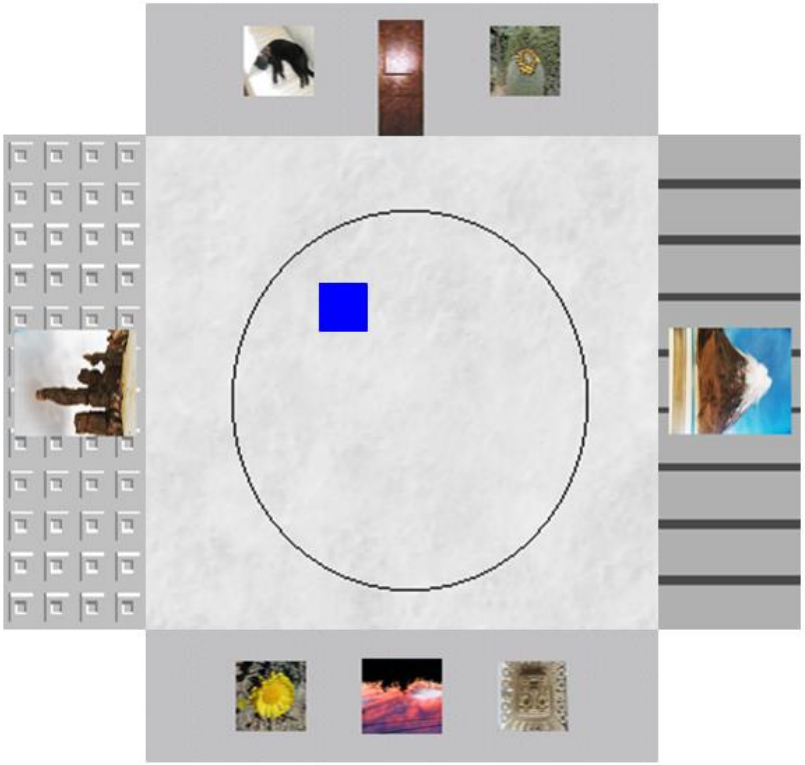
Arena Example

Functional Blinding?

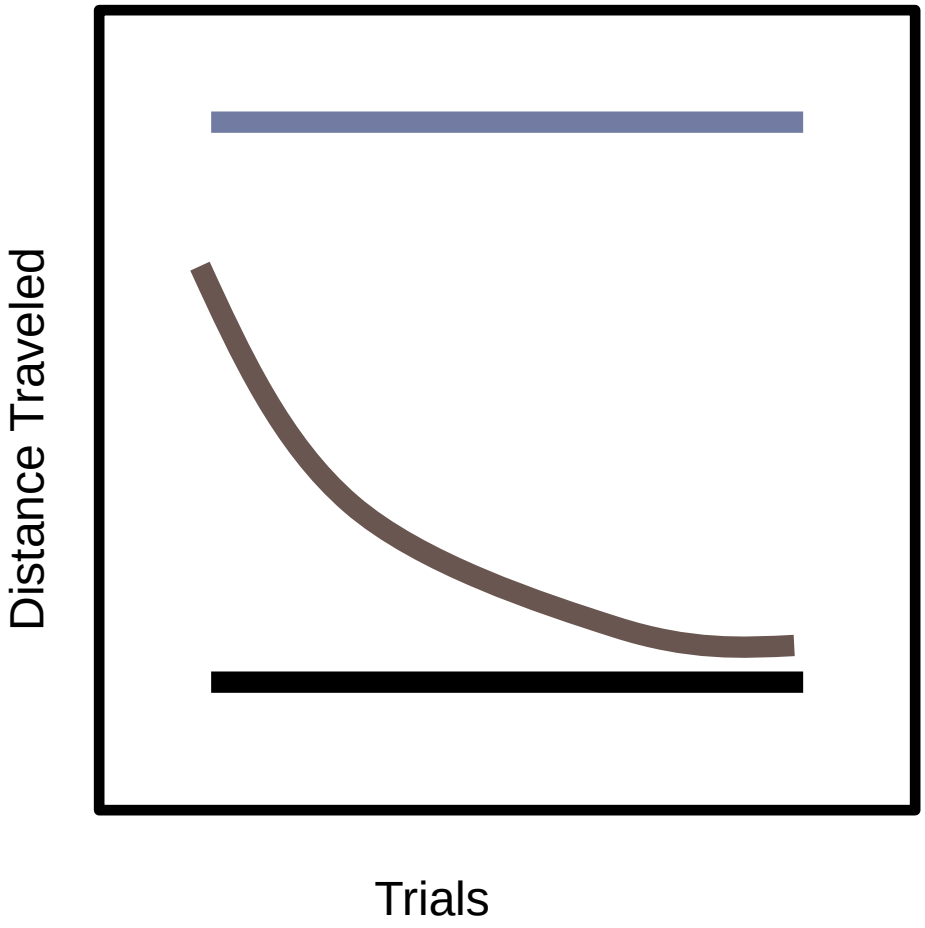
Apparatus



- Computer-Generated Morris-Water Maze (CG-Arena)
- Objective:
  - Find a fixed, invisible target
- Instructions can modify navigation behaviors
- Neural Underpinnings

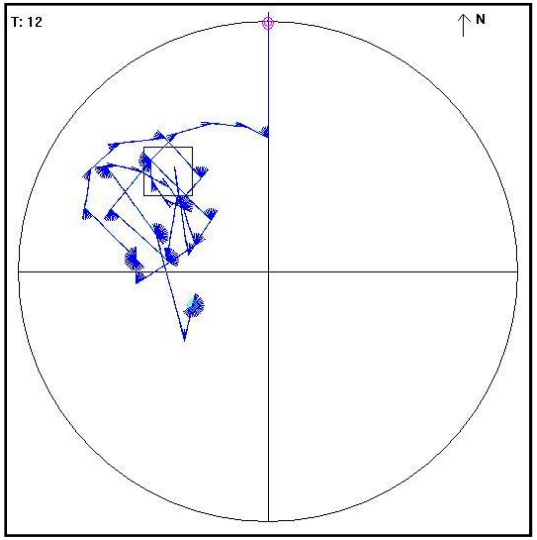
Previous Findings

- Prior experiments have shown an "Instructions Effect"
  - Normal Acquisition (A)
  - Congruent (A+)
  - Incongruent (A-)
- Behavioral and Cognitive Theories
  - Learn target place
- What is going on?

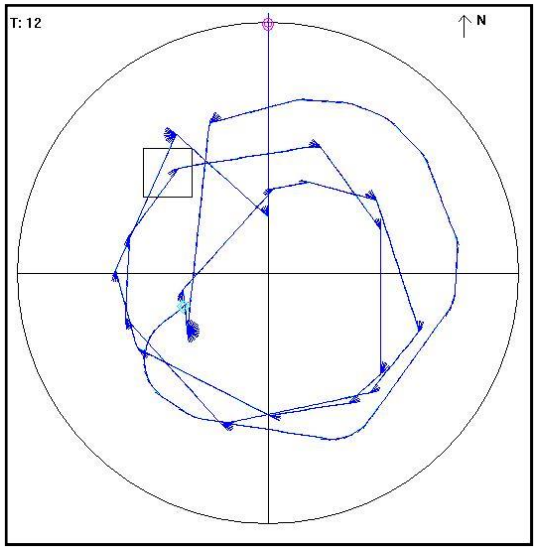


Typical Search Patterns

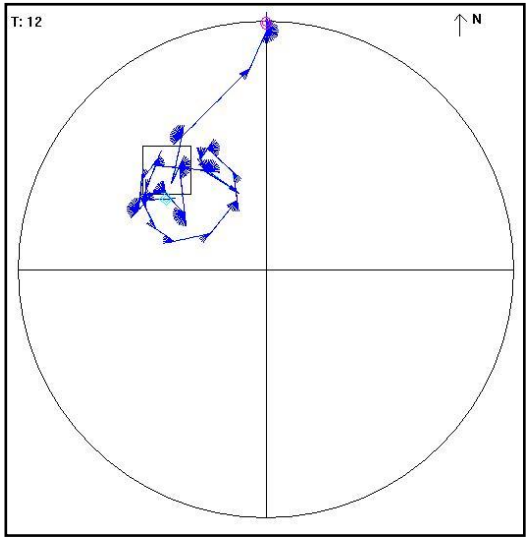
A: Acquisition



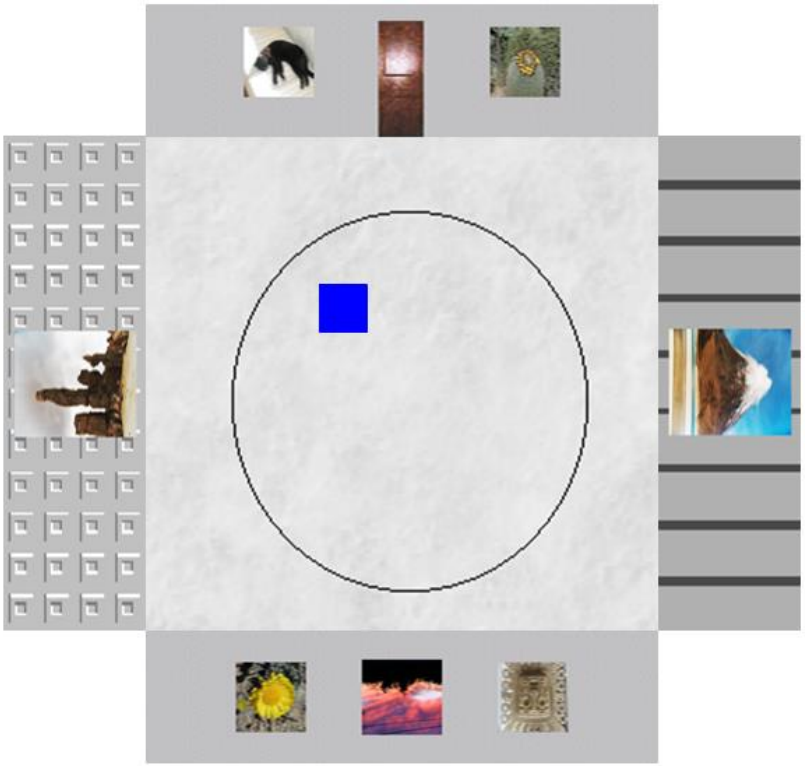
A-: Disadvantageous



A+: Advantageous

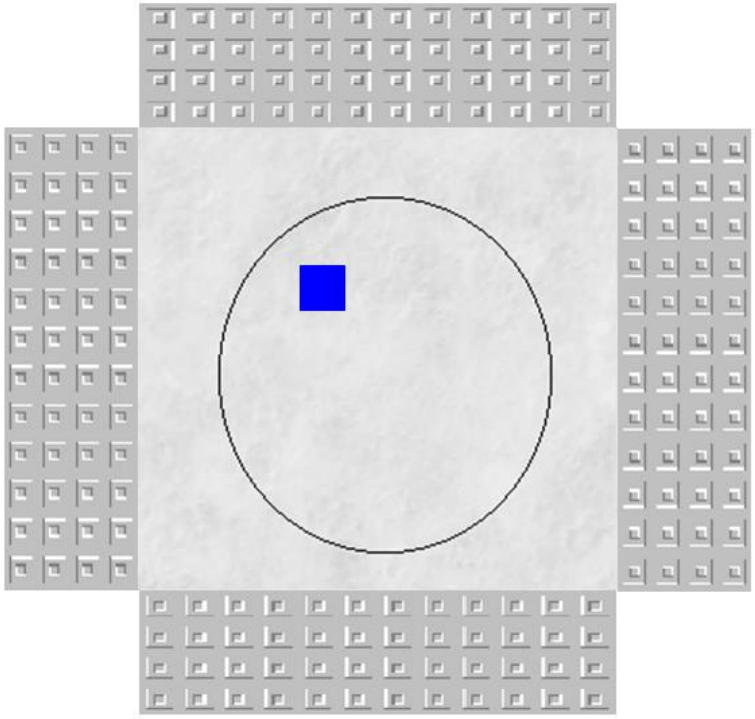


Experimental Setup

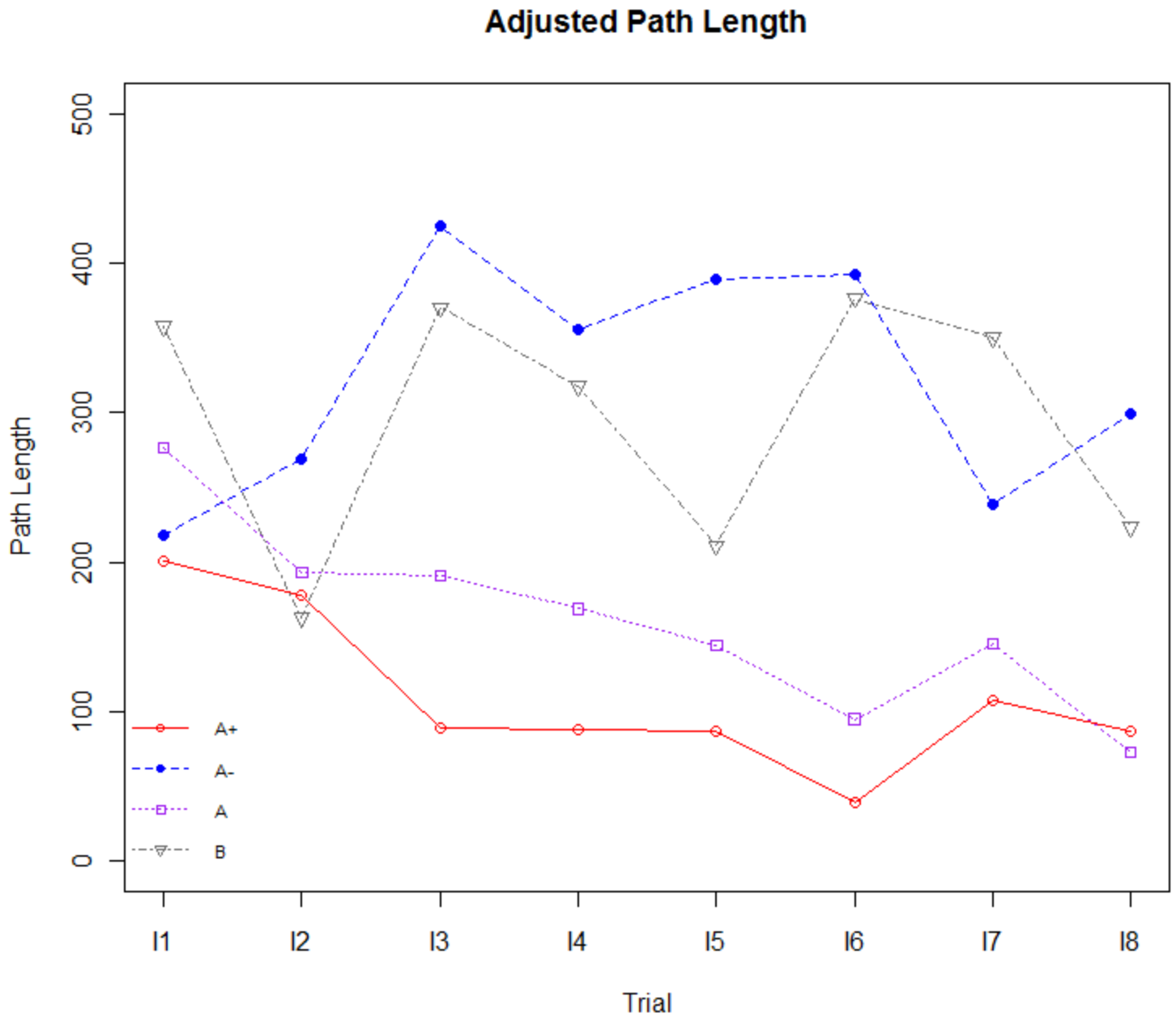


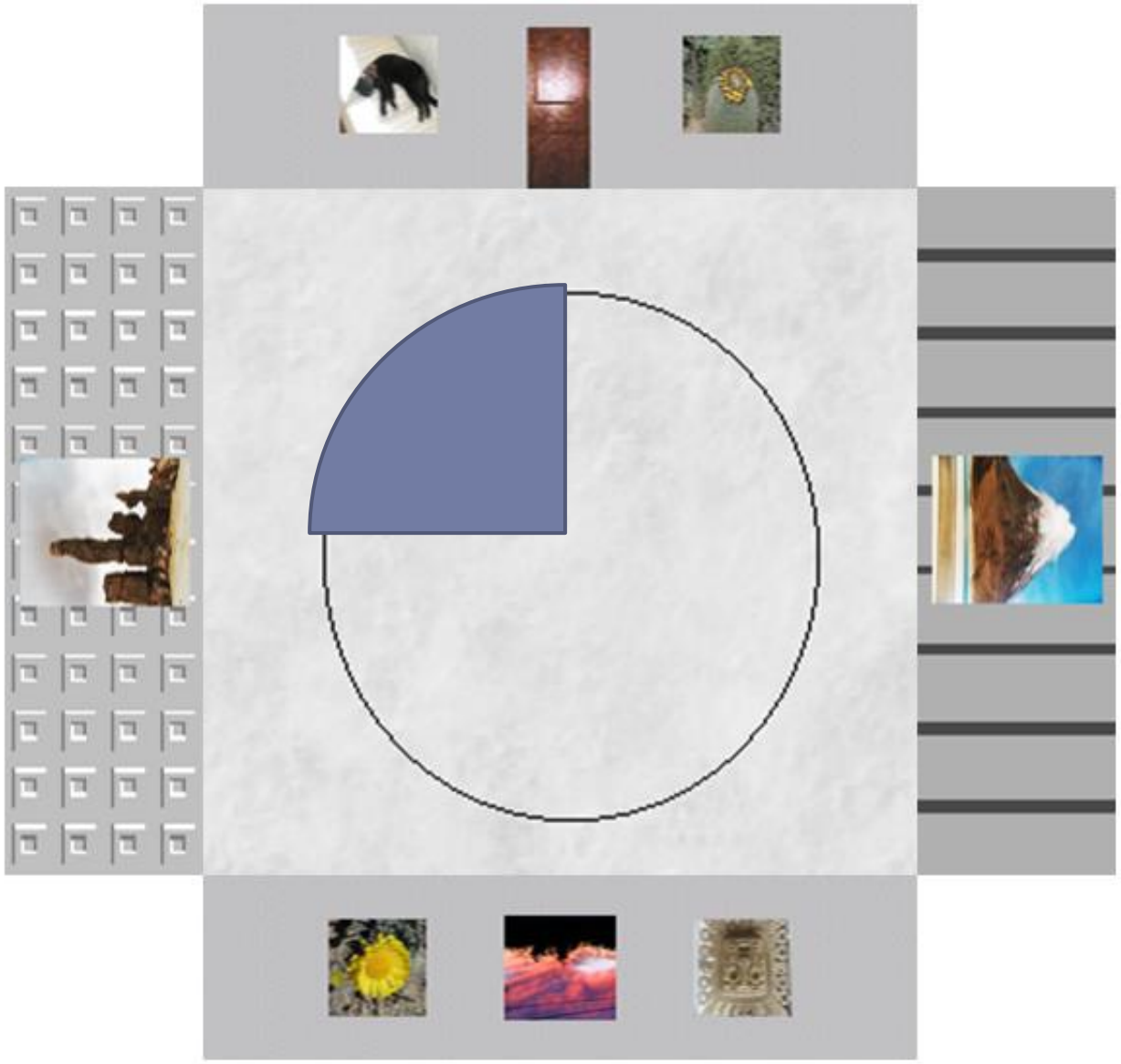
- CG-Arena with varying instructions
  - **A:** Acquisition instructions
  - **A+:** Congruent Instructions
  - **A-:** Incongruent Instructions
- Trial Order:
  - 3 visible targets
  - 8 invisible targets
  - 1probe trial
  - 1 visible target

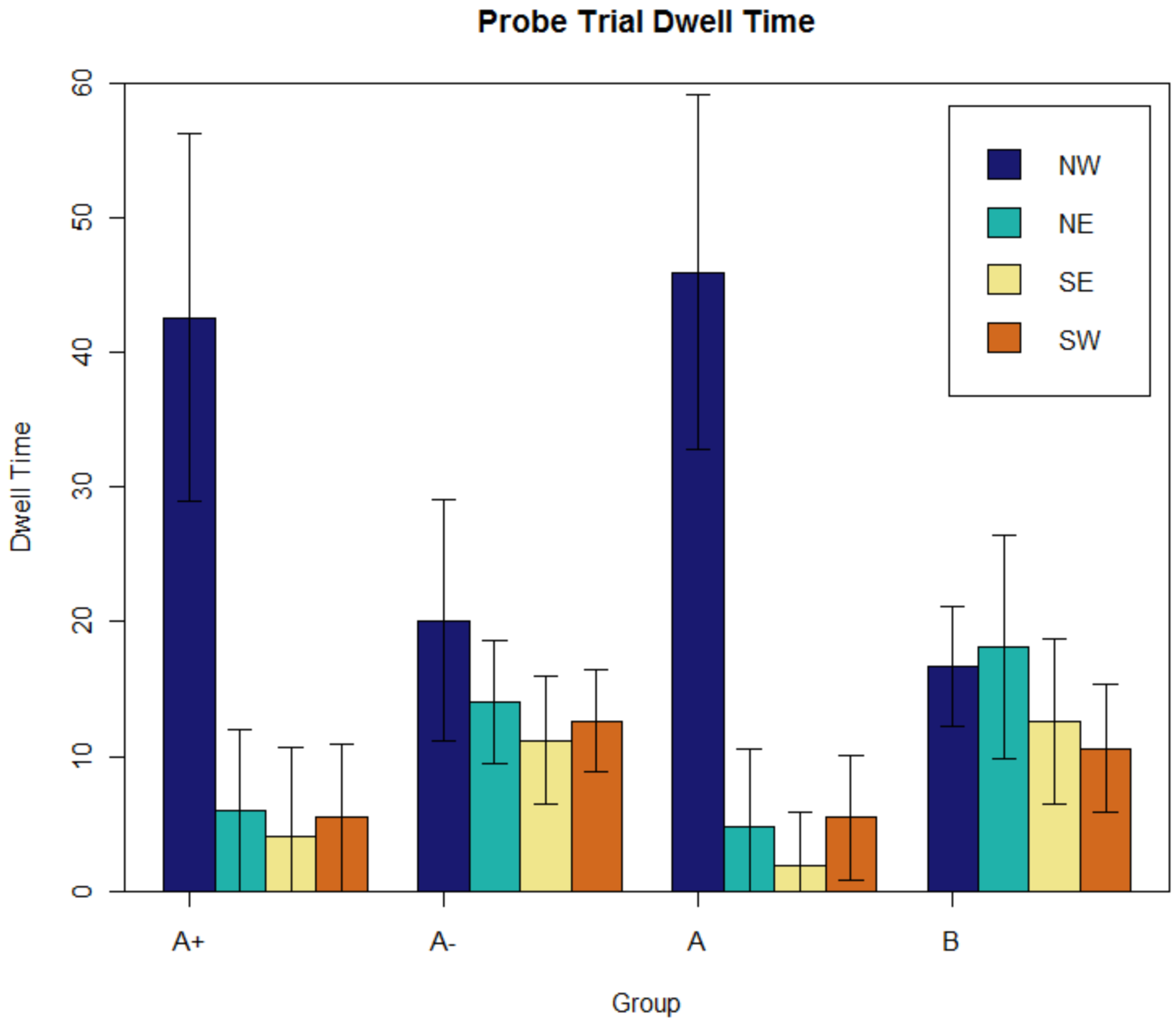
Blank Arena



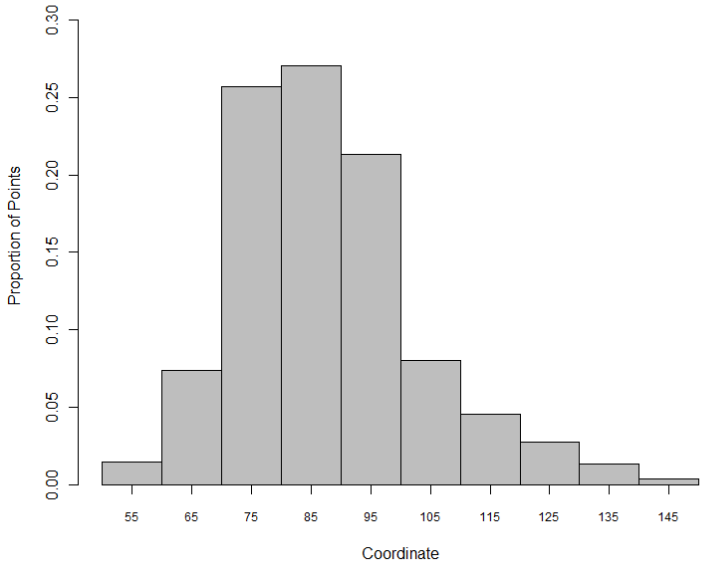
- CG-Arena
  - **B:** Acquisition instructions in a Blank Arena
- Trial Order:
  - 3 visible targets
  - 8 invisible targets
  - 1 probe trial
  - 1 visible target


Adjusted Path Length
Path Length
0
100
200
300
400
500
A+
A-
A
B
I1
I2
I3
I4
I5
I6
I7
I8
Trial

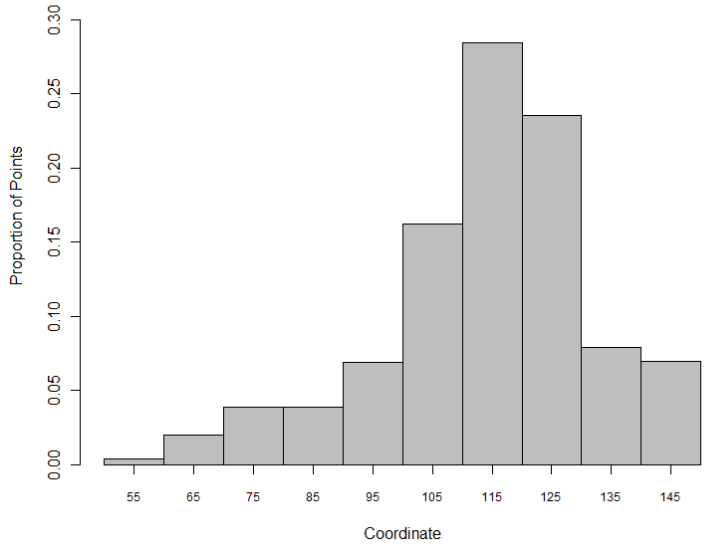


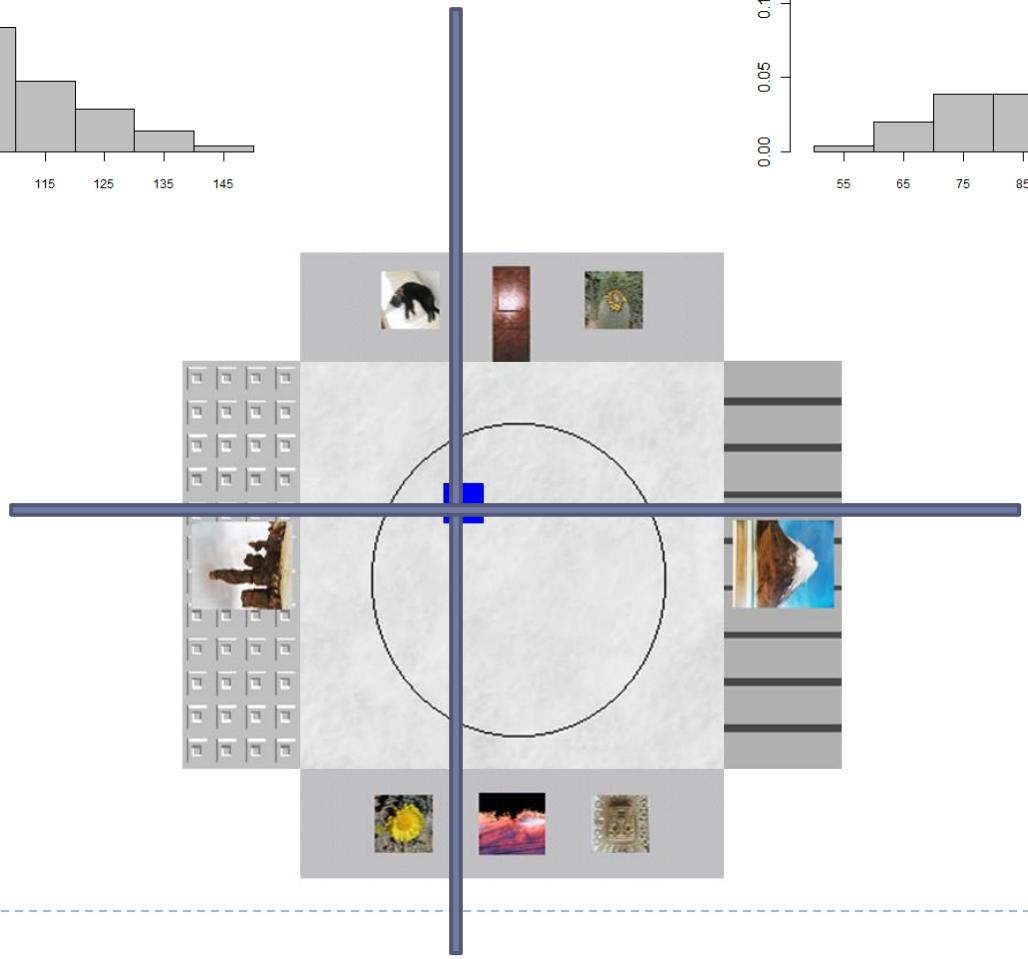

Probe Trial Dwell Time
Dwell Time
0
10
20
30
40
50
60
NW
NE
SE
SW
A+
A-
A
B
Group

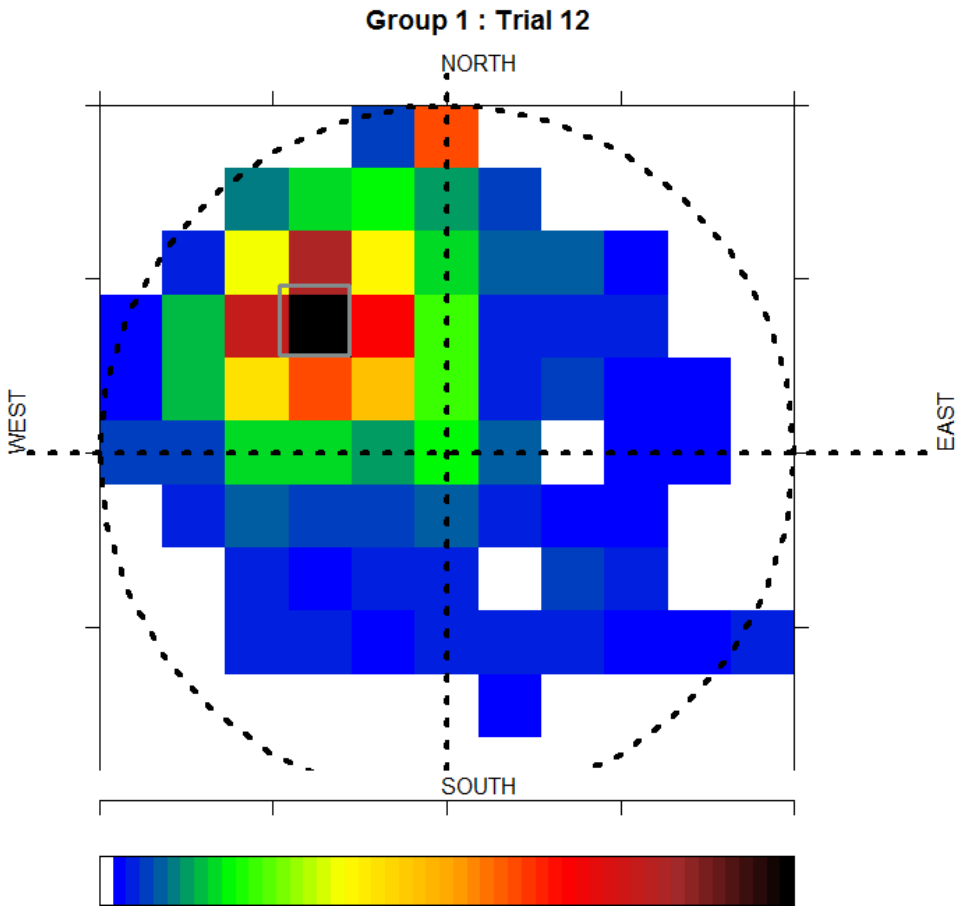
Group 1 : Trial 12 --East to West Coordinates

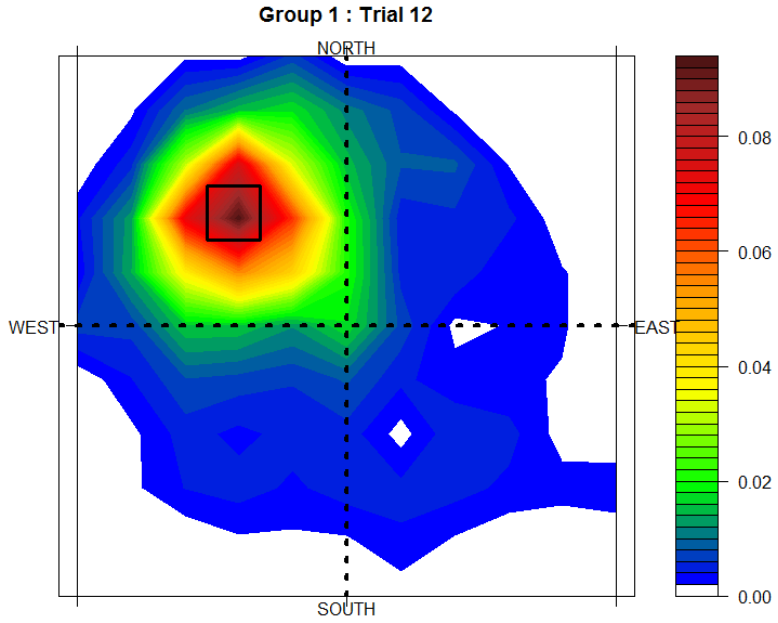


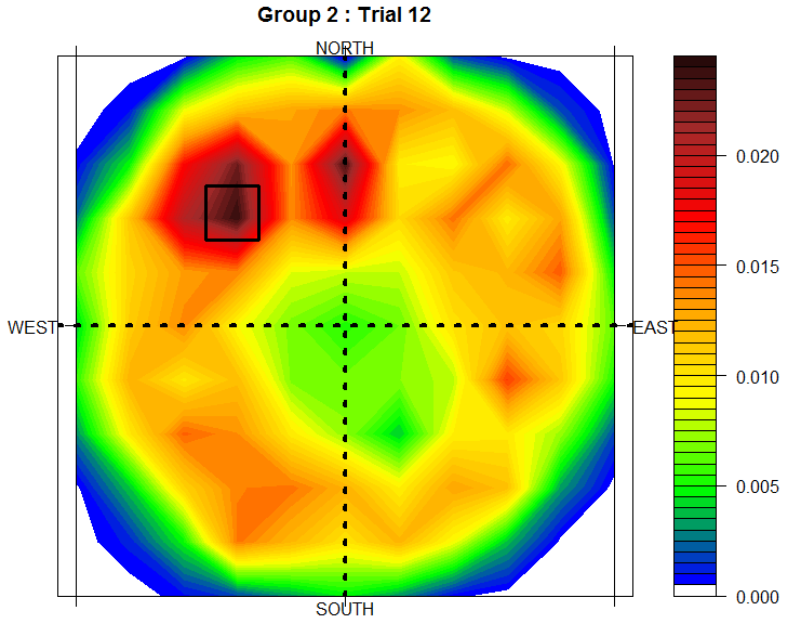
Group 1 : Trial 12 --North to South Coordinates

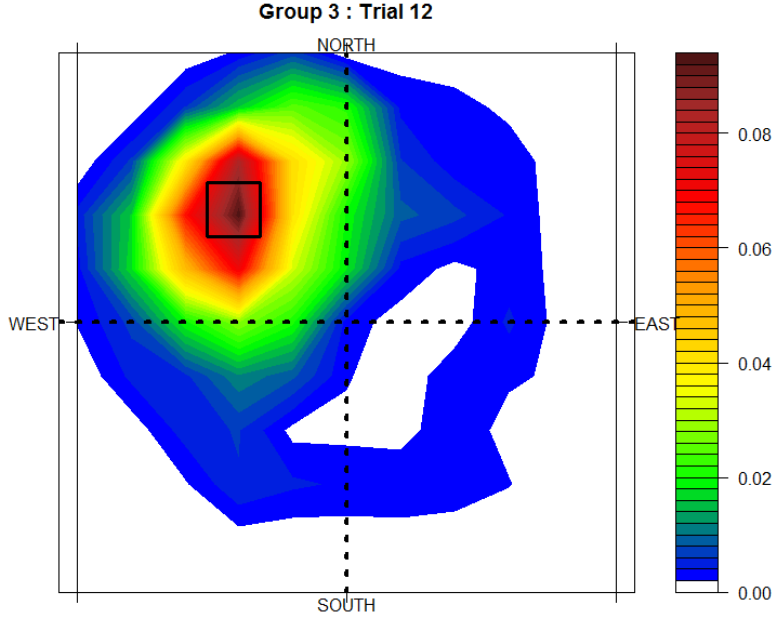


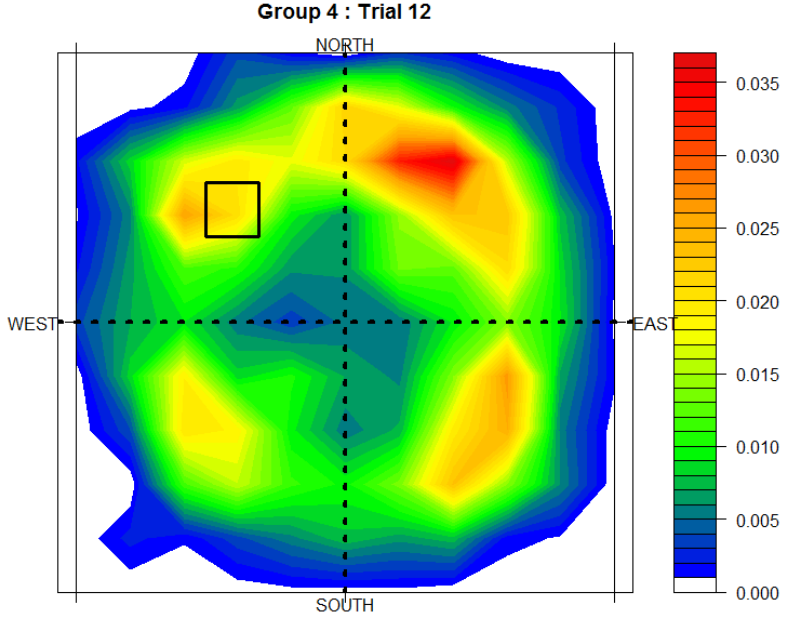



Group 1 : Trial 12
NORTH
WEST
EAST
SOUTH


Group 1 : Trial 12
NORTH
WEST
EAST
SOUTH
0.08
0.06
0.04
0.02
0.00

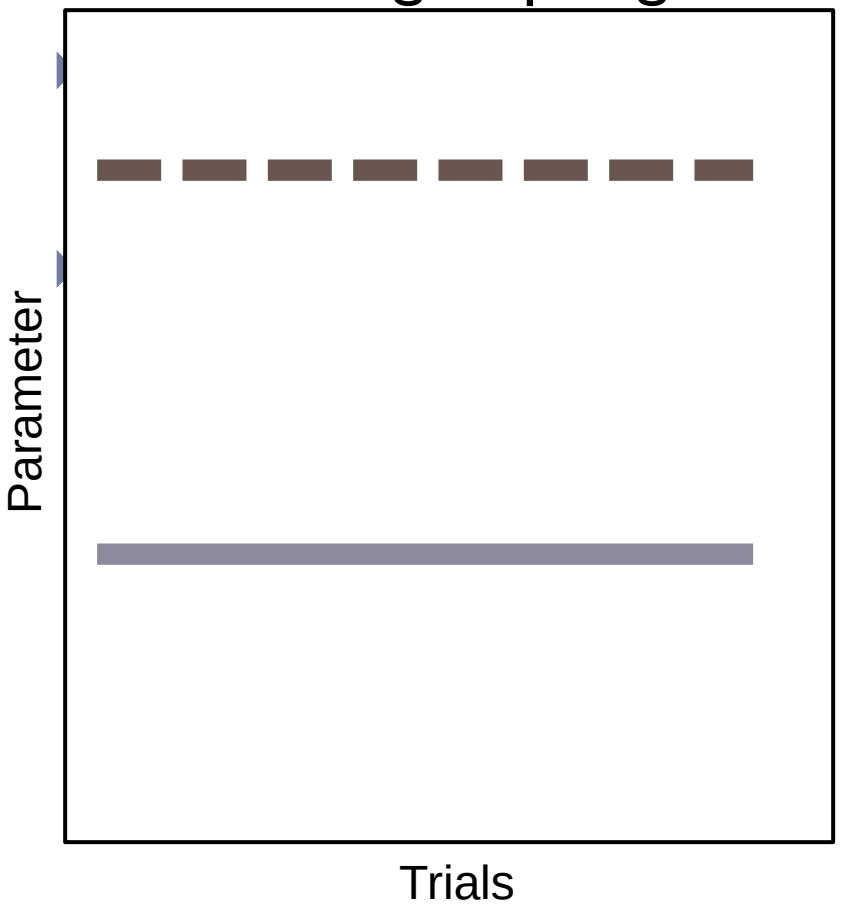

Group 2 : Trial 12
NORTH
WEST
EAST
SOUTH
0.020
0.015
0.010
0.005
0.000


Group 3 : Trial 12
NORTH
WEST
EAST
SOUTH
0.08
0.06
0.04
0.02
0.00


Group 4 : Trial 12
NORTH
WEST
EAST
SOUTH
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000

What does this exploration tell us?

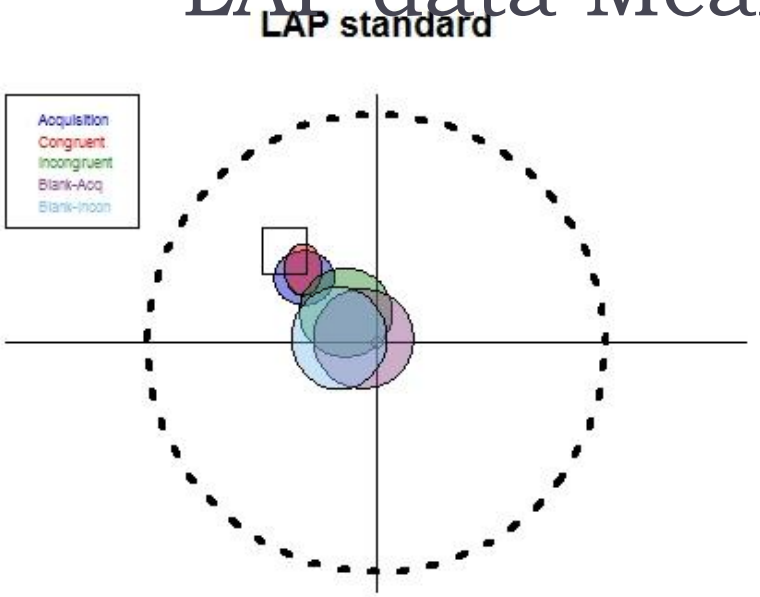
- A+ and A group together

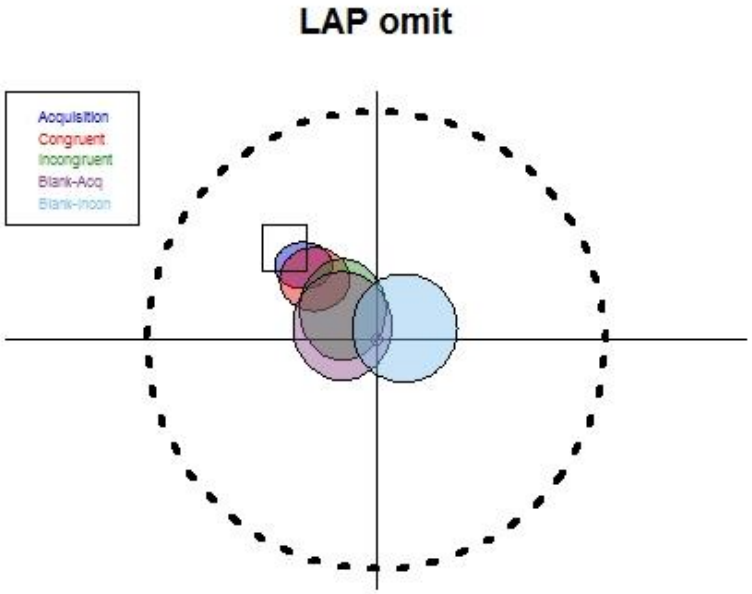


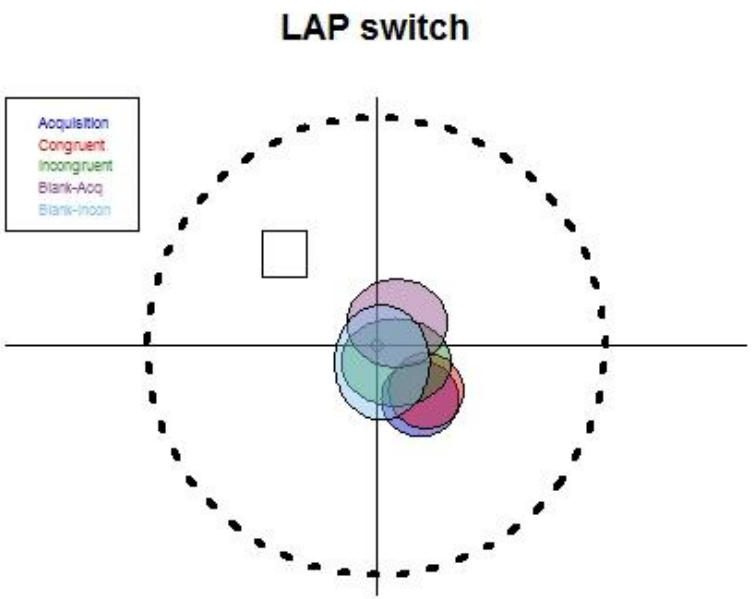
Arena Continued

Measuring Explicit Spatial Memory

LAP data Mean

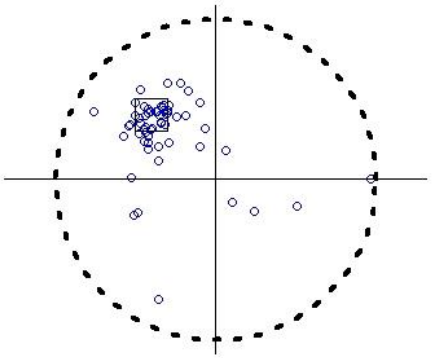




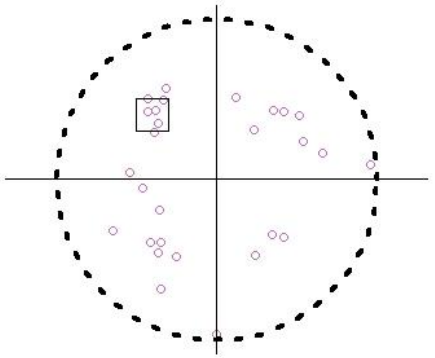


LAP data
Individual in Standard Configuration

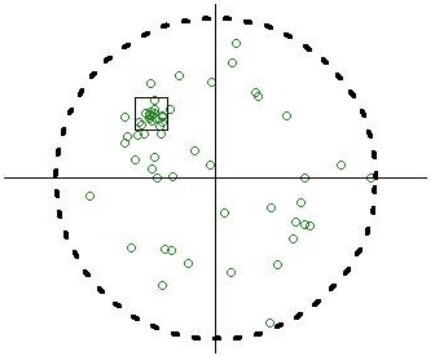
LAP standard: Acquisition



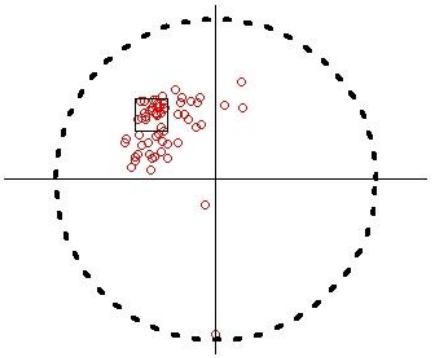
LAP standard: Blank-Acqu



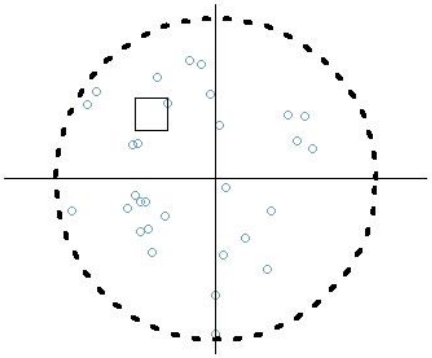
LAP standard: Incongruent



LAP standard: Congruent

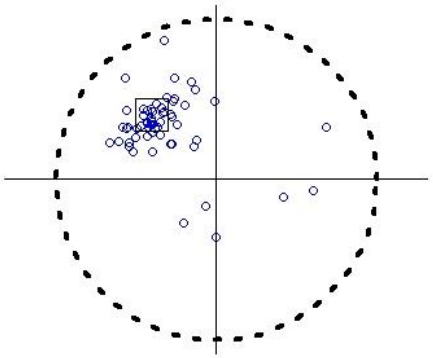


LAP standard: Blank-Incon

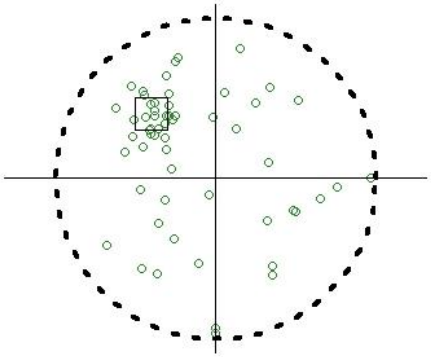


LAP data
Individual in Omit Configuration

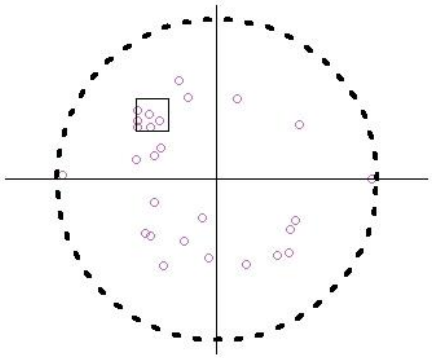
LAP omit: Acquisition



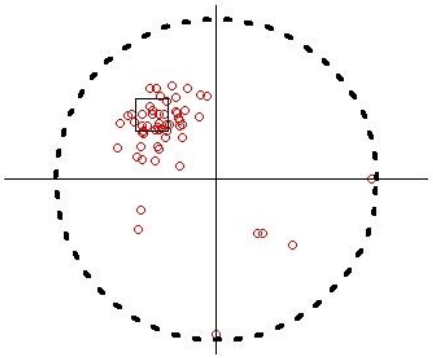
LAP omit: Incongruent



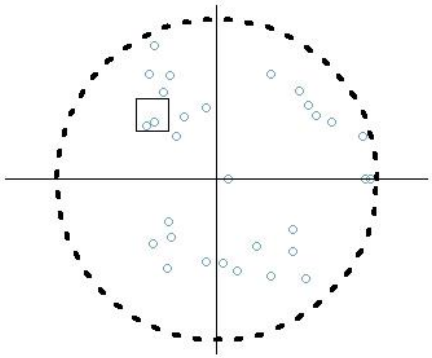
LAP omit: Blank-Acqu



LAP omit: Congruent

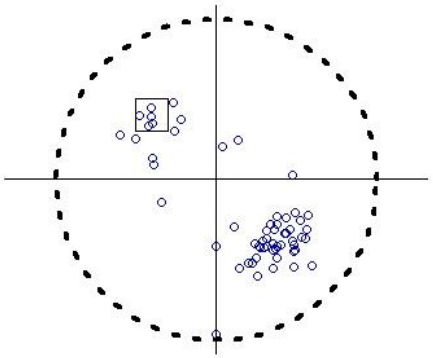


LAP omit: Blank-Incon

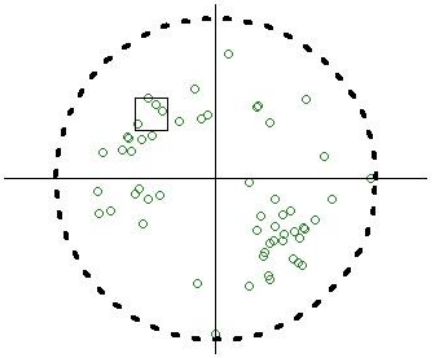


LAP data
Individual in Switch Configuration

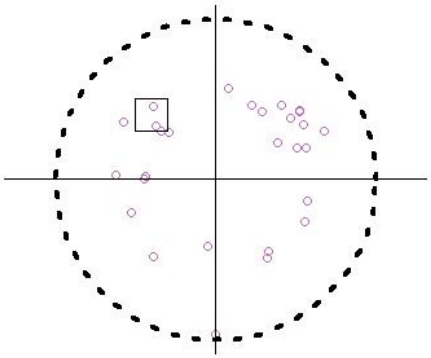
LAP switch: Acquisition



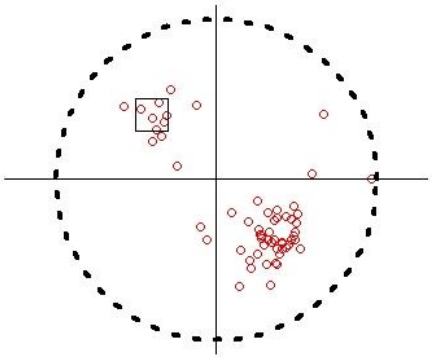
LAP switch: Incongruent



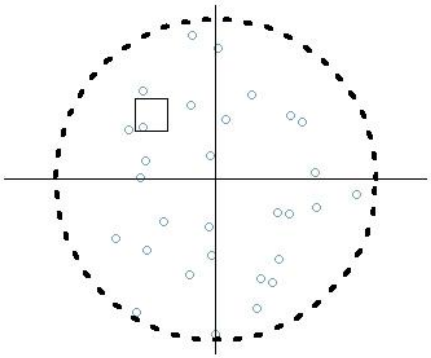
LAP switch: Blank-Acqu



LAP switch: Congruent



LAP switch: Blank-Incon



Some helpful links

- R main page:
  - http://www.r-project.org/index.html
- Common R graphics packages
  - http://cran.r-project.org/web/packages/gplots/gplots.pdf
  - http://cran.r-project.org/web/packages/ggplot2/ggplot2.pdf
    - http://docs.ggplot2.org/current/
    - http://link.springer.com.ezproxy1.library.arizona.edu/book/10.1007/978-0-387-98141-3 (requires NetID login)
  - http://cran.r-project.org/web/packages/psych/psych.pdf
- R help:
  - http://www.r-tutor.com/r-introduction
  - http://rwiki.sciviews.org/doku.php
  - http://cran.r-project.org/manuals.html
- R graphics examples and code
  - http://it-ebooks.info/book/1316/

For 04/23/2014

- Download the latest version of R
- Download R-studio
- Install packages:
  - Psych
  - Ggplot2
  - Gplots
  - Rcmdr

- We'll have "some fun" with some hands on activities!