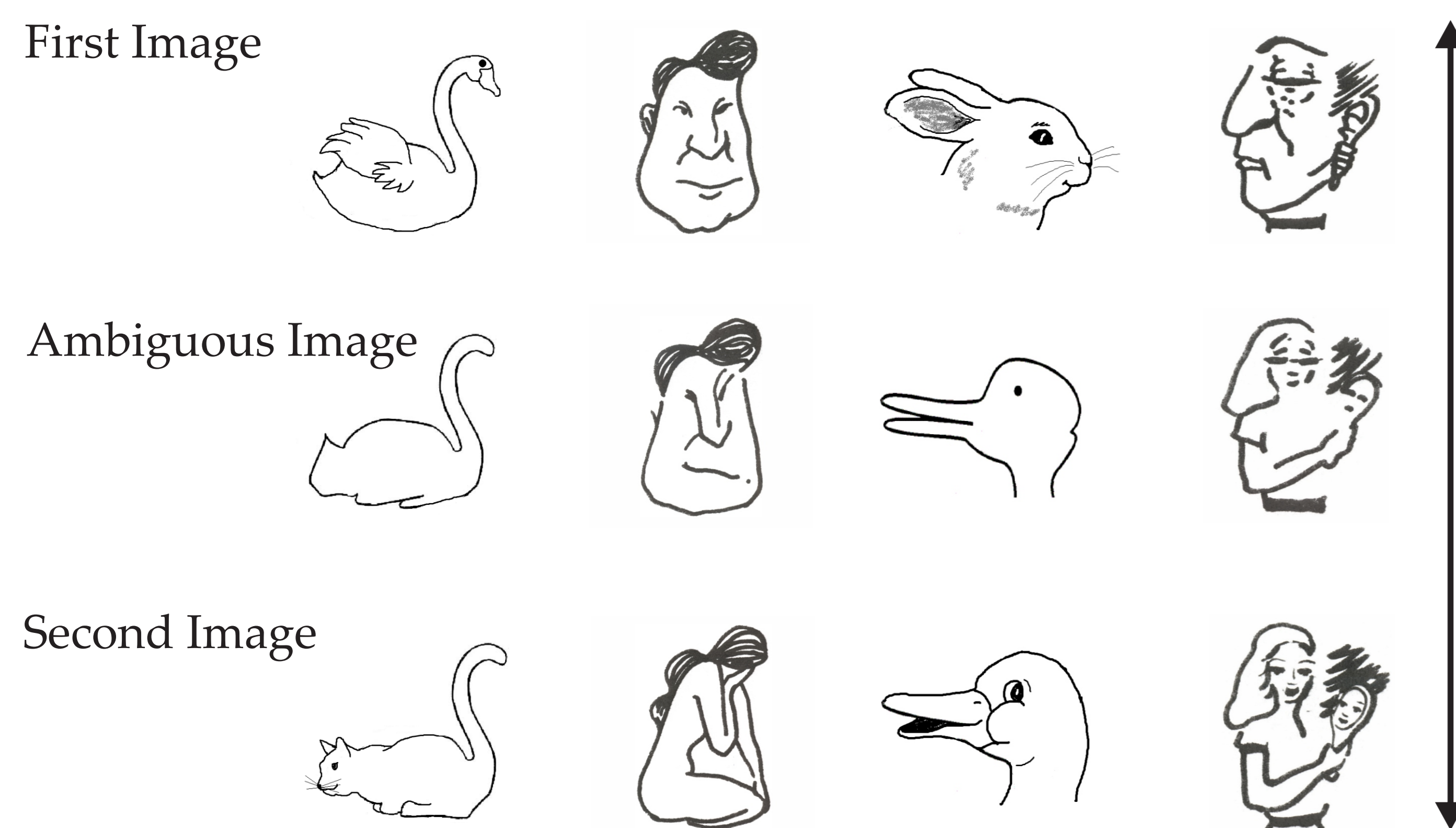


Updating deficit after right brain damage

- 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):
- If Right Hemisphere responsible for updating: updating impairment in a different task that does not require learning & is independent on detecting statistic regularities

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

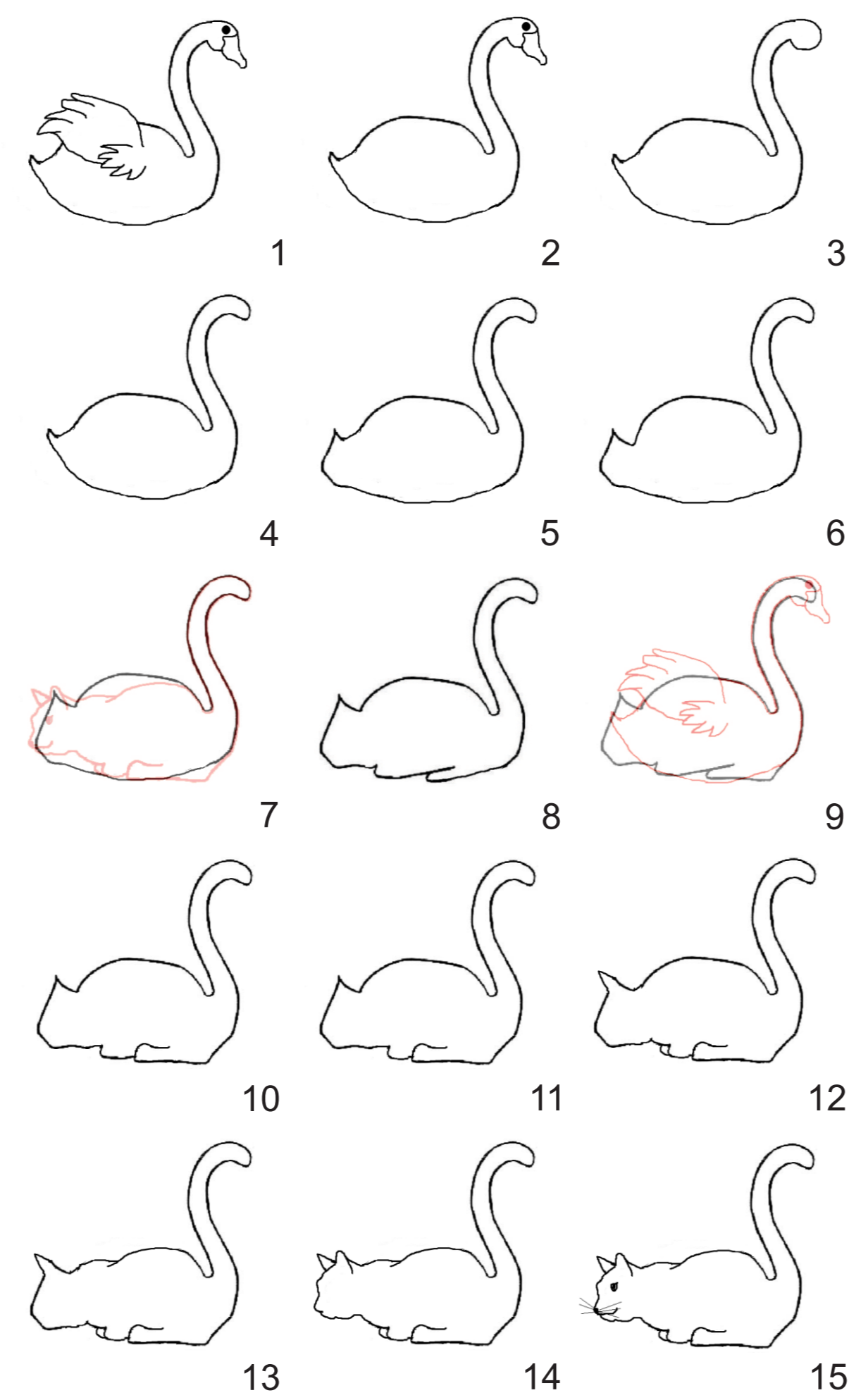
Ambiguous figures: quick & easy updating



- 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



Instructions:

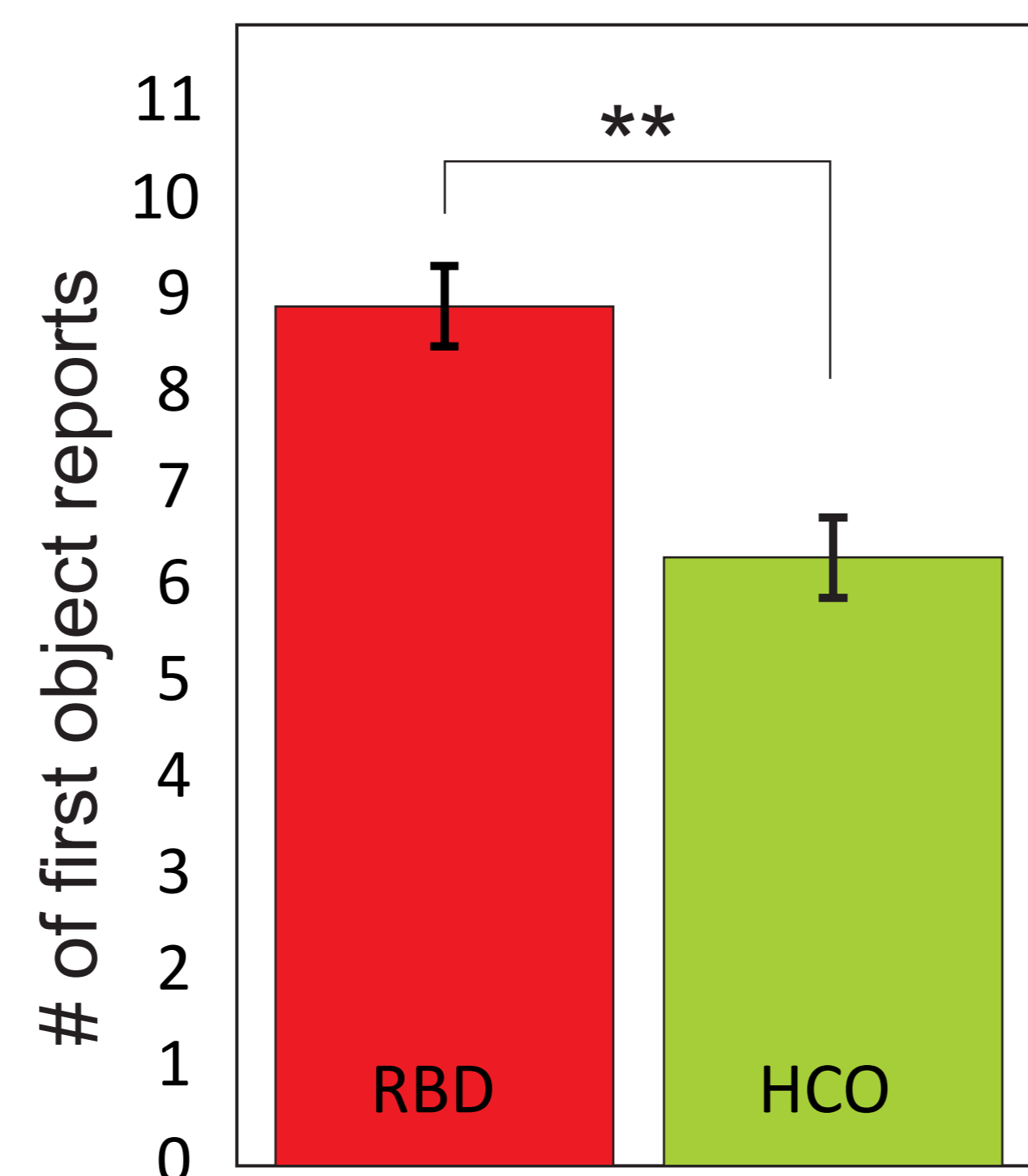
"I will show you series of pictures that begin with the picture of a commonly known object. **It will then change gradually over the pictures to finally show a completely different object** by the end of the series. Tell me for each picture what you see".

Dependent Variable:

first object reports

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

RBDs significantly impaired in updating



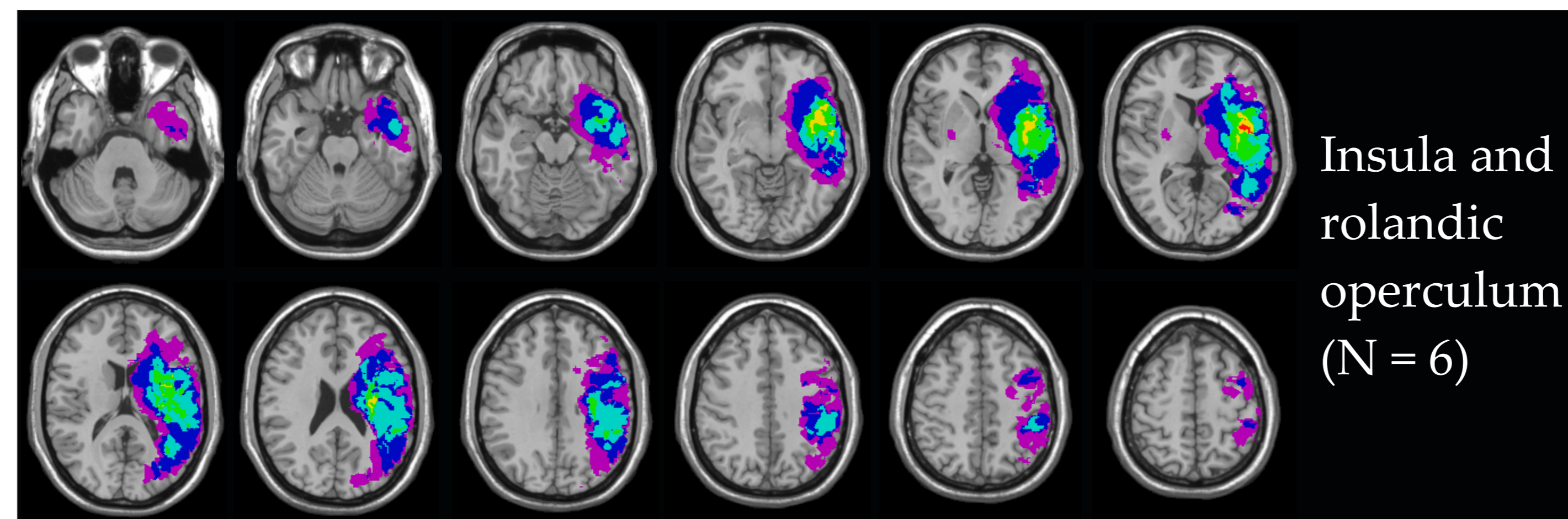
General cognitive impairment?

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 differences in favor of the first object

Lesions predicting the worst performance



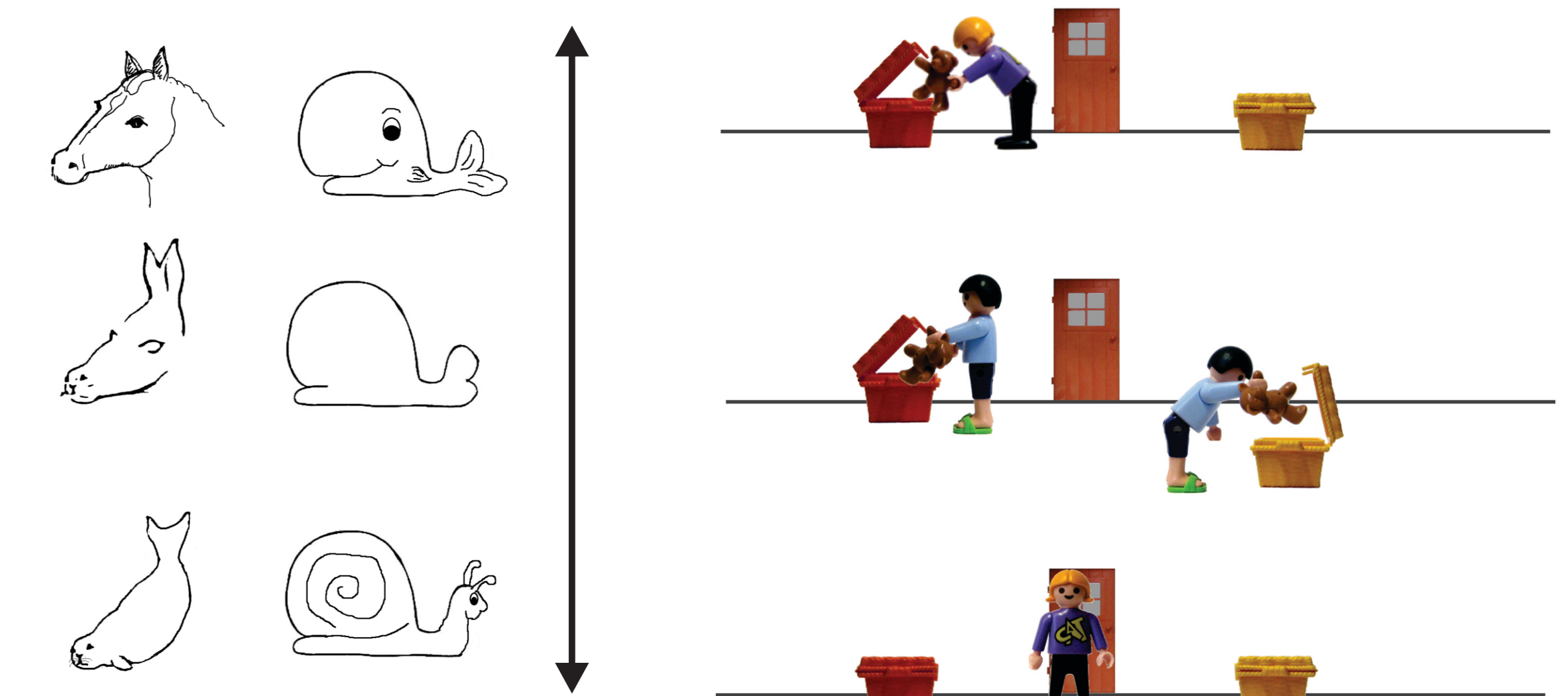
Updating and Theory of Mind (ToM)

- ToM = the ability to attribute intentional states to ourselves and others (Perner, 1991)
- Griffin et al (2006): lesions in the right BA 44 & 45 and the right insula predict ToM impairment in RBD patients

3-year olds	5-year olds
N = 14 (6 male)	N = 20 (11 male)
Understanding FB (N=0)	Understanding FB (N = 8)

Excluded if (1) 'strange' answers (2) less than two picture sets (3) unable to identify the last object (4) unable to identify both catch trials. Seven 3 year olds and three 5 year olds were excluded.

Two different sets & False Belief Task (FB)



Understanding false belief: (1) Correctly predict Lisa's behavior & (2) can explain why (referring to a mental state or relevant story facts)

False Belief understanding predicts updating

