



Does the quality of food affect the personality and cognitive abilities of mice?

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Let's start with
the basics



Cognitive flexibility



Personality



Food quality



Cognitive flexibility

- Flexibility is very energy-consuming

- Animals need behavioral and cognitive flexibility to quickly show appropriate changes in behavior in response to changes in their environment

Cognitive flexibility = differences in ability to learn and remember

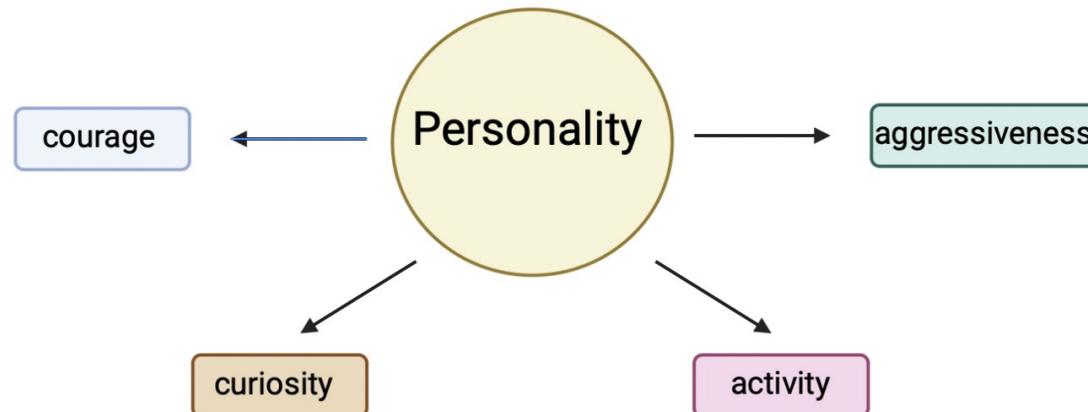
More flexible individuals will perform better while individuals with less flexibility will be persistent and make more mistakes



Personality

- Cognitive abilities and information processing are often associated with differences in personality

- Individuals with higher levels of cognitive development may display more complex and/or demanding traits
- Personality refers to differences in behavior that remain stable and correlated with each other regardless of time and context





Food quality

- Driving force for changing behavior is the availability and quality of food



- Bolder
- More interest in exploring
- Less flexible



- Shy
- Less interest in exploring
- More flexible

Mus musculus domesticus

Standard-quality (SQ) food
in 5th generation



n=21

High-quality (HQ) food
in 5th generation



n=18

What do we expect?



SQ diet

Bold

Would show less cognitive flexibility

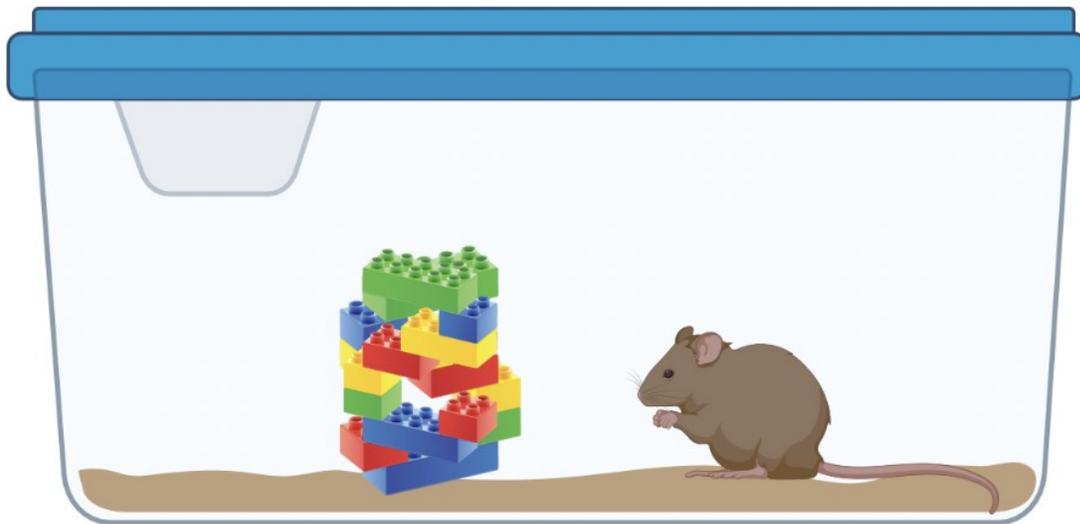


HQ diet

Shy

Would show more cognitive flexibility

Novel object



- Latency
- Number
- Time spent with object
- Repeatability

Object was reintroduced again after 3 weeks

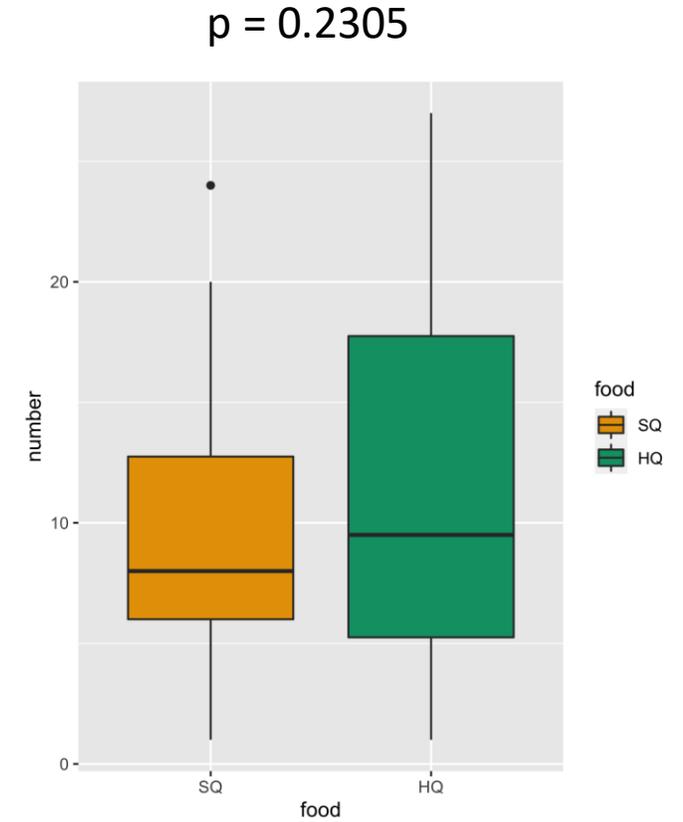
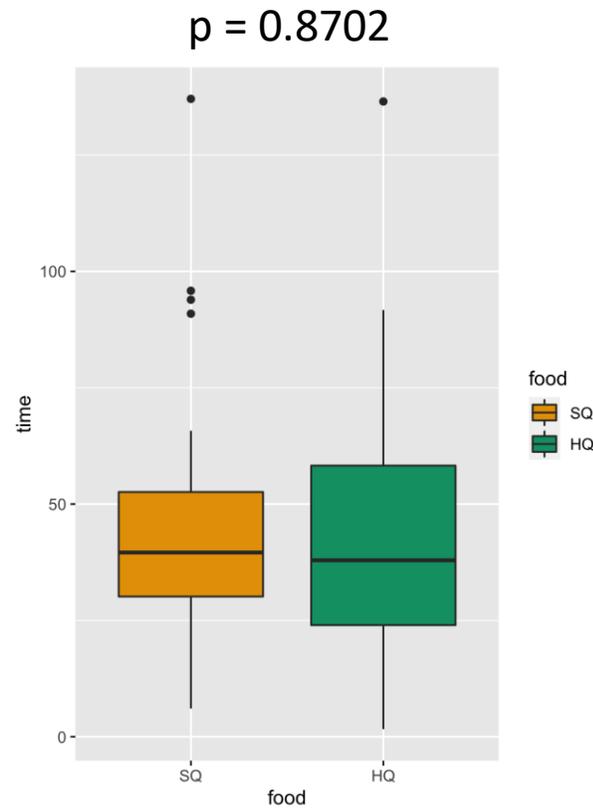
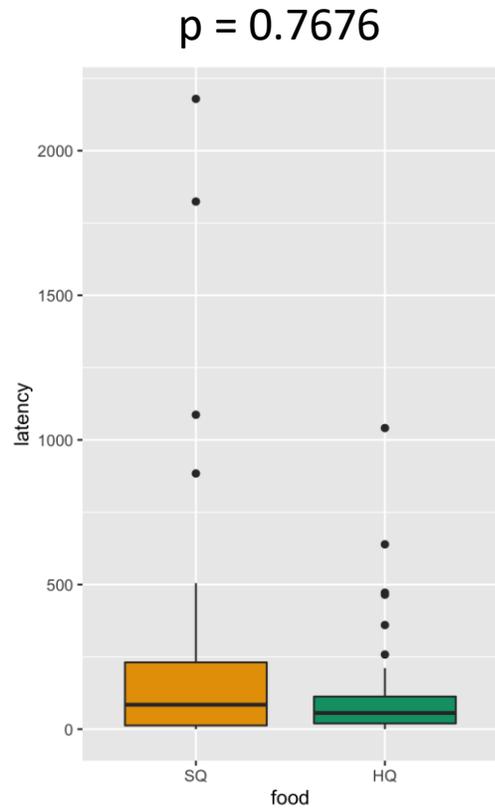
Problem solving



- Latency to interact
- Number of interaction
- Time of interaction

Results

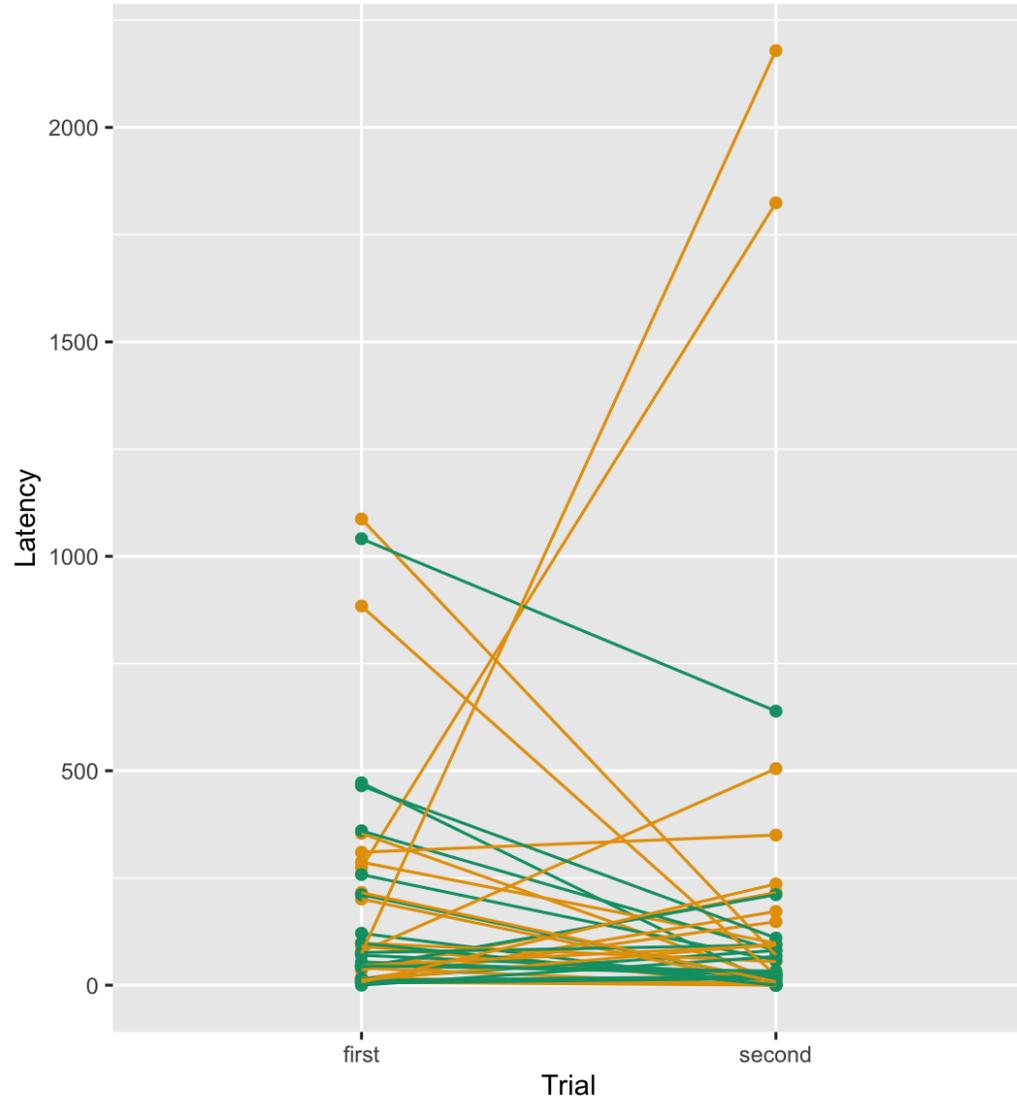
Novel object



No diet effect

Results

Novel object

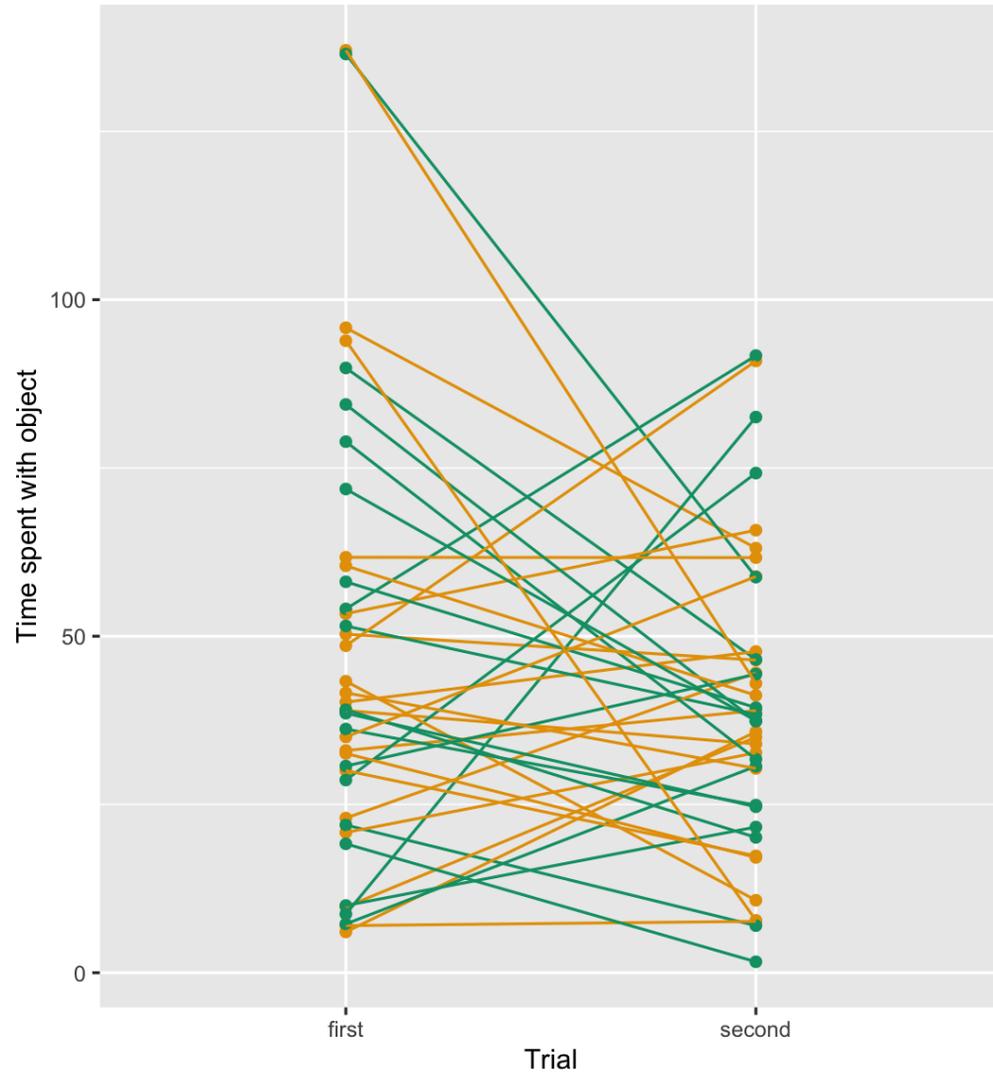


	SQ	HQ
R	0	0.572
P [LRT]	1	0.00522

No repeatability in SQ, not significant
Repeatability in HQ

Results

Novel object

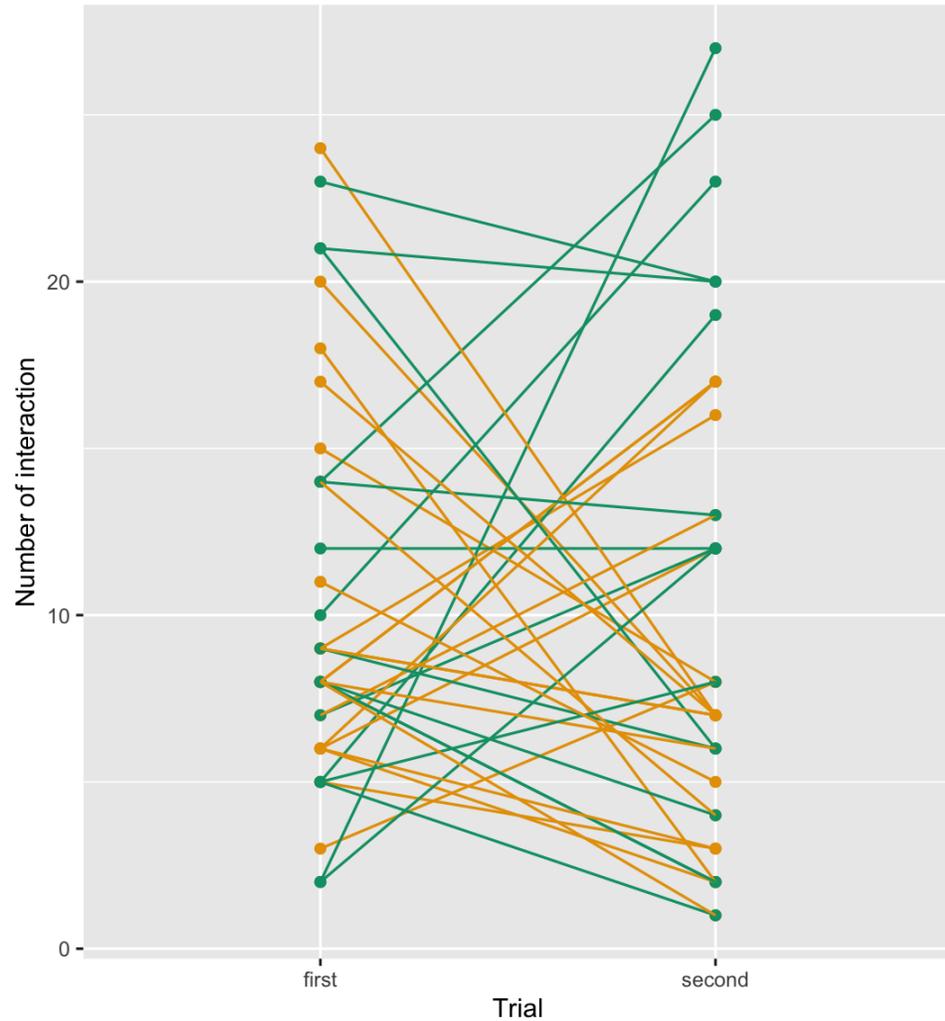


	SQ	HQ
R	0.205	0.201
P [LRT]	0.201	0.229

No difference in both diet, not significant

Results

Novel object

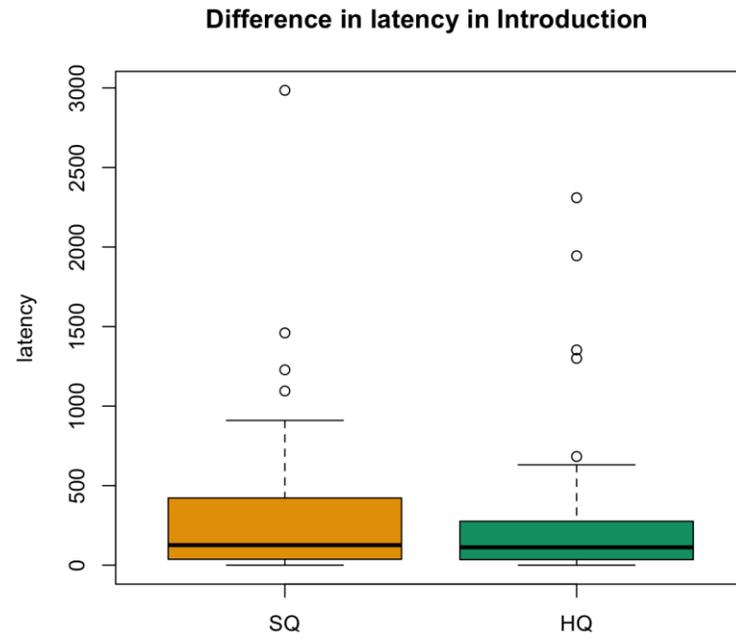


	SQ	HQ
R	0	0.119
P [LRT]	1	0.293

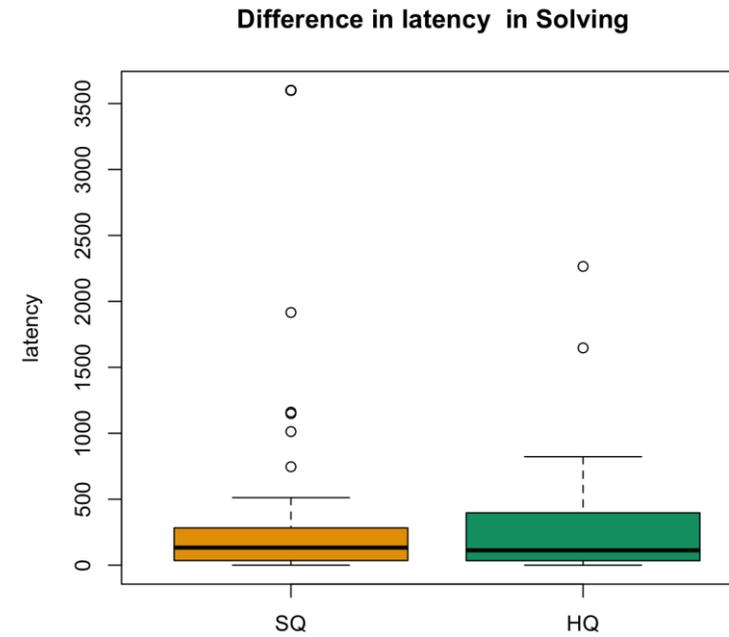
No repeatability in SQ
Some repeatability in HQ
Both not significant

Results

Problem solving



Treatment: 1-SQ, 2-HQ



Treatment: 1-SQ, 2-HQ

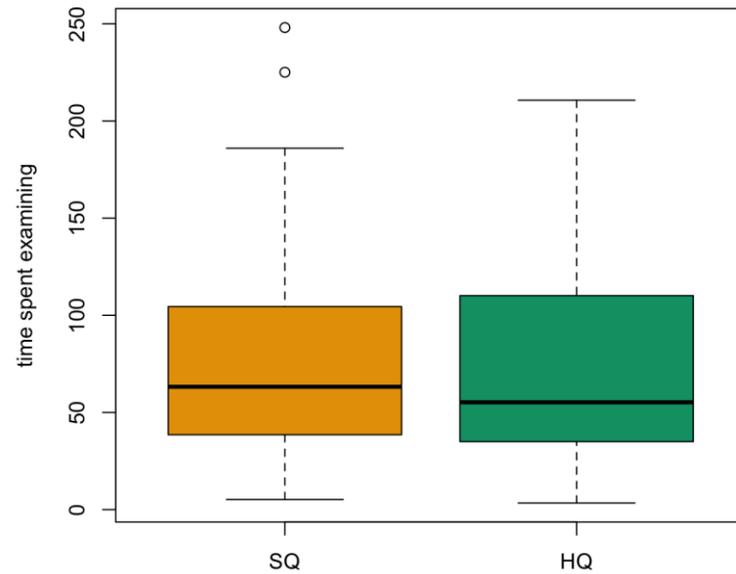


Results

Problem solving



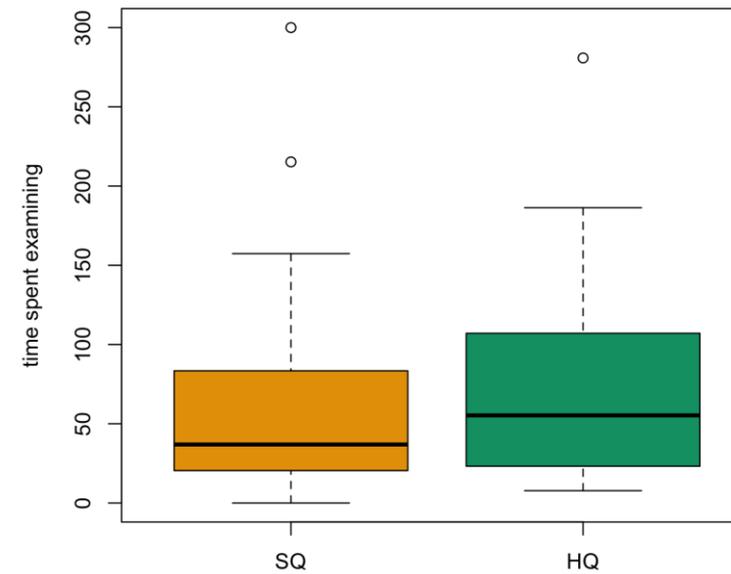
Difference in time spent examining an object in Introduction



Treatment: 1-SQ, 2-HQ



Difference in time spent examining an object in Solving



Treatment: 1-SQ, 2-HQ

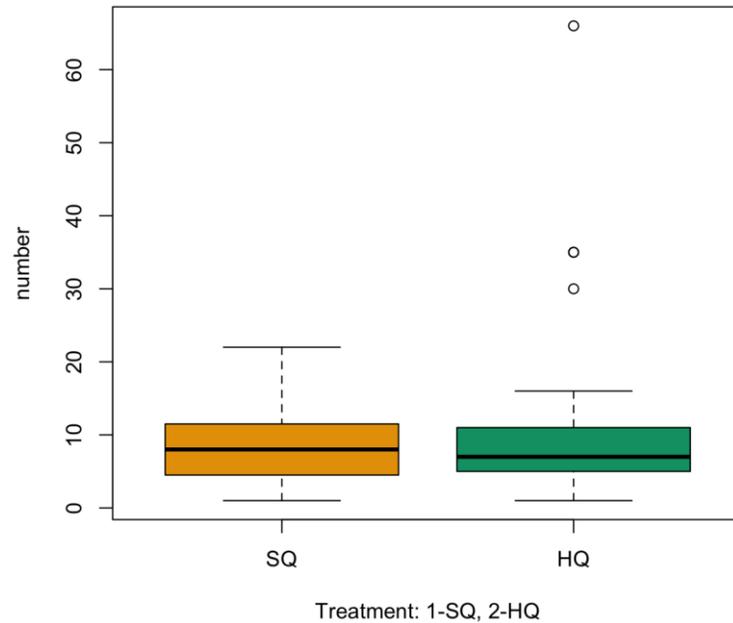


Results

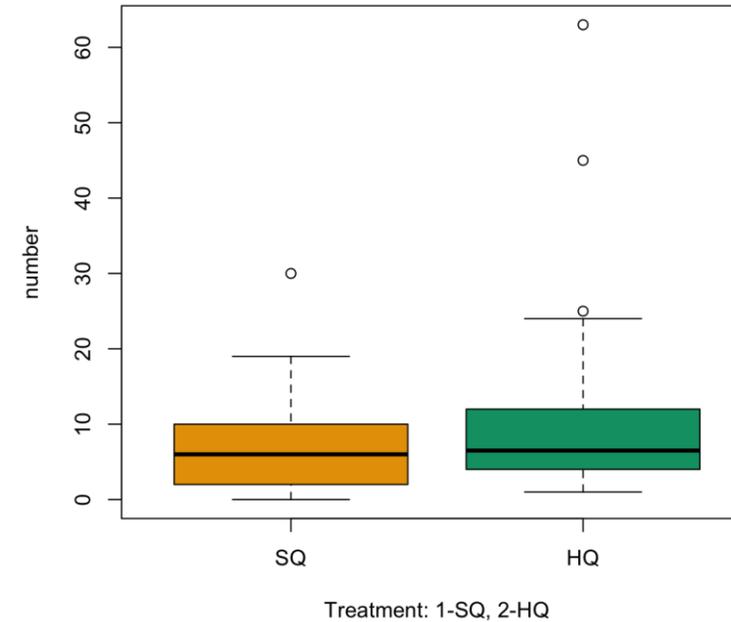
Problem solving



Difference in numbers of examinations in Introduction

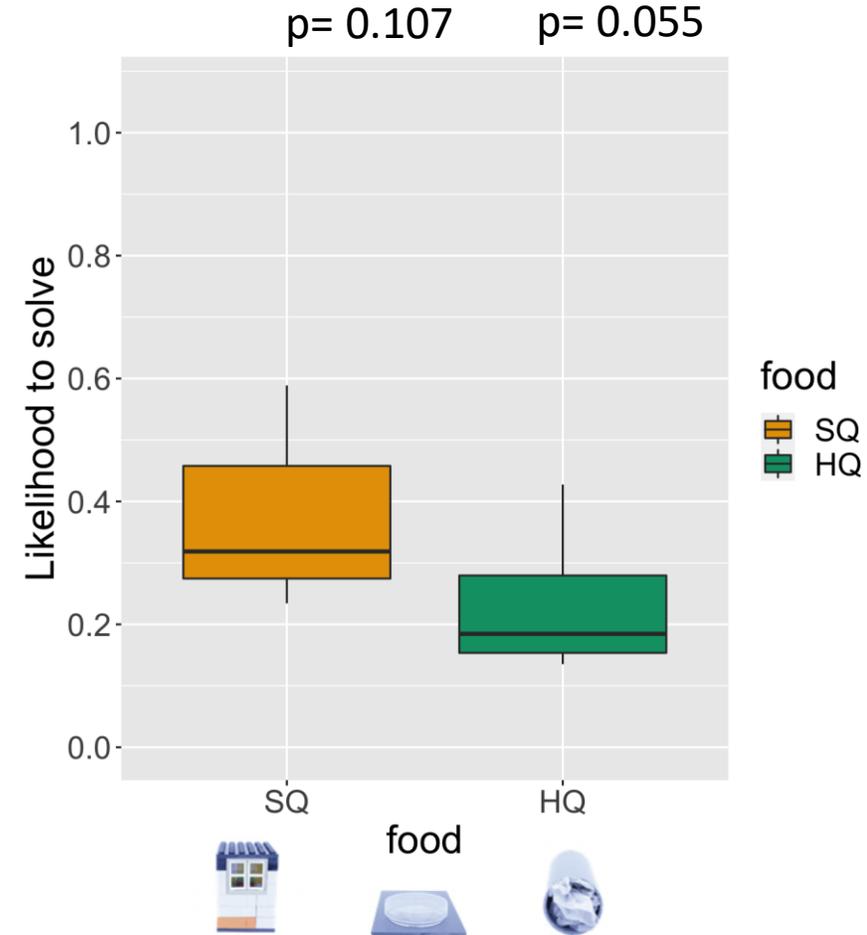
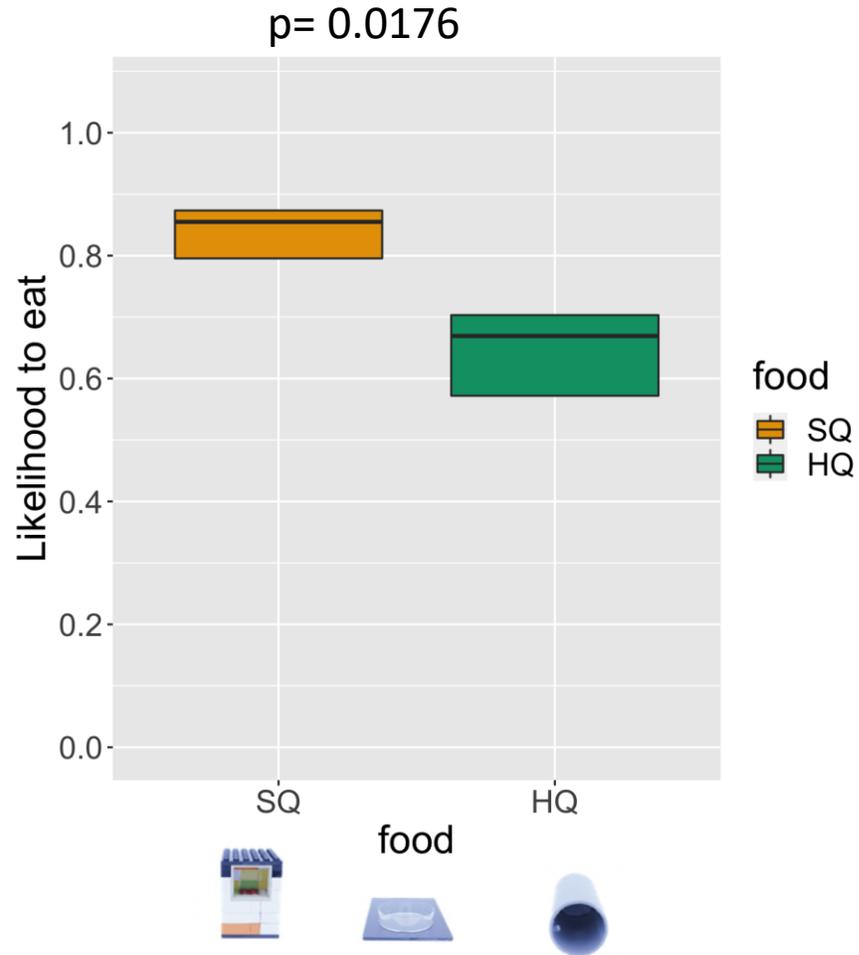


Difference in numbers of examinations in Solving



Results

Problem solving



Mice on SQ diet show more cognitive flexibility than those on HQ

What do we expect?



SQ diet

- Bold
- Would show less cognitive flexibility



HQ diet

- Shy
- Would show more cognitive flexibility

What did we get



SQ diet



Same behavior



More cognitively flexible



HQ diet



Same behavior



Less cognitively flexible

Take home message

- We have shown that **food quality affects cognition** in mice but **not personality**
- Despite our expectations, **mice on the SQ diet were more flexible**, despite being on a less advantageous diet for cognitive flexibility
- Perhaps **behavioural flexibility** in this case was **more advantageous** for our mice on both diets than cognitive flexibility

Thank you for your attention

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