Personality and association patterns among individuals: two metrics for analyzing the innovation and spread of novel traits in a captive group of common starlings (*Sturnus vulgaris*)

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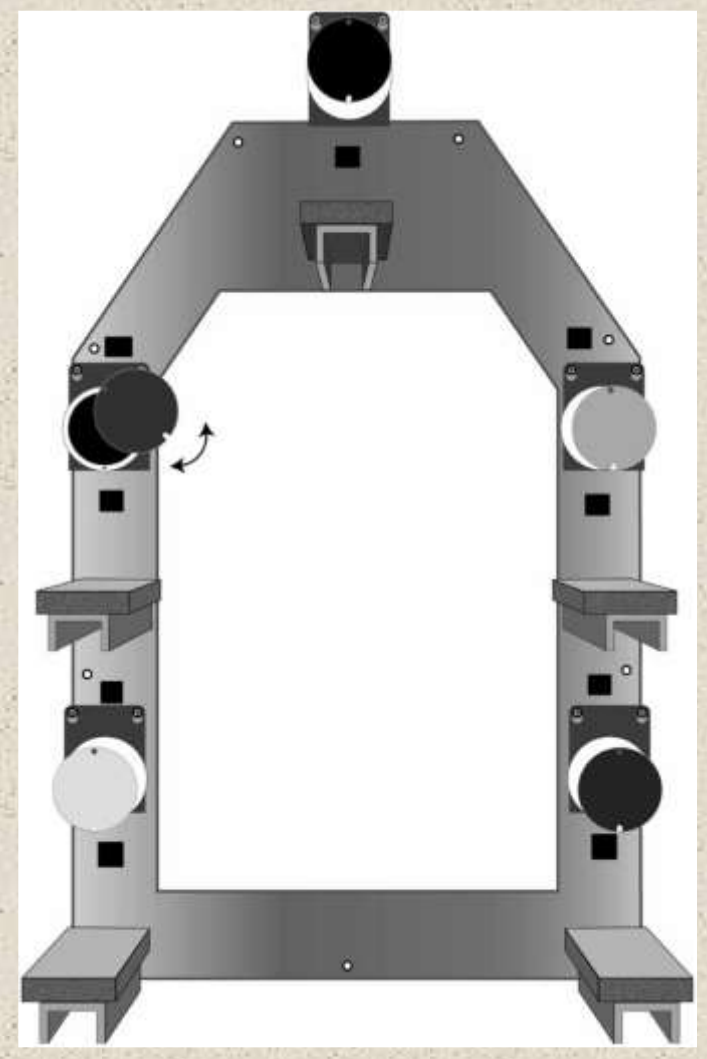
Personality

Shy ⟷ Bold

Wilson (1998)
Michelena et al. (2008)

Novel Problem Solving



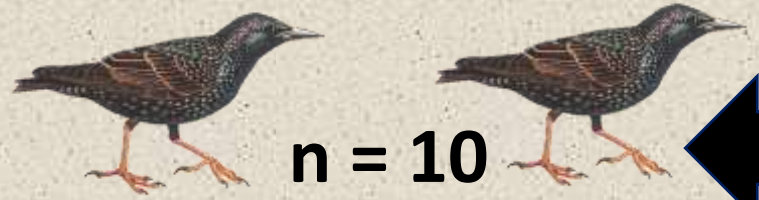
Moscovice & Snowdon (2006)

Novel Experiments

Novel Foraging

Novel Environment

Group 1

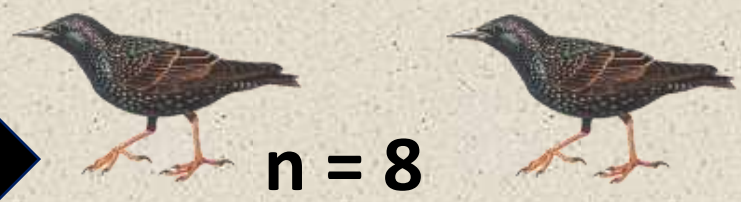


n = 10

♂ = 7 ♀ = 3

Juv. = 9 Adu. = 1

Group 4



n = 8

♂ = 6 ♀ = 2

Juv. = 4 Adu. = 4

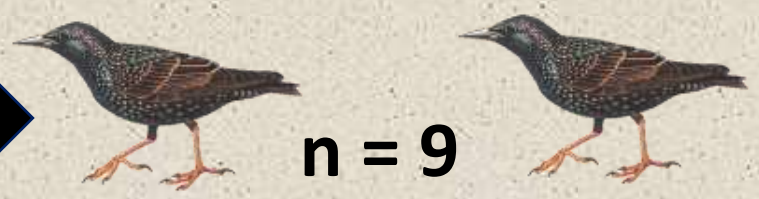
Group 2

n = 9

♂ = 7 ♀ = 2

Juv. = 5 Adu. = 4

Group 3



n = 9

♂ = 6 ♀ = 3

Juv. = 5 Adu. = 4

Questions of Interest

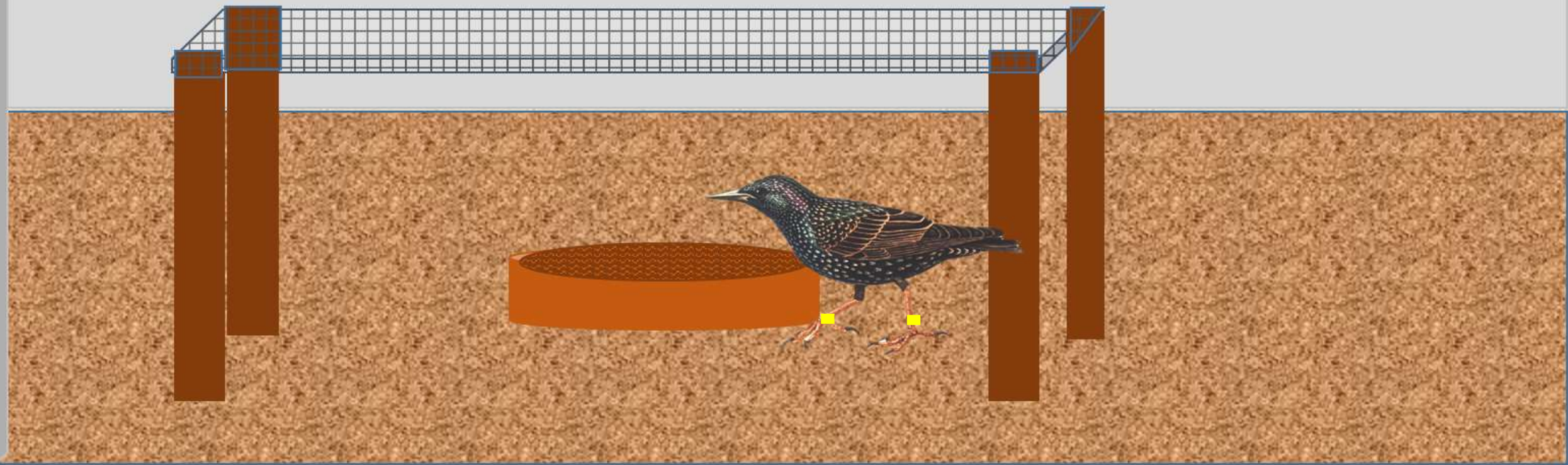
- Do starlings differ in their personality traits, such as in boldness?
  - If there is a difference in personality traits between starlings then bold individuals will enter a novel area more frequently than shy individuals.

Questions of Interest

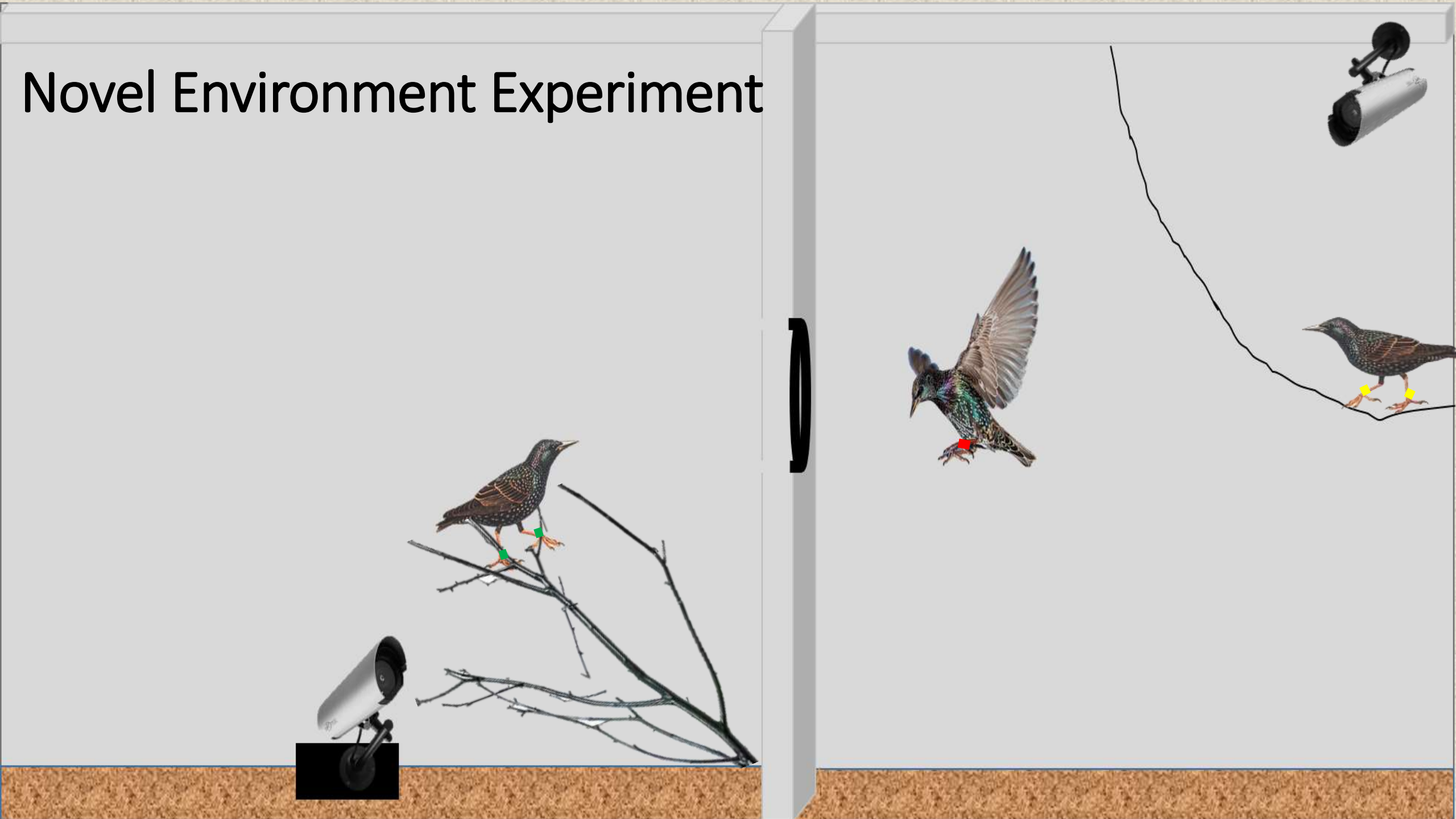
- Is there a positive correlation between problem solving ability and boldness?
  - Individuals that are first to solve a novel foraging task will also be the first to enter a novel environment.

Novel Foraging Experiment

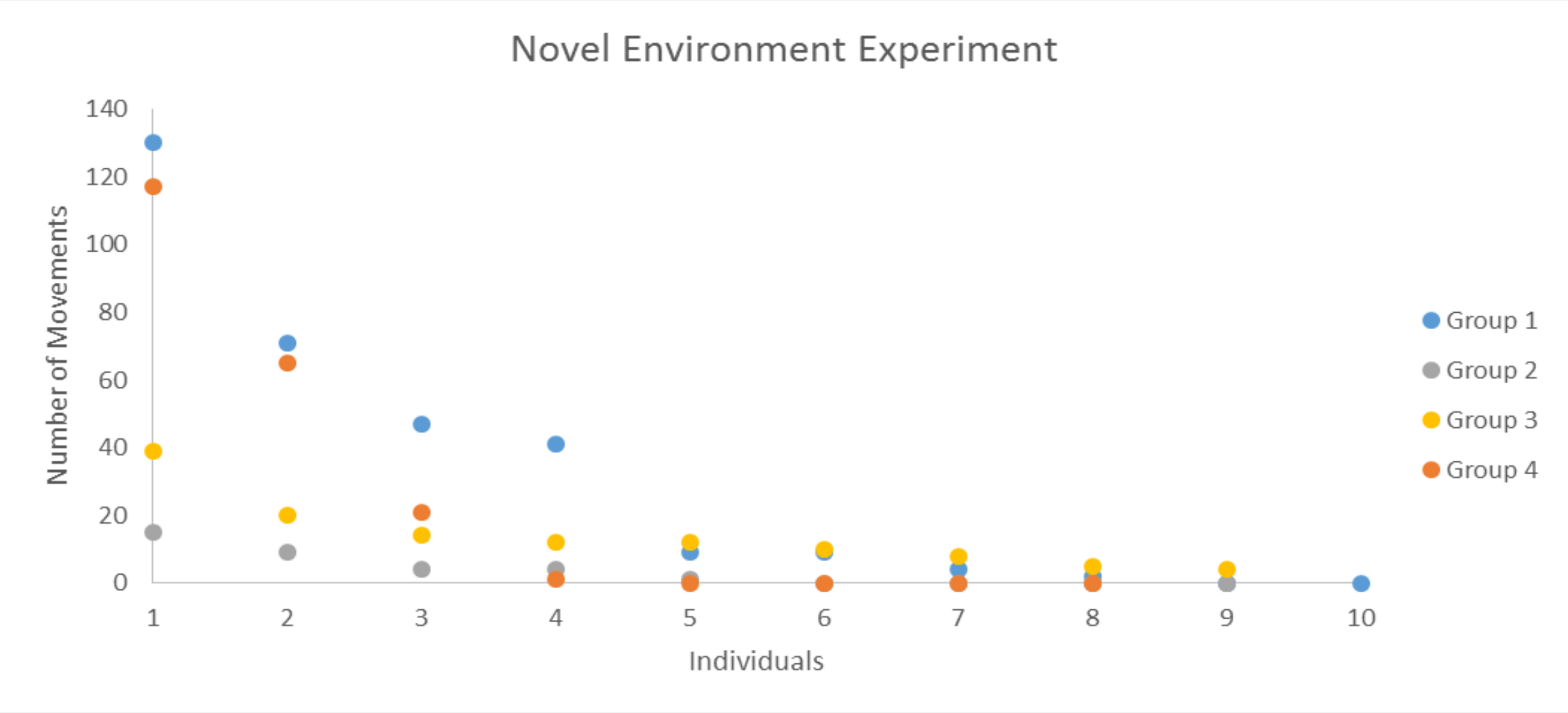
Novel Foraging Experiment



Novel Environment Experiment



Do starlings differ in their personality traits?



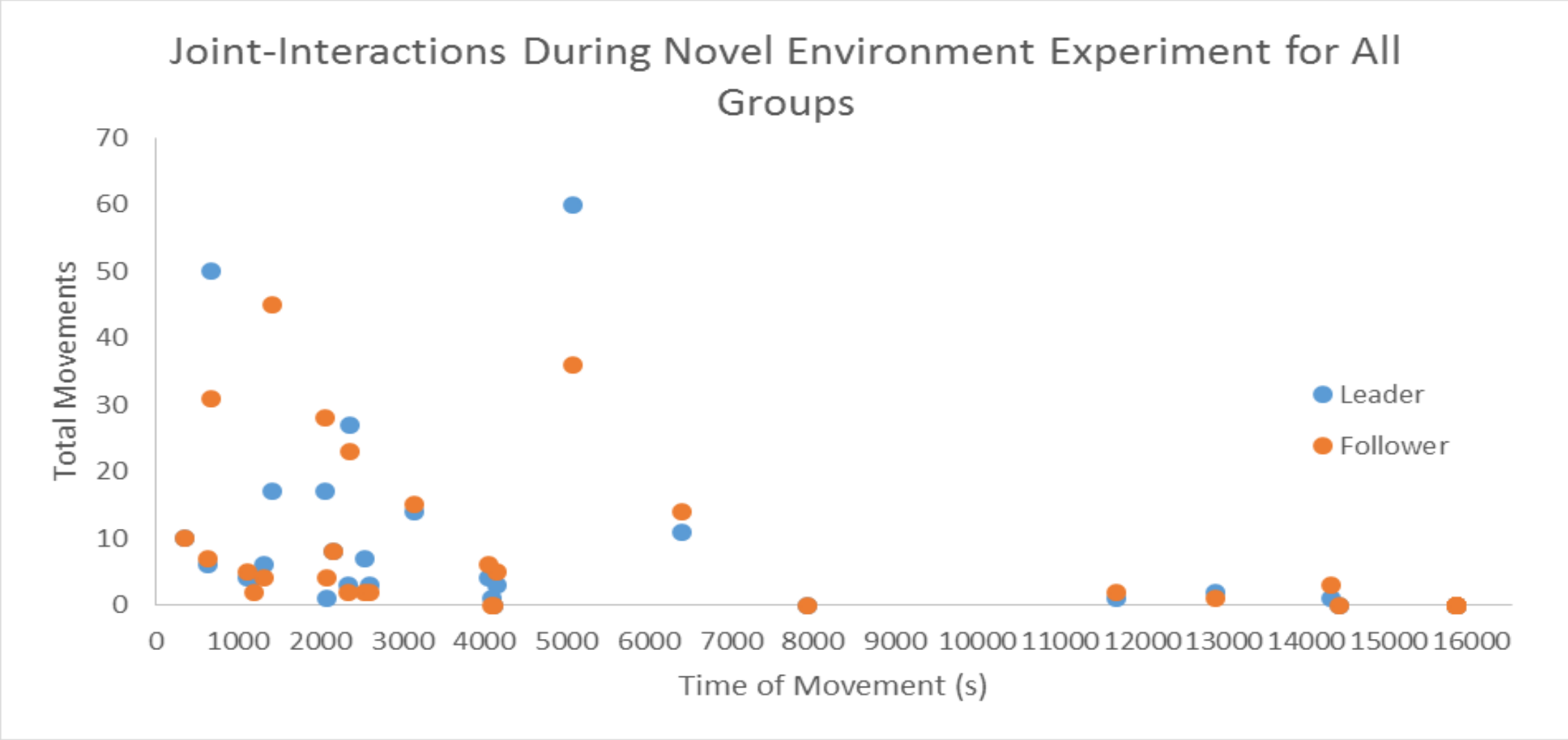
$\bar{x}$ = 18.72 movements P-value = < 0.005 α = 0.05

Novel Environment Experiment

Leader

Follower

Novel Environment Experiment



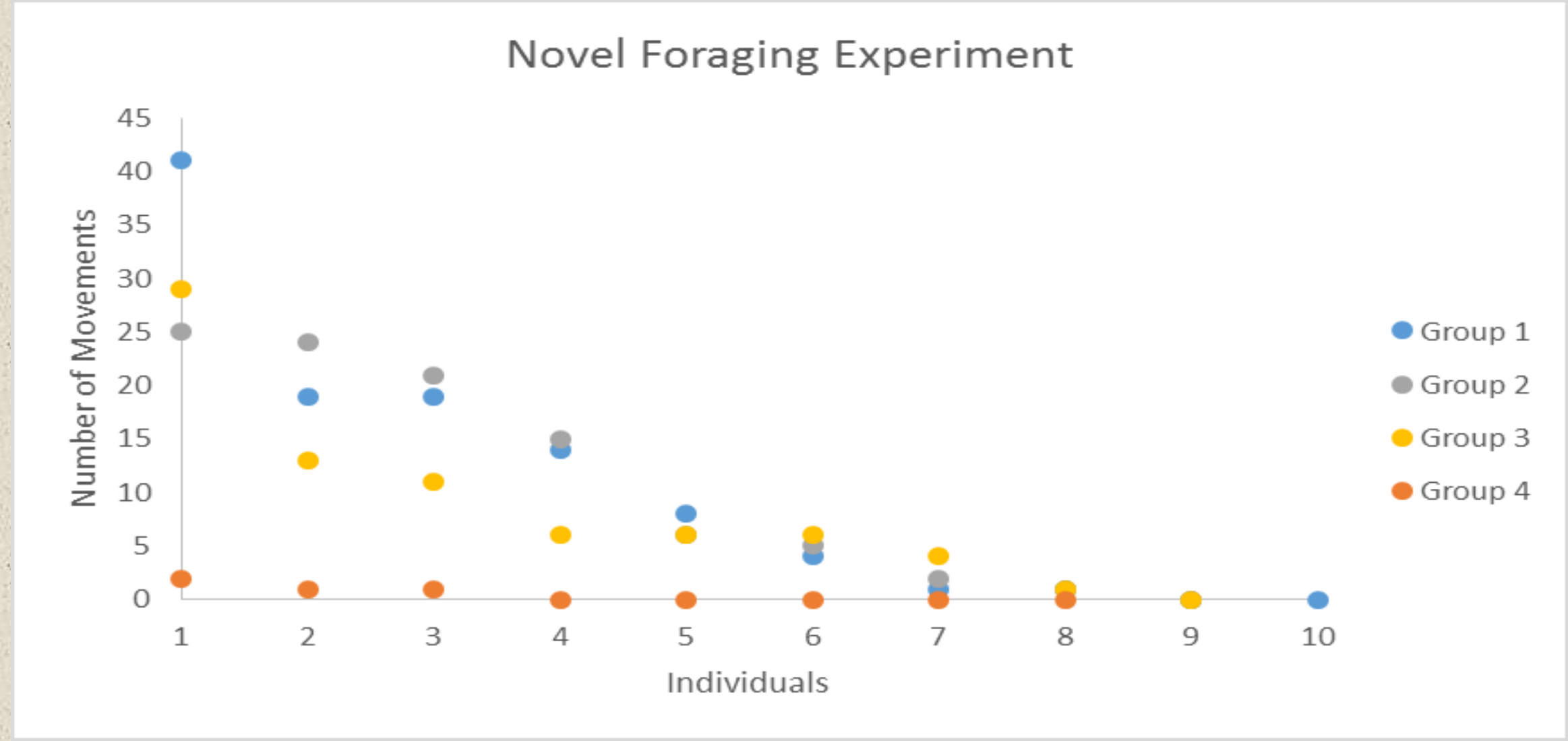
P-value = < 0.005

α = 0.05

Novel Environment Experiment

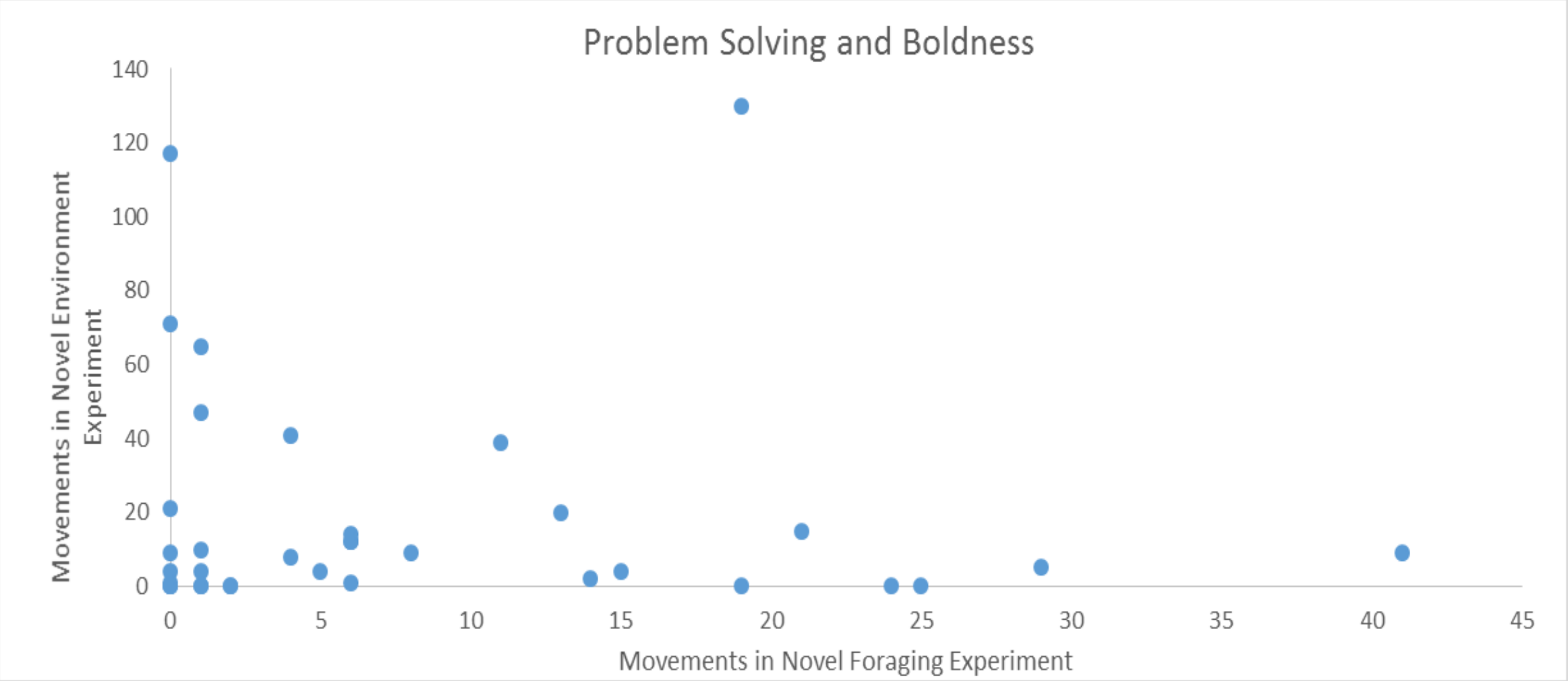
	Follower							
Leader	DkB/GY	Y/BK	R/LtG	W/Y	GY/R	W/BK	DkG/DkB	LtG/O
R/R	5	17	7	-	-	-	-	-
P/P	1	6	1	-	-	-	-	-
DkB/DkB	6	9	-	-	-	-	-	-
O/O	1	-	1	-	-	-	-	-
Y/Y	-	1	-	-	-	-	-	-
LtG/B	-	-	1	-	-	-	-	-
DkG/DkG	-	-	-	-	-	-	-	-
W/W	-	-	-	-	-	-	-	-
LtB/O	-	-	-	-	-	-	-	-
O/Y	-	-	-	-	-	-	-	-

Do starlings differ in their personality traits?



$\bar{x}$ = 8.72 movements P-value = < 0.005 α = 0.05

Is there a positive correlation between problem solving ability and boldness?



P-value = 0.744 $\alpha = 0.05$

Social Networks & Network-Based Diffusion Analysis

- Future implications
- NBDA evaluates the trajectory of a trait among individuals by comparing the social networks of the group to the pattern of trait acquisition by individuals.

Social Learning

- Directed social learning

Other implication:
-Spread of disease

Social Transmission

Acknowledgements

- Wyoming EPSCoR
- Dr. Sarah Benson-Amram
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