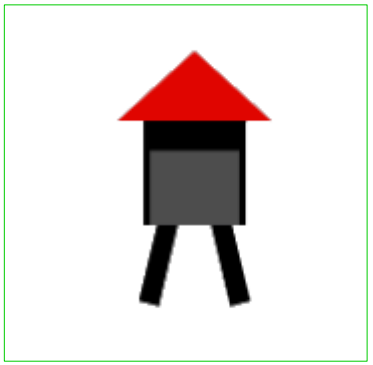
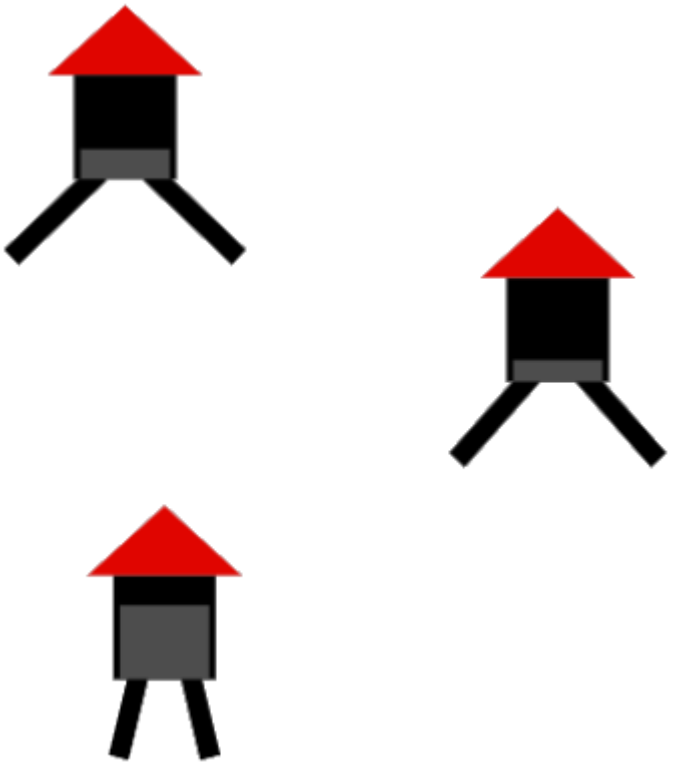
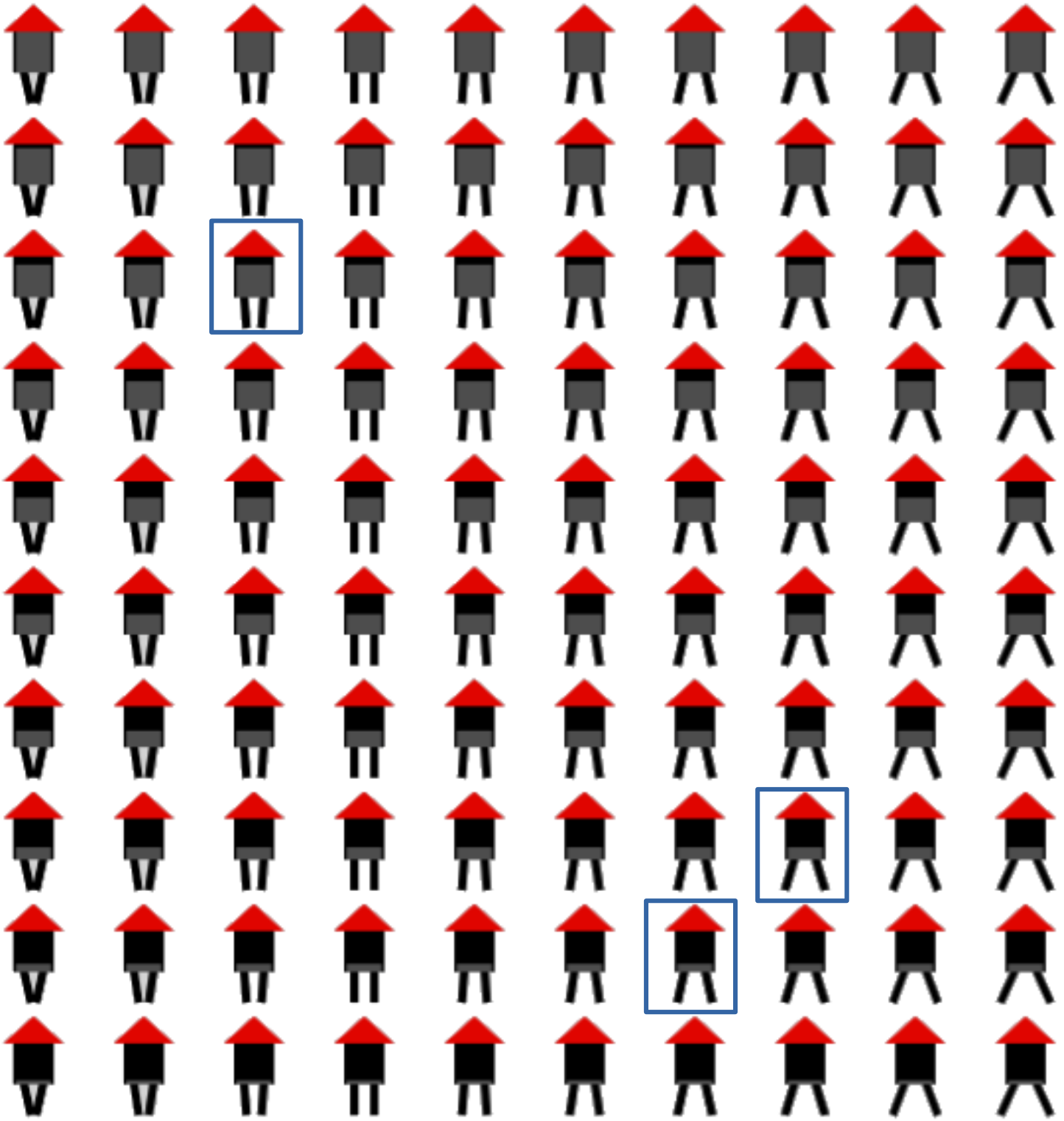
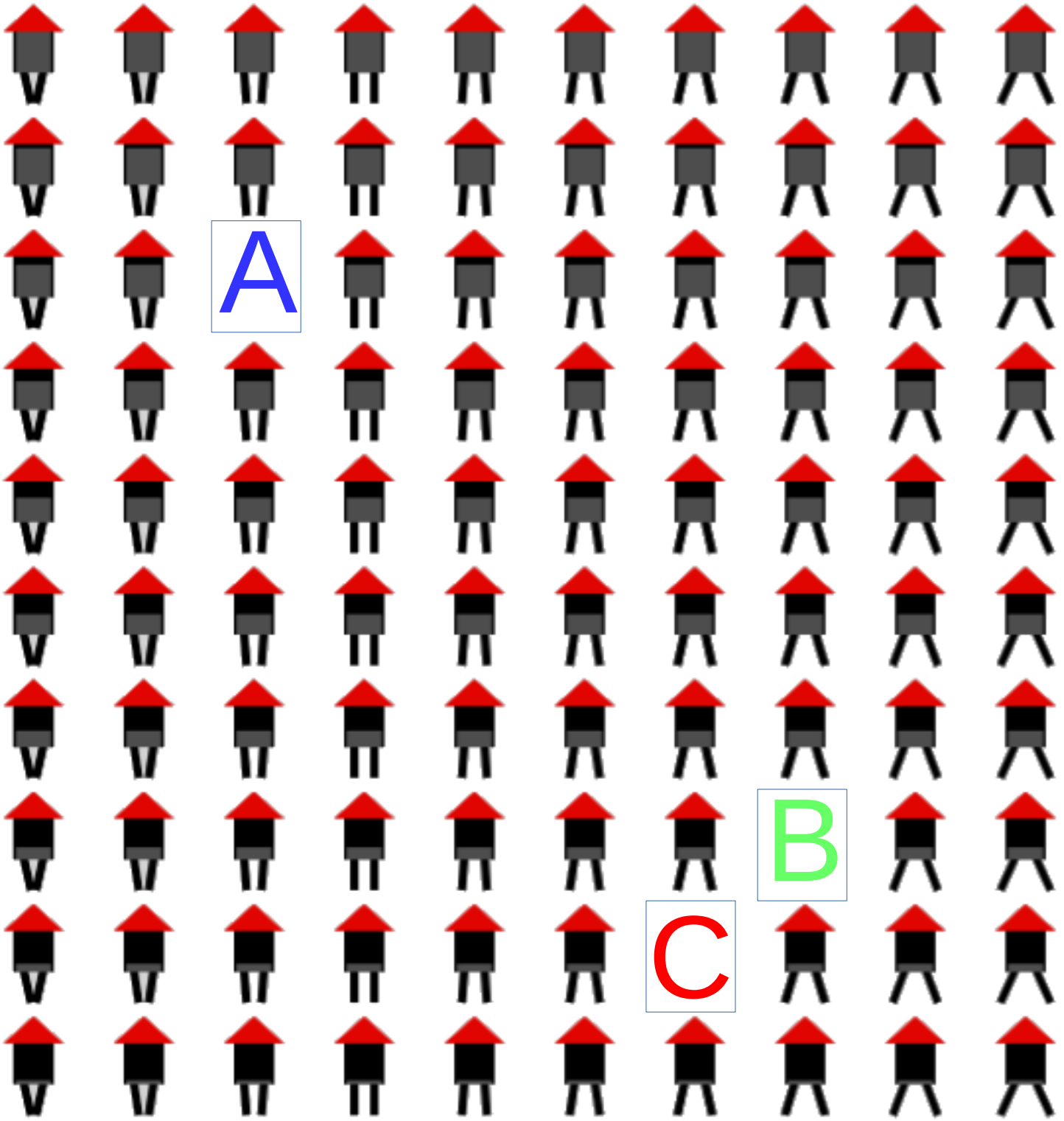
Decision making with rockets

(and why you might care)







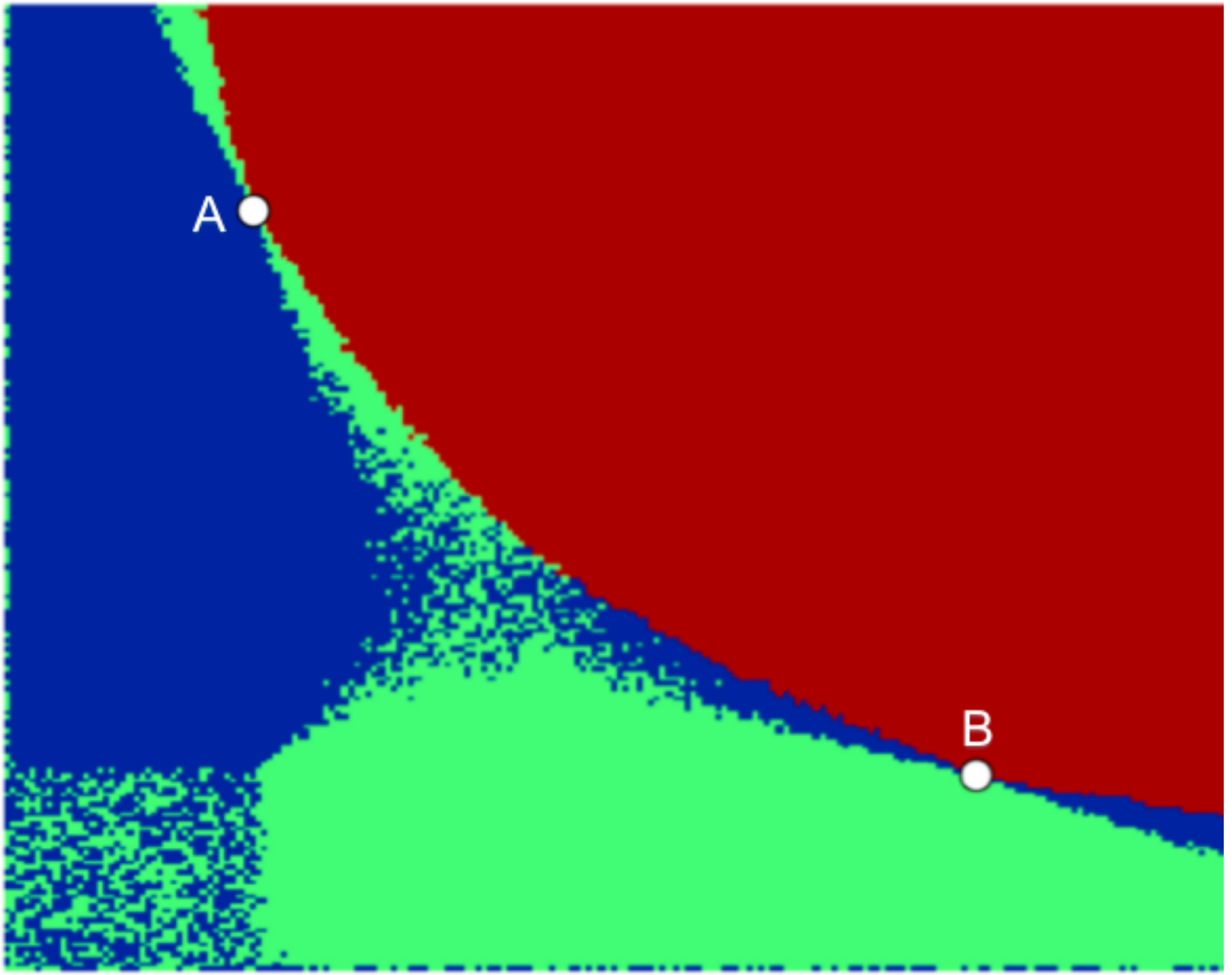

A
B
C

Choice

A

B

C



Source: Bergner, Oppenheimer & Detre (2019)

Perception:

Valuation:

Uncertainty/information gathering:

Perception:

- Lateral inhibition between neighbours

  (Multialternative decision field theory)

- ‘Salience’ of features varies by context

  (Associative accumulation model)

Valuation:

Uncertainty/information gathering:

Perception:

- Lateral inhibition between neighbours

  (Multialternative decision field theory)

- ‘Salience’ of features varies by context

  (Associative accumulation model)

Valuation:

- Values normalised across the set of options

  (Context sensitive value model)

- Ranks estimated not values

  (Decision by sampling)

Uncertainty/information gathering:

Perception:

- Lateral inhibition between neighbours

  (Multialternative decision field theory)

- ‘Salience’ of features varies by context

  (Associative accumulation model)

Valuation:

- Values normalised across the set of options

  (Context sensitive value model)

- Ranks estimated not values

  (Decision by sampling)

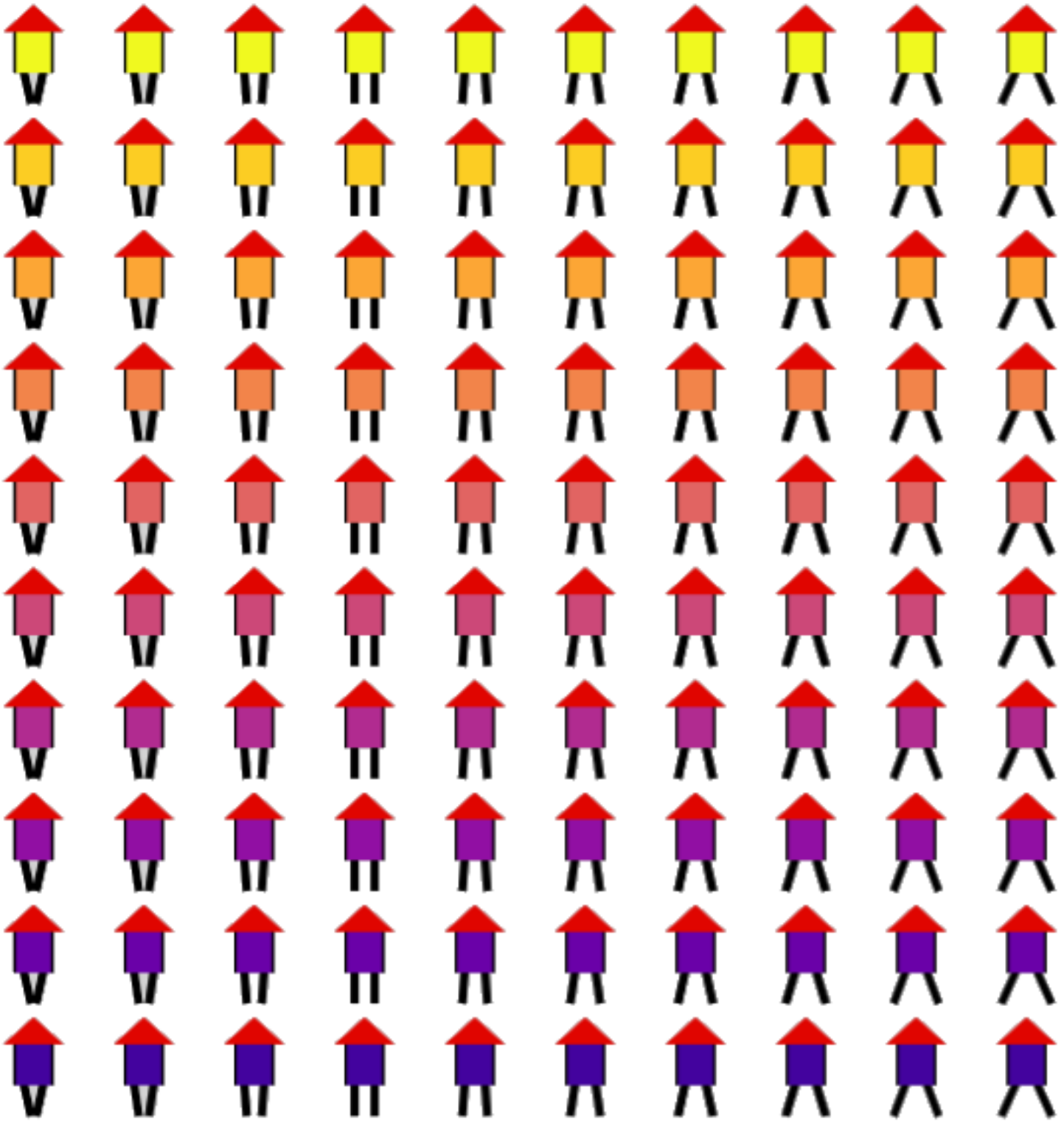
Uncertainty/information gathering:

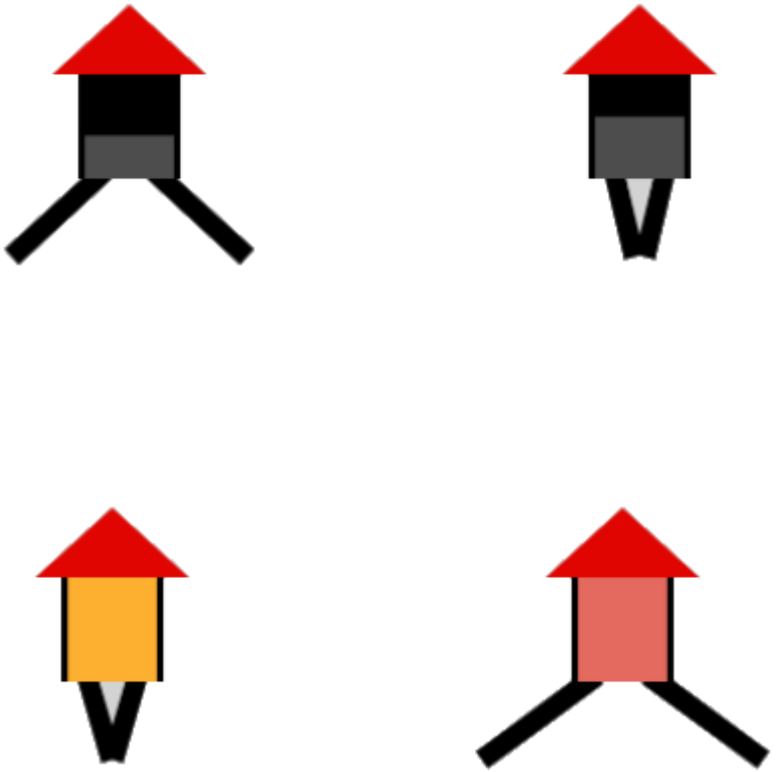
- Attention switching between features

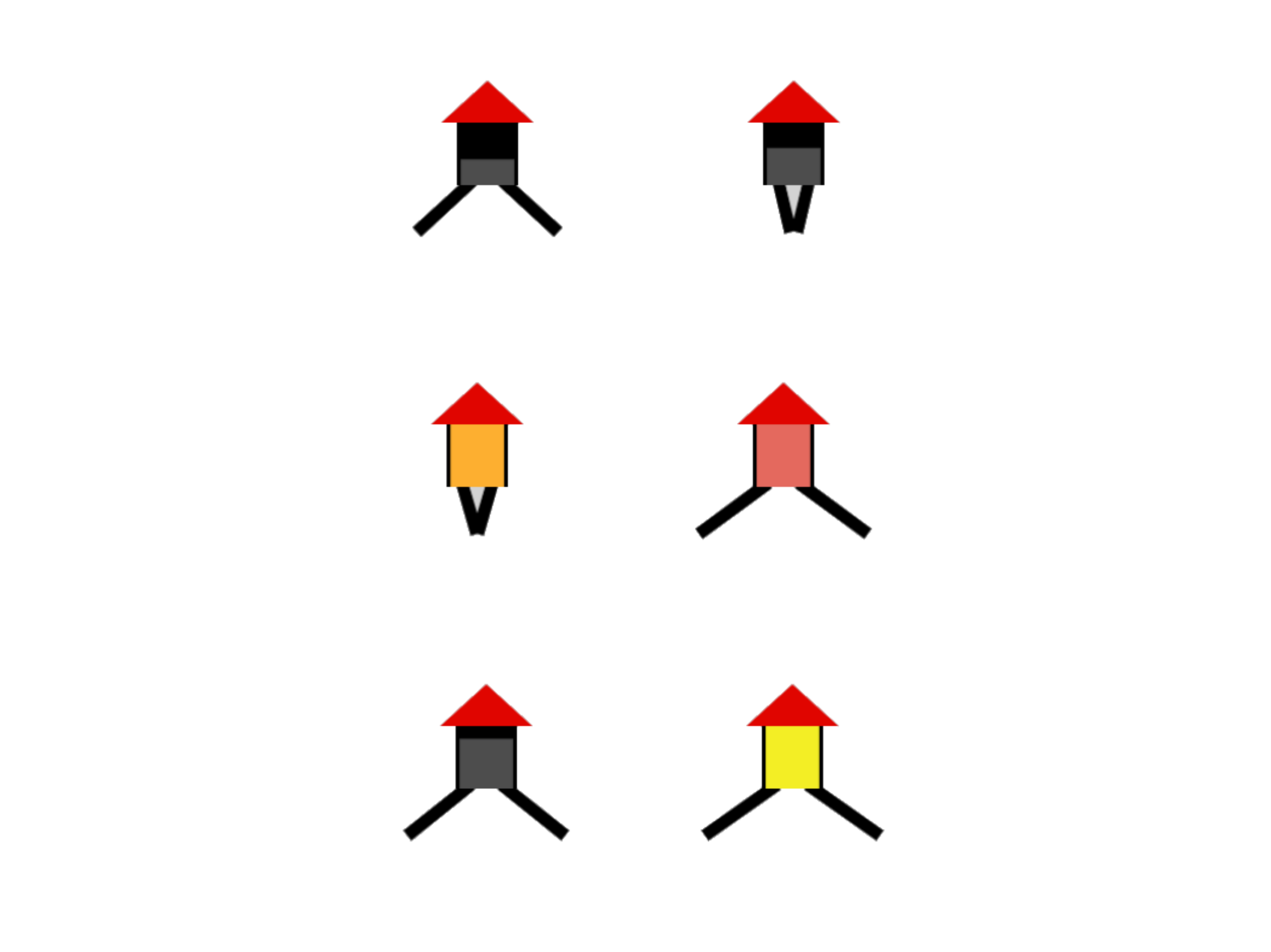
  (Multiattribute leaky accumulators)

- Comparisons as raw input

  (Expected value maximisation plus noise)

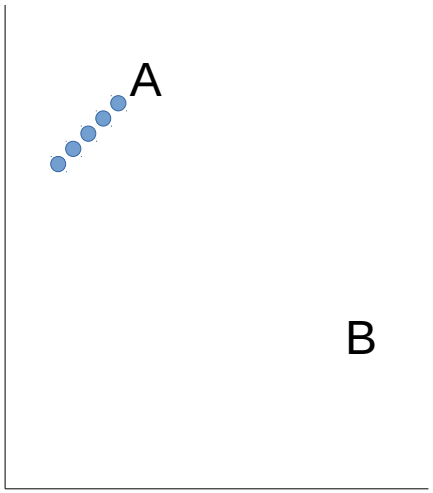






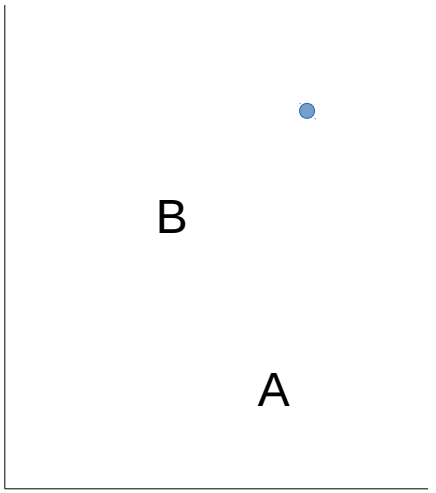
Experiment design

- Pairs: Compare base only (10 trials, gaps .03 to .3)
- Pairs: Compare fuel only (10*3 comparison types, gaps .03 to .3)
- Pairs: Compare on distance (10*3 comparison types, rnd gaps)
- Triads: Compare on distance



Attraction/similarity

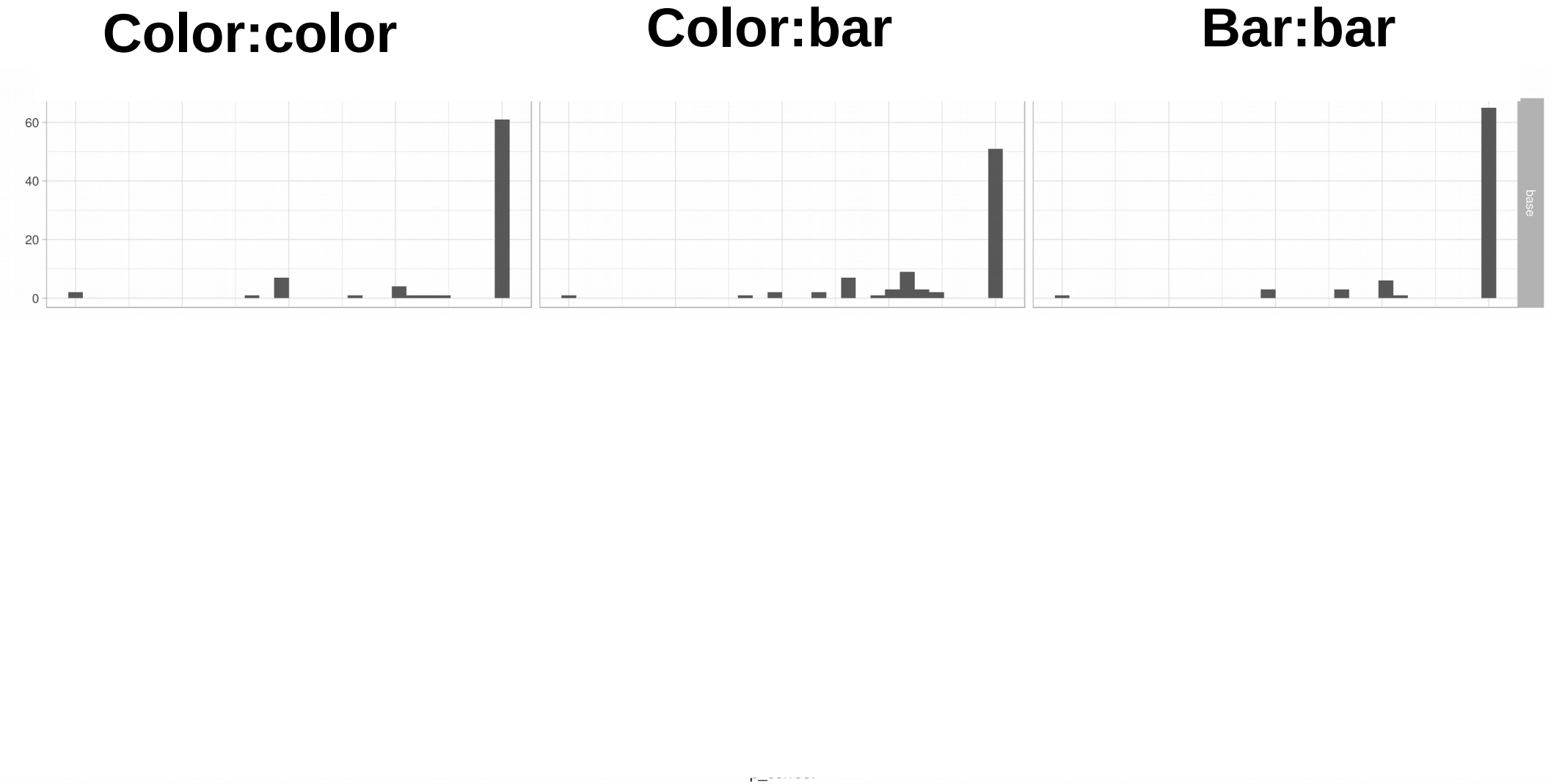
Compromise



Random

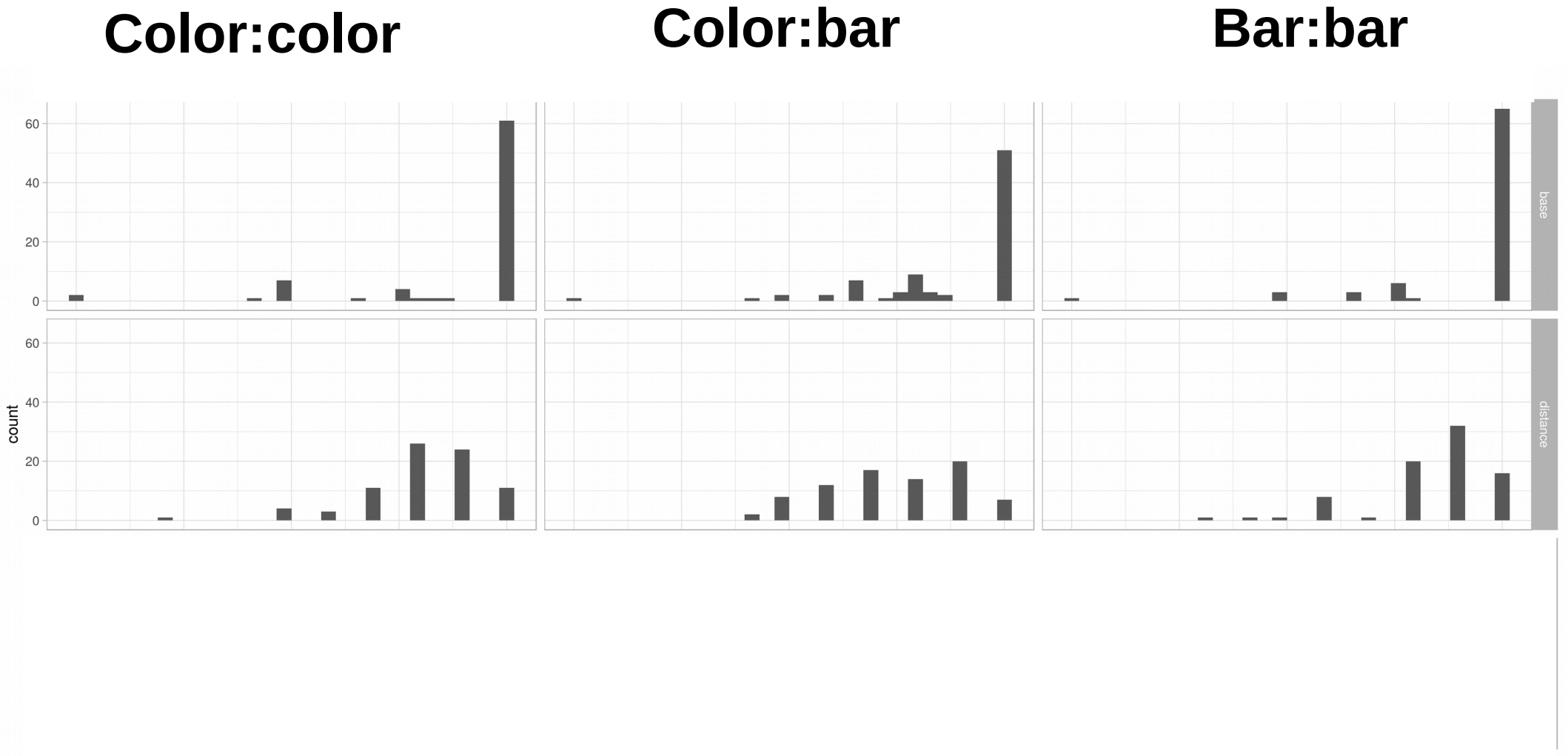
$(5 + 1 + 1)_{trialtypes} * 8_{comparisontypes}$ = 56 triad trials per participant. 126 total including pairs

Pairs: best base



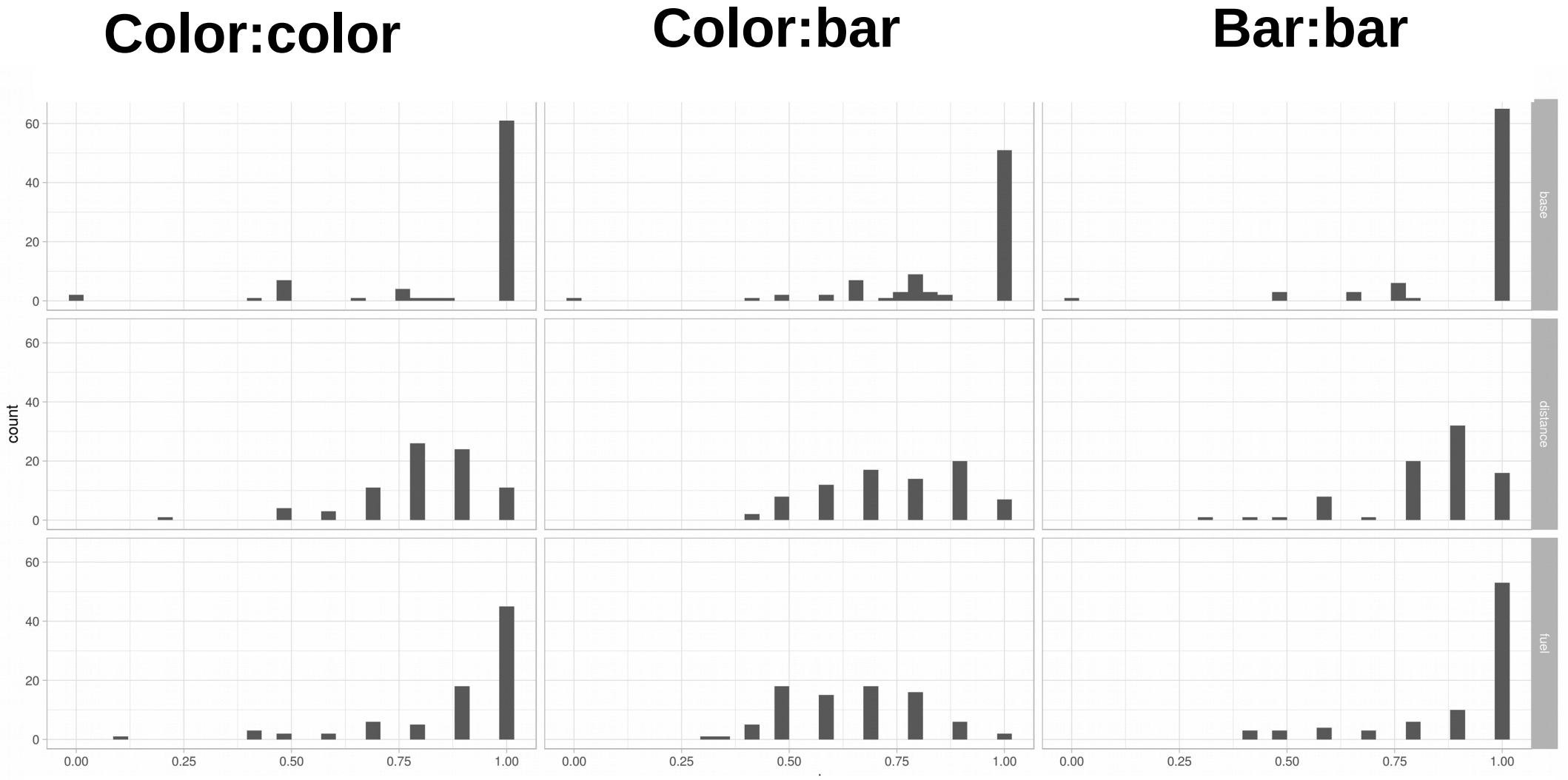
Participant accuracy

Pairs: best distance

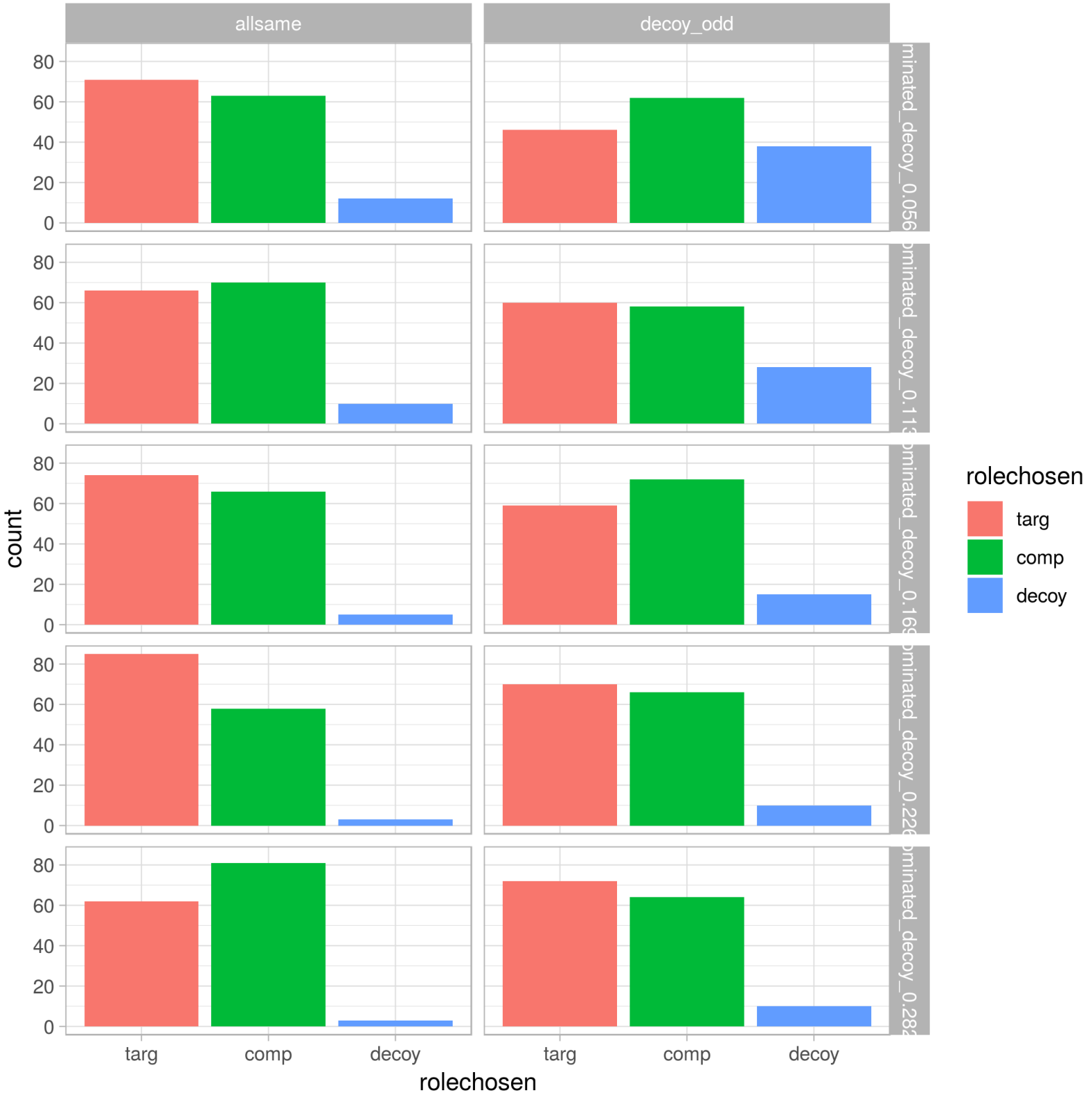


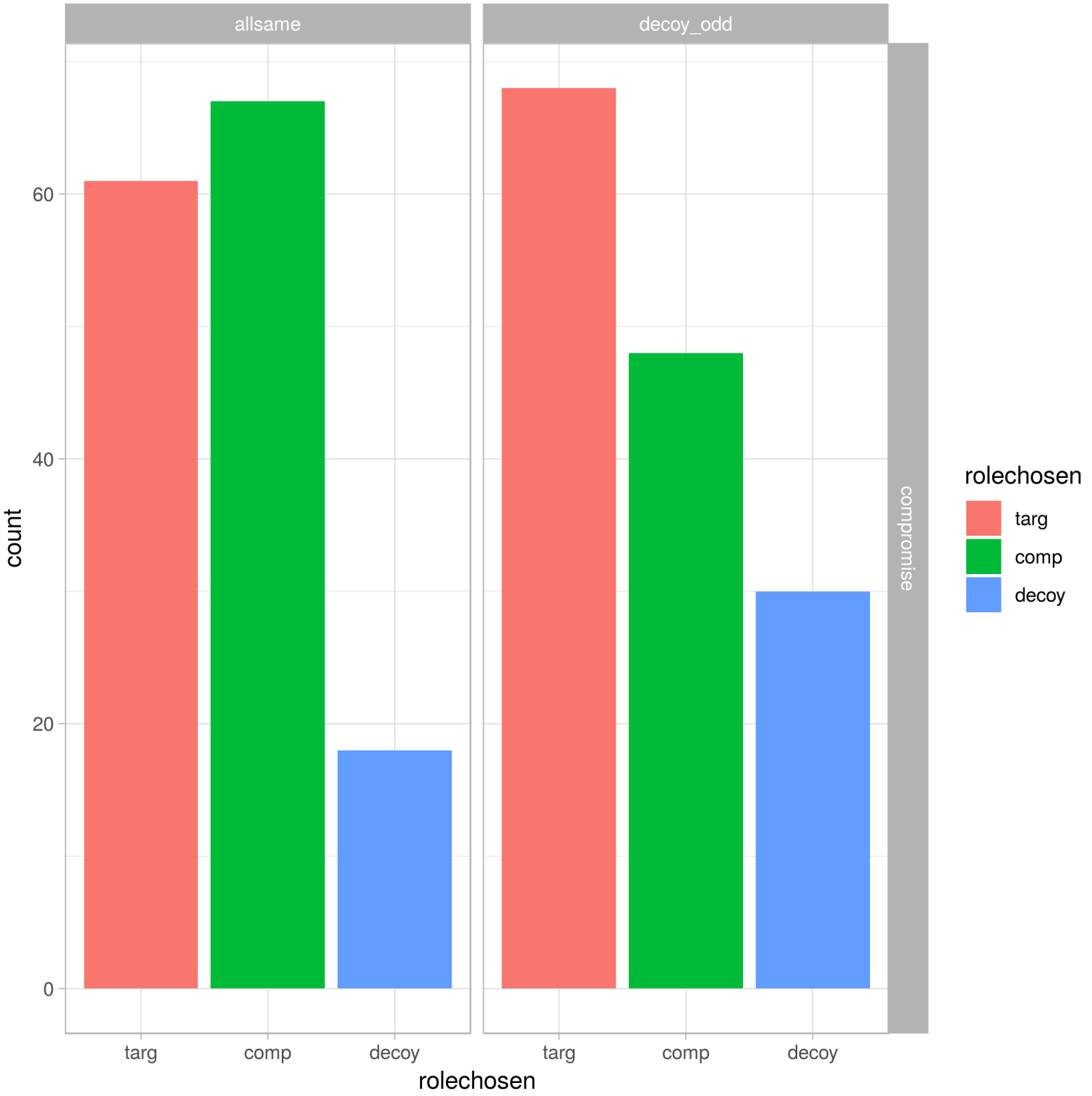
Participant accuracy

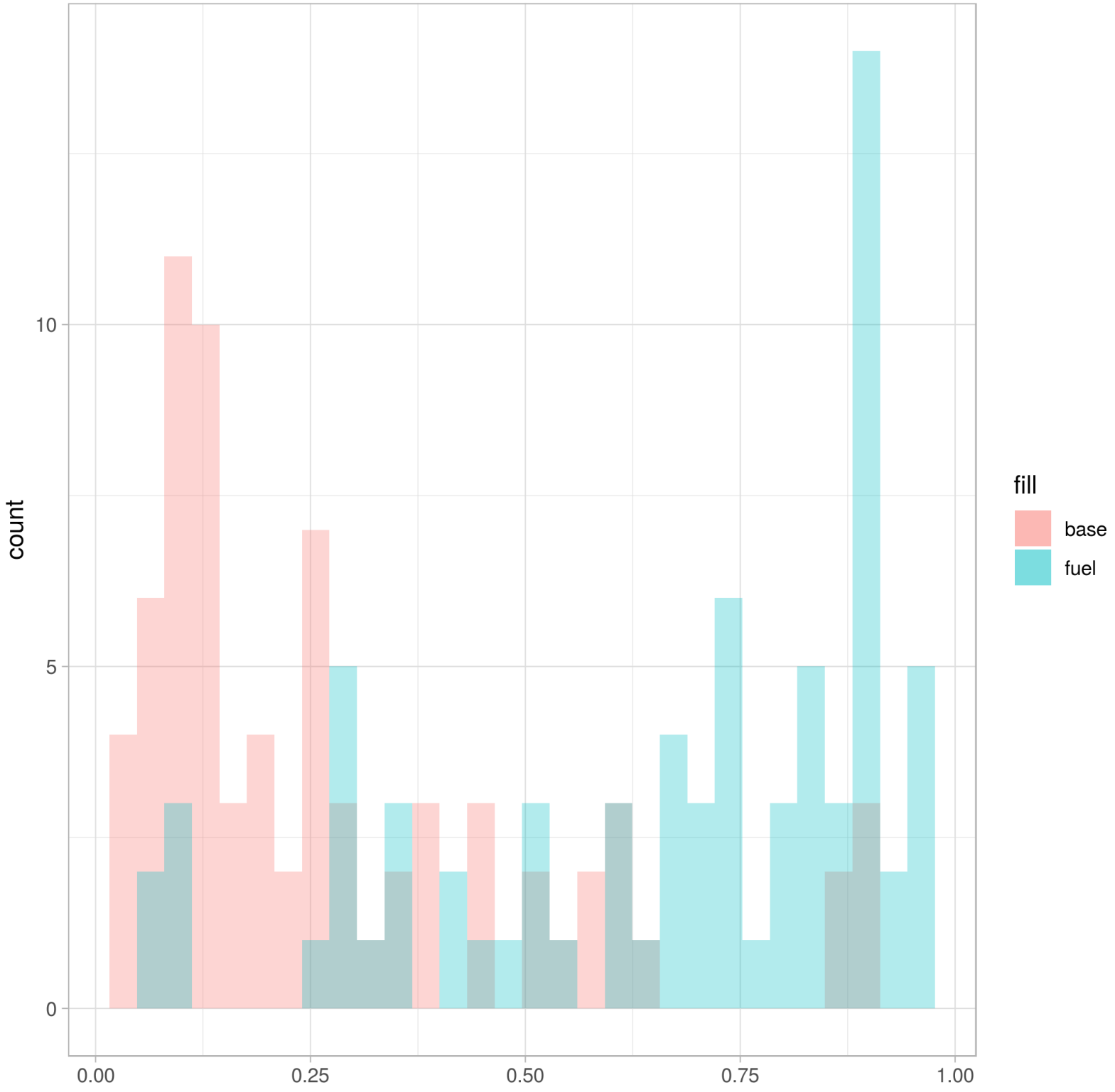
Pairs: best fuel



Participant accuracy


allsame
decoy_odd
minated_decoy_0.056
minated_decoy_0.113
minated_decoy_0.169
minated_decoy_0.226
minated_decoy_0.28
count
0
20
40
60
80
targ
comp
decoy
rolechosen
rolechosen
targ
comp
decoy


allsame
decoy_odd
compromise
count
60
40
20
0
targ
comp
decoy
rolechosen
rolechosen
targ
comp
decoy


count
10
5
0
0.00
0.25
0.50
0.75
1.00
fill
base
fuel


allsame
comp_odd
decoy_odd
targ_odd
compromise
nated_decoy_0.0
inated_decoy_0.1
inated_decoy_0.1
inated_decoy_0.2
inated_decoy_0.2
random
count
0
20
40
60
80
targ
comp
decoy
rolechosen