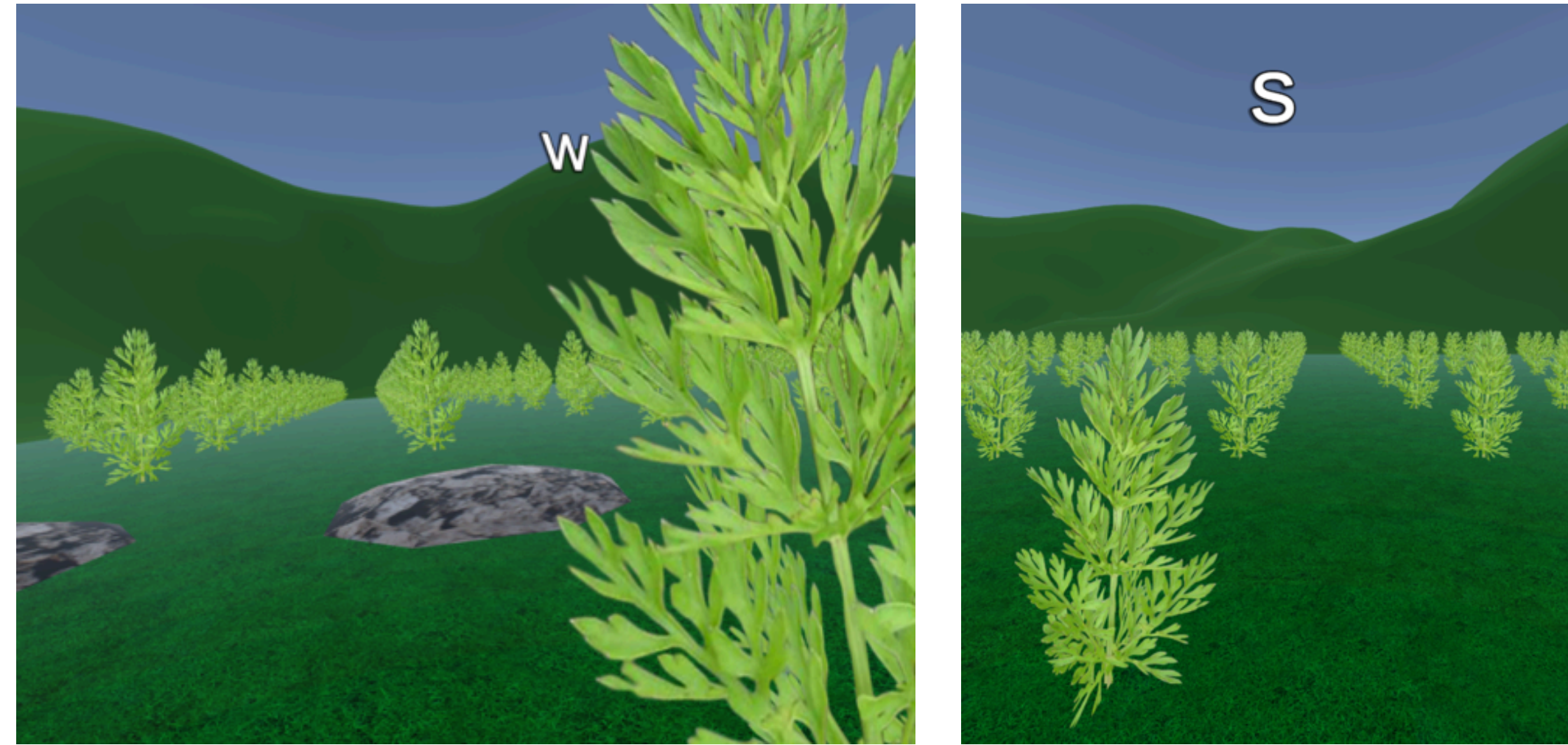
Tutorial

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.



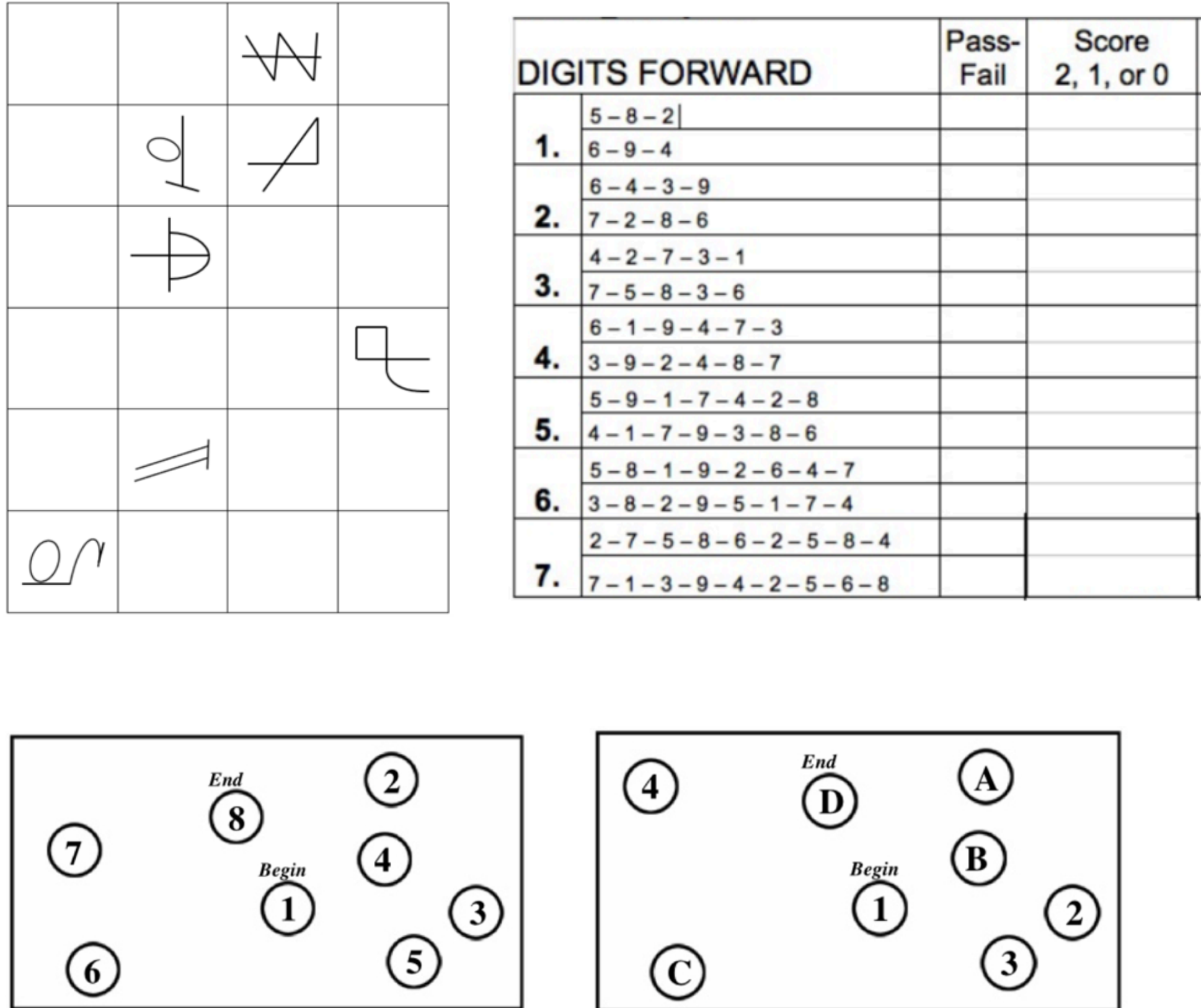
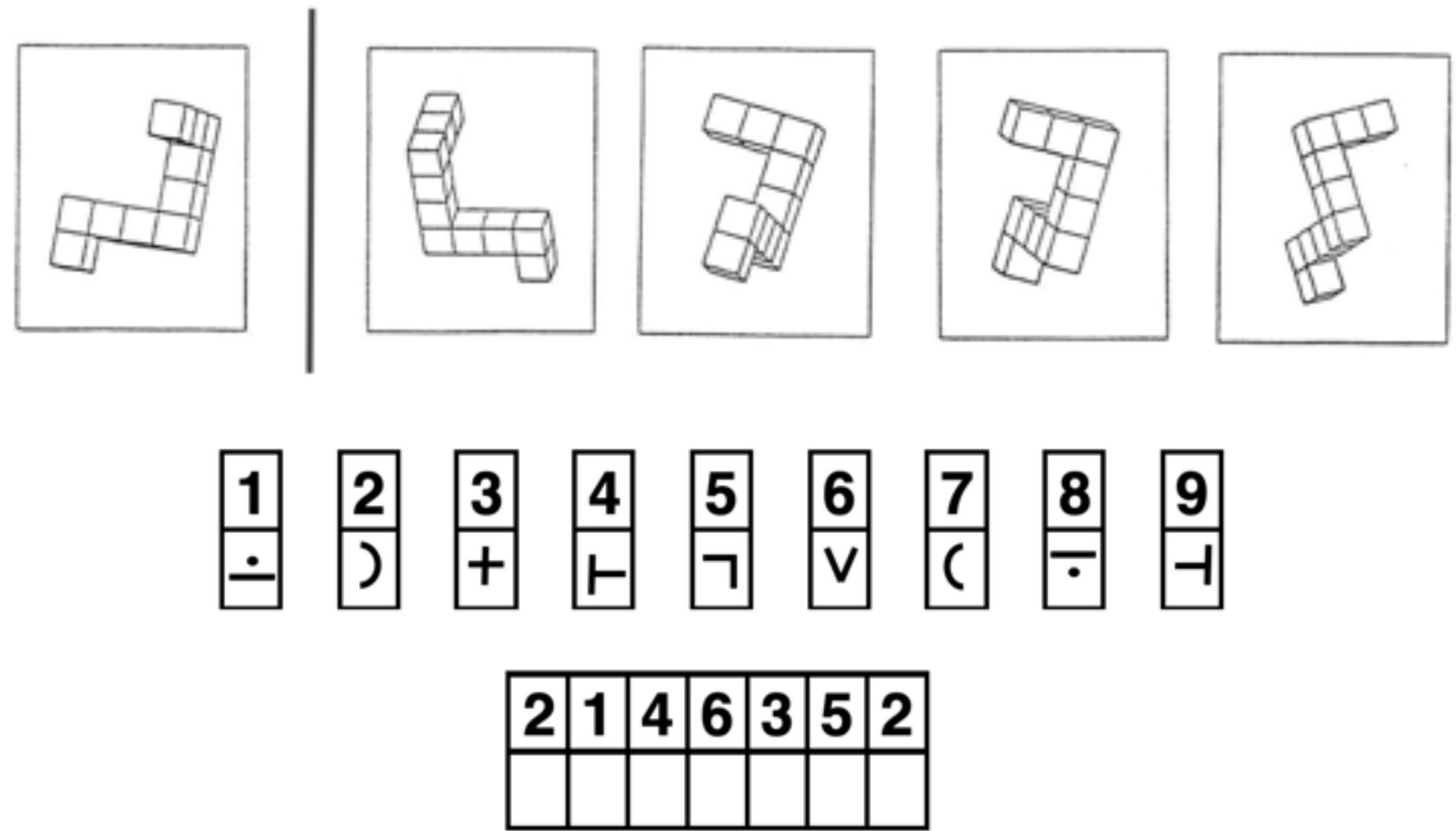
Main experiment

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

