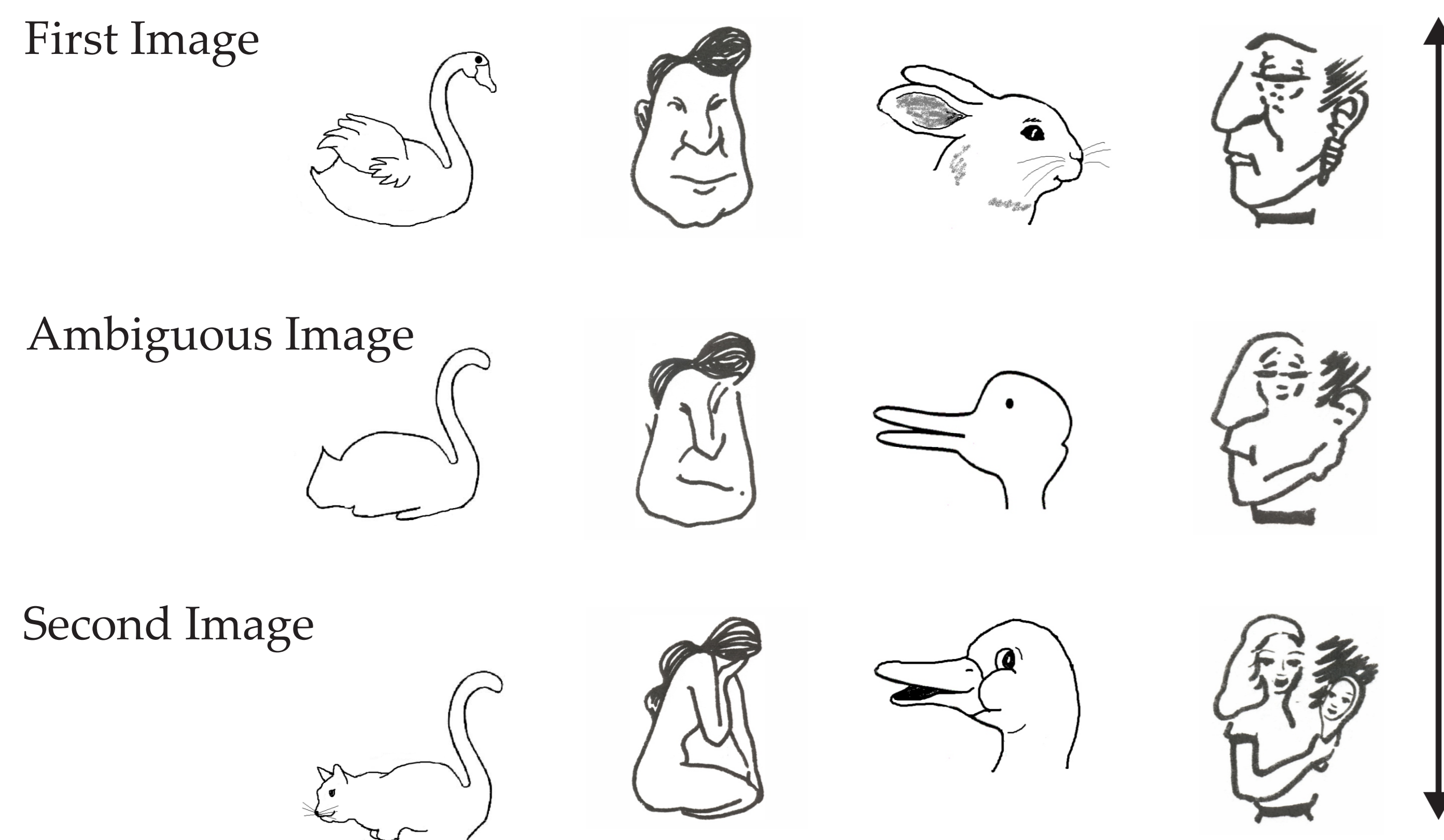


Search for a general updating deficit

- Mental model = hypothesis about the world based on experience
- When predictions of mental model \neq incoming data:
 - (1) detect mismatch
 - (2) revise model
- Updating in the right hemisphere: Danckert et al (2012): RBD impairment to exploit a changing bias in a rock, paper, scissors game.
 - (1) Impairment of model building or updating?
 - (2) Learned helplessness due to a too long task?
 - (3) Poor statistical reasoning or reward processing?
- If Right Hemisphere responsible for updating: Updating impairment in a different task that
 - (1) does not require learning a model in the first place
 - (2) is easy & less dependent on detecting statistic regularities in the world & does not require reward processing

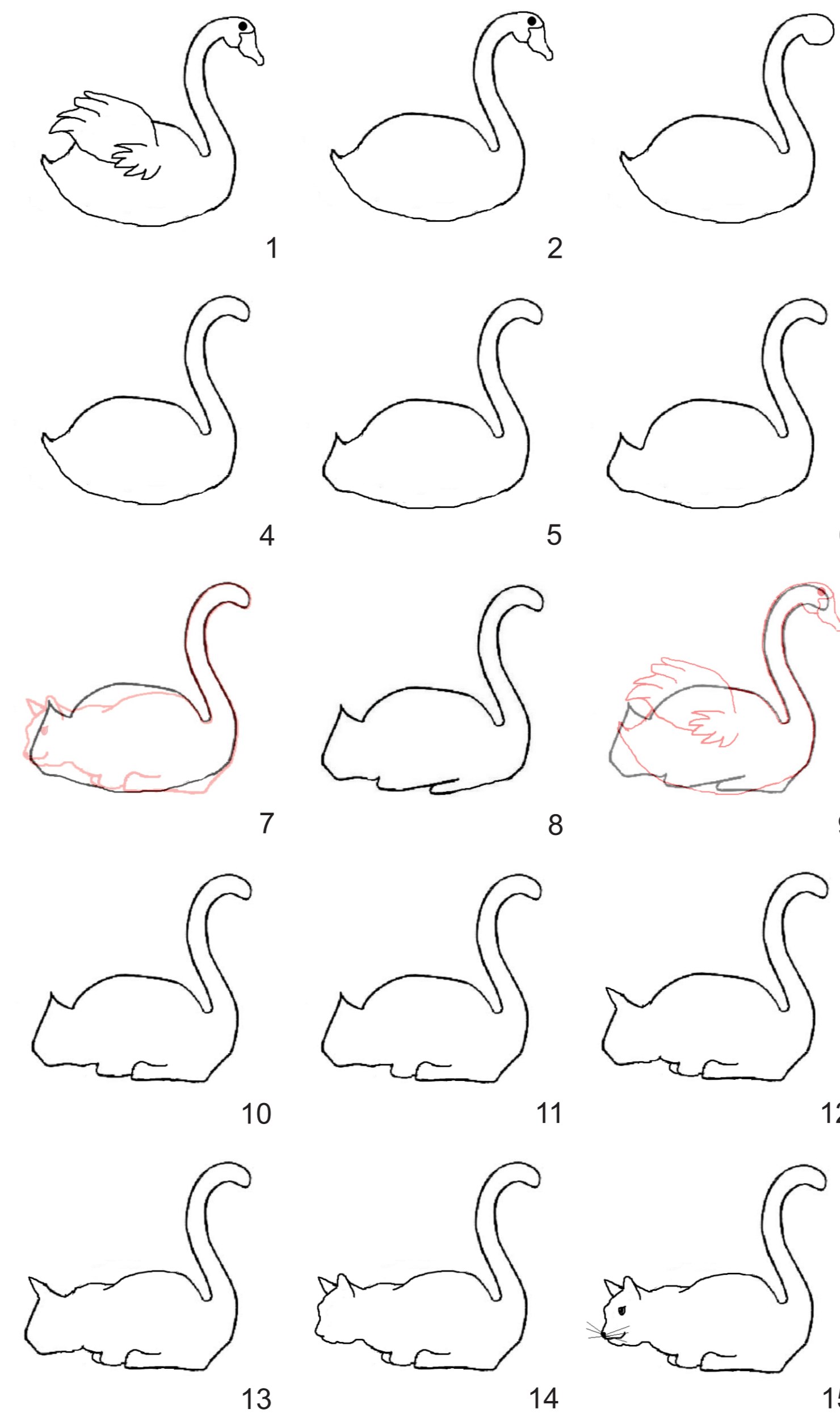
Ambiguous figures: quick & easy updating



- Four picture sets based on ambiguous figures (picture # 8)
- Pictures changed gradually to the two extremes
- 17 pictures per picture set (15 pictures + 2 catch trials)
- 8 different sequences – counterbalanced between participants

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Updating models based on gradual change



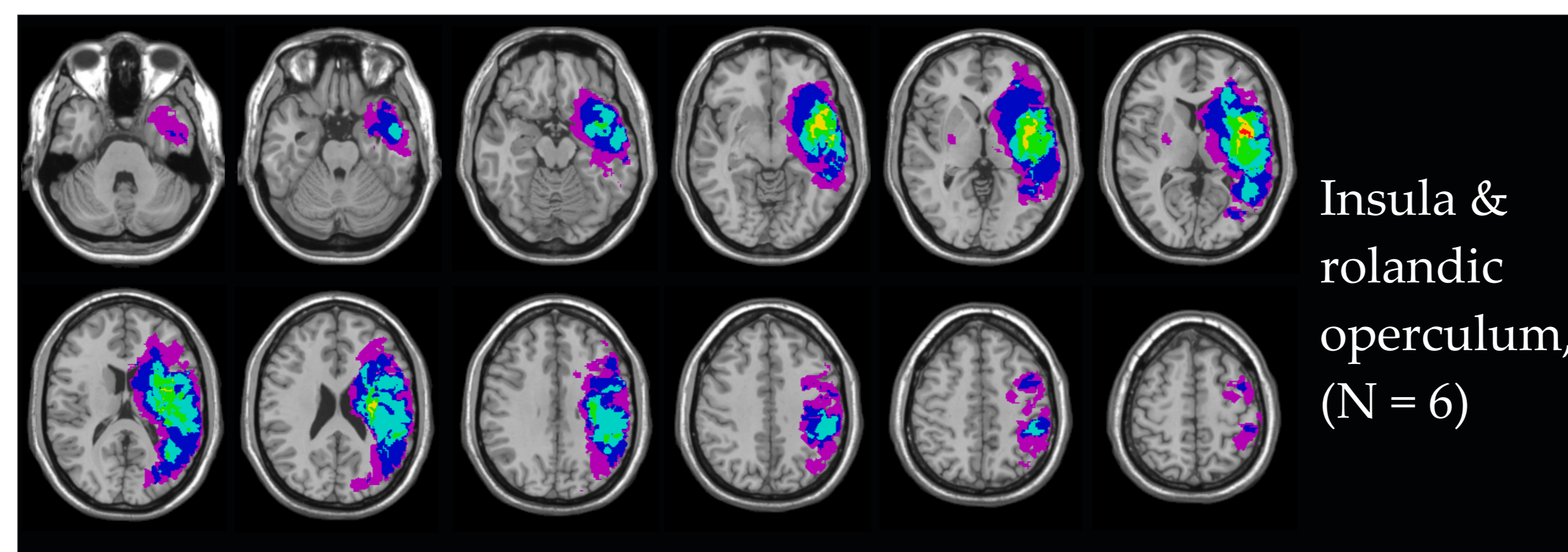
Instruction:
“I will show you series of pictures that begin with the picture of a commonly known object. It will then change gradually over the pictures to finally show a completely different object by the end of the series. Tell me for each picture what you see”.

Dependent Variable:
first object reports

Logic: The longer participants stick with the first object, the less efficiently they update.

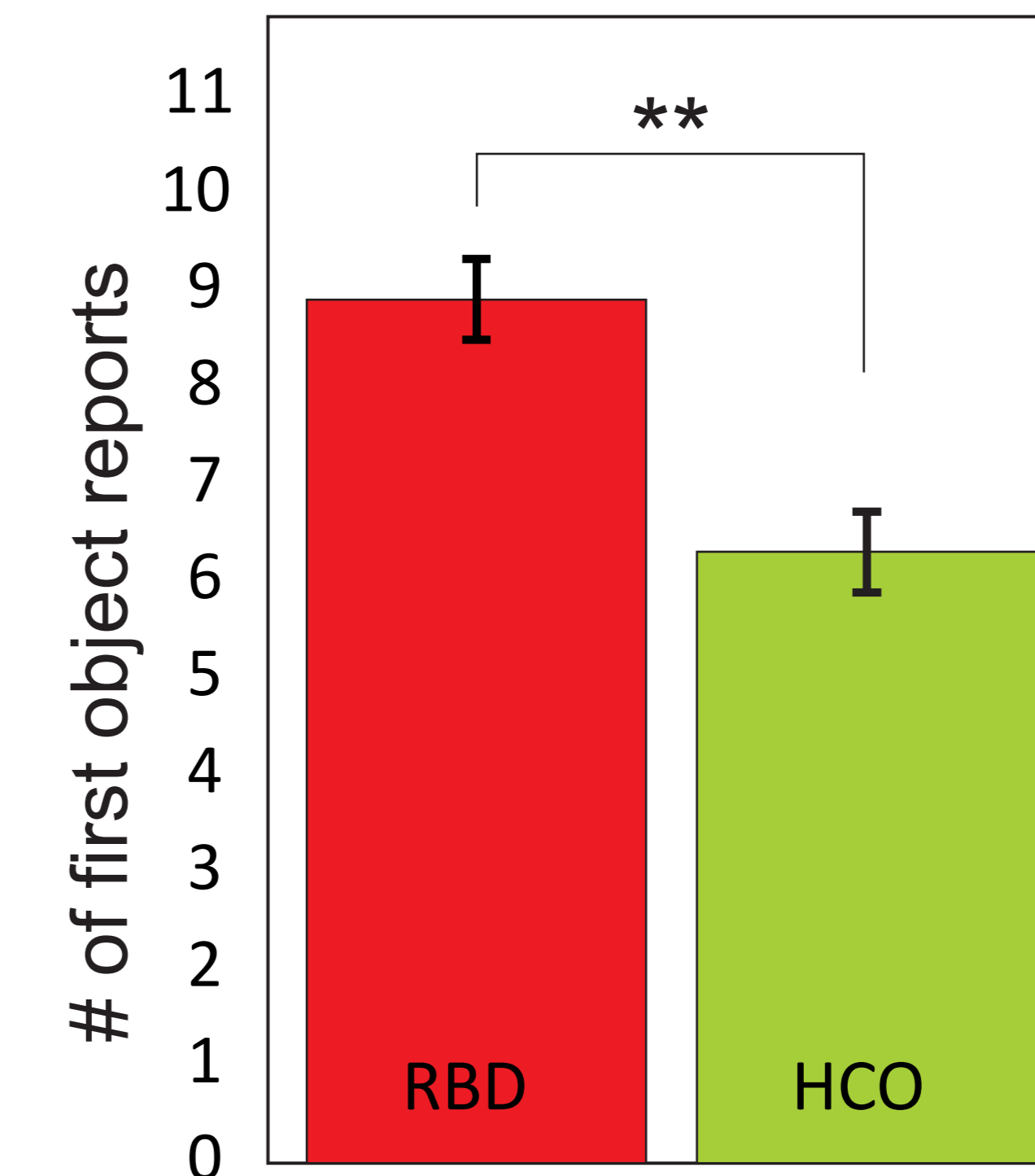
Right Brain Damaged (RBD)	Healthy Controls (HCO)
N = 12 (8 male)	N = 12 (7 male)
Moca* = 23.17 (± 4.57)	Moca = 26.6 (± 2.0)
Age* = 65.00 (± 8.10) years,	Age = 72.25 (± 5.22) years

Lesions predicting the worst performance



Insula & rolandic operculum, (N = 6)

RBDs significantly impaired in updating



General cognitive impairment?

Moca & # first object reports:
HCO: $\tau = -.68^{**}$, $p < .01$
RBD: $\tau = -.19$, $p > .40$

Perseveration?

- all participants 100% correct on catch trials
- RBDs see differences, BUT they interpret these difference in favor of the first object

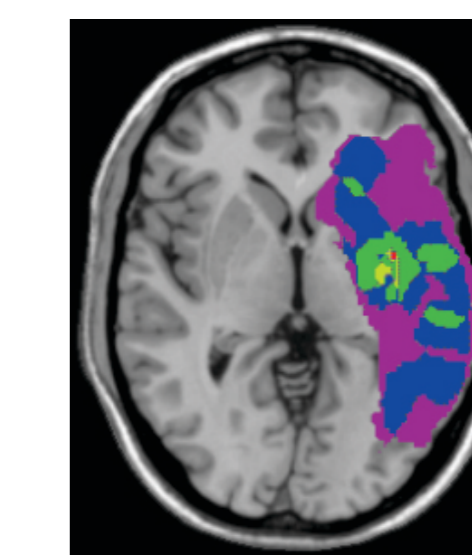
Seeing change but not updating



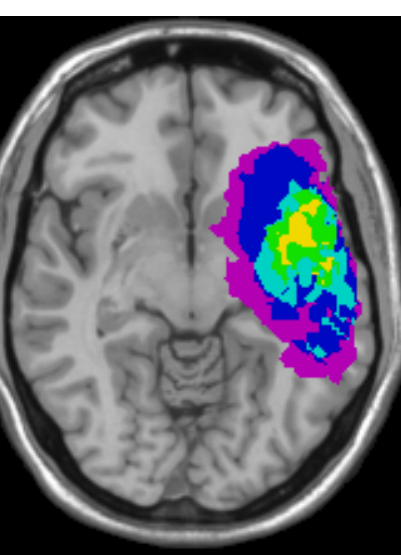
1	Lady looking in the mirror
2	Lady looking in the mirror
3	Lady looking in the mirror
4	Lady looking in the mirror
5	Lady looking in the mirror
6	Something is going around her waist
7	She looks in a different direction
8	Mirror looks towards us
9	Woman holding a baby
10	Woman holding a baby; mouth of baby open
11	Woman holding a baby
12	Baby looking at the mother; maybe choking
13	Guy
14	Guy, sleeping
15	Guy, ear

Insula may be the key

Danckert et al (2012):
Worst performance in the rock, paper, scissors game



Ambiguous figures:
Worst performance in the ambiguous figures task



Updating and Theory of Mind (ToM)

- Griffin et al (2006): lesions in the right BA 44 & 45 and the right insula predicts ToM impairment in RBD patients
- Rafetseder et al (in prep.): Correlation ToM & updating in 5 year olds