Object Recognition in Temporal Cortex

Computational Models of Neural Systems

Lecture 8.2

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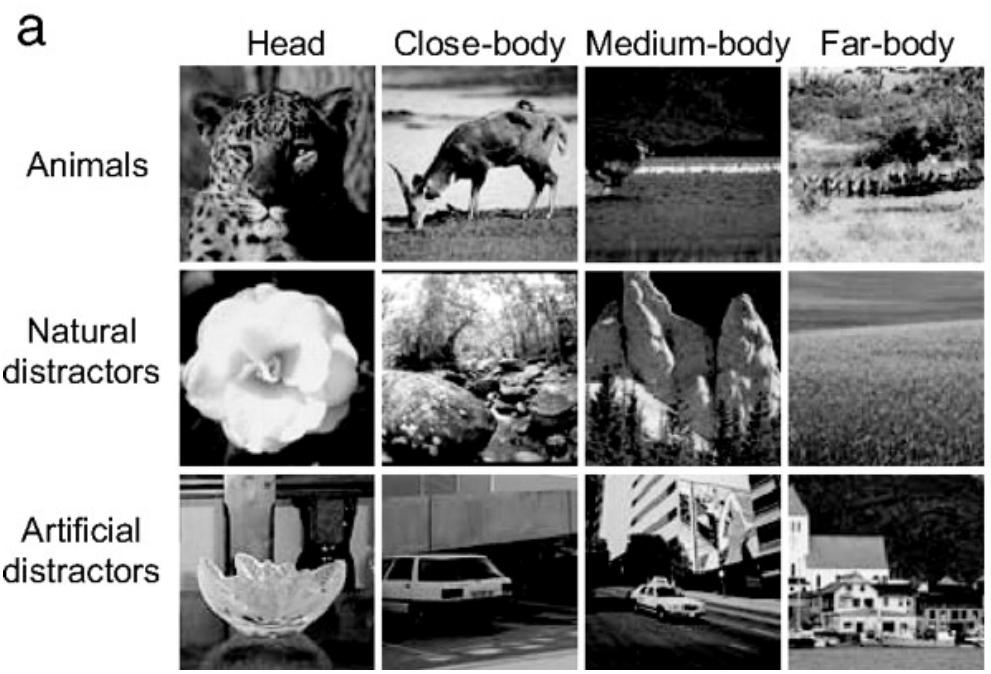
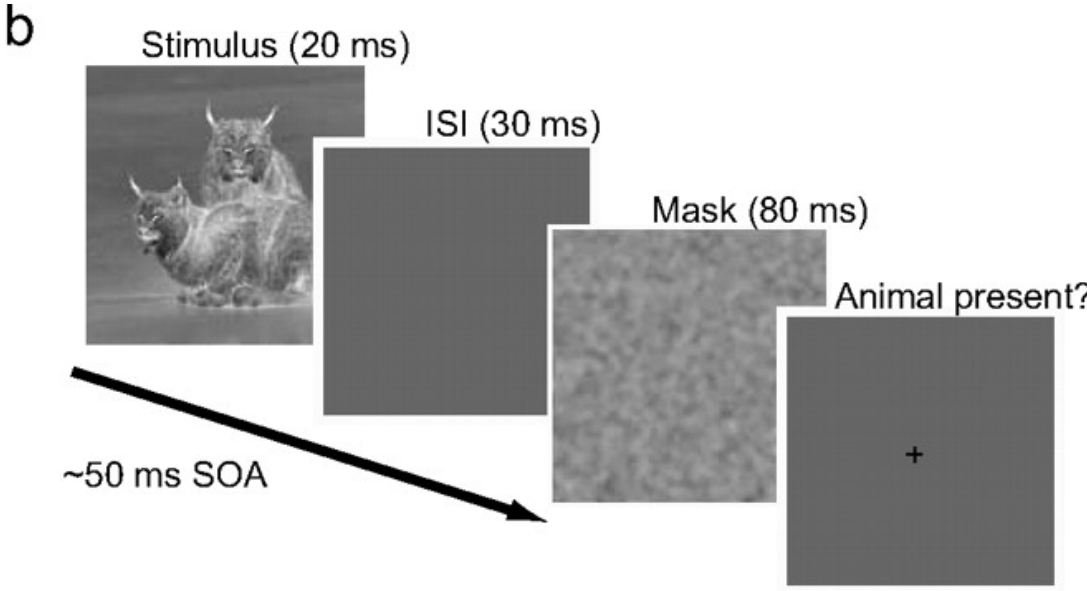
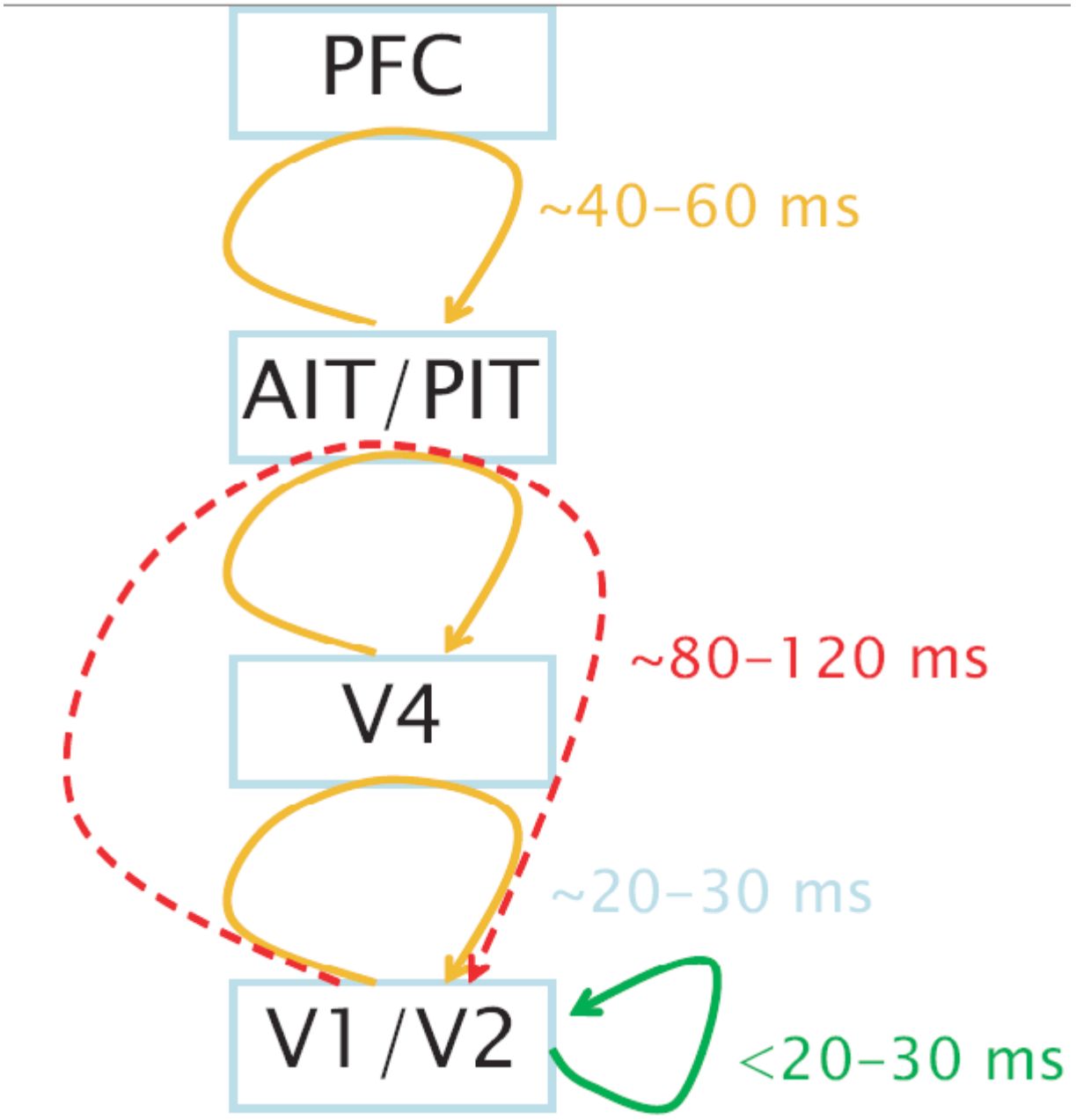
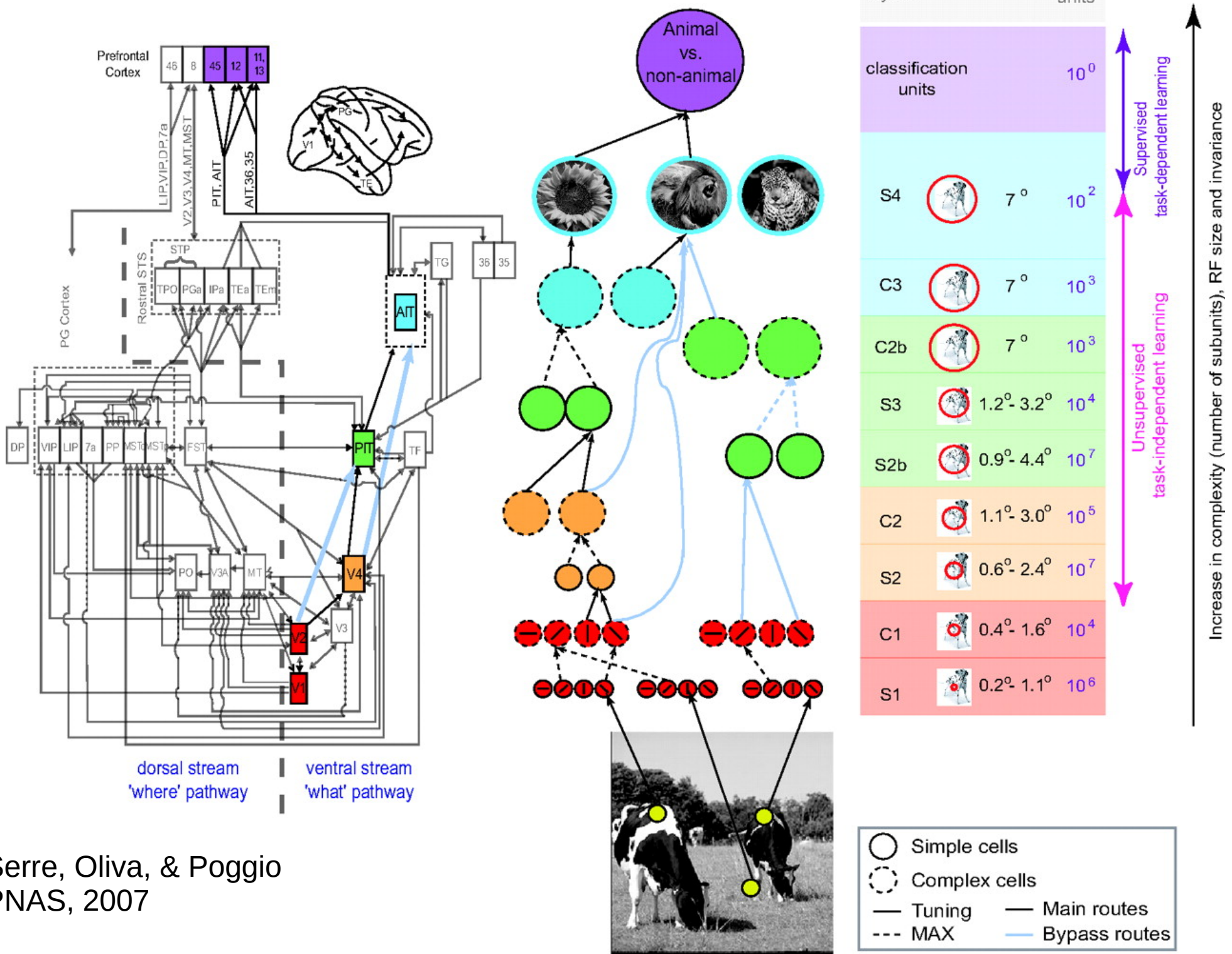
From Serre, Oliva, & Poggio (2007)



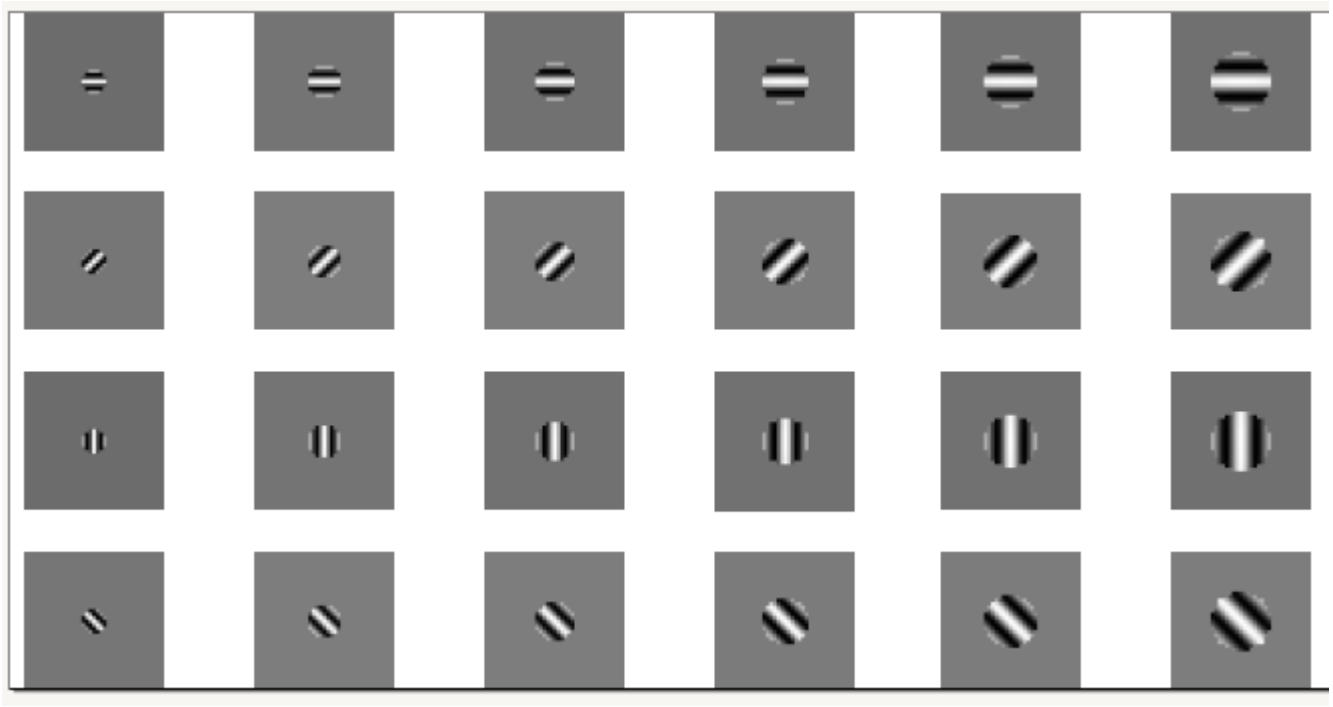


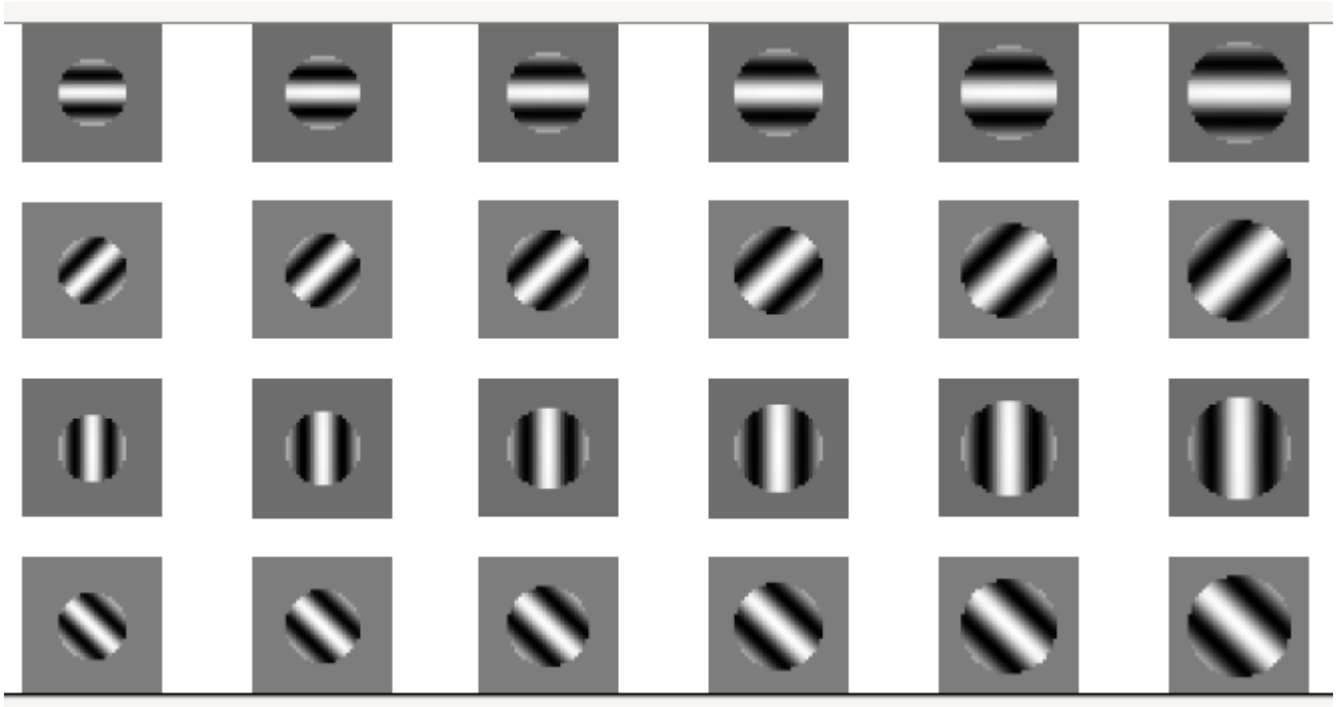
Timing of Feedback Loops: Monkeys & Humans





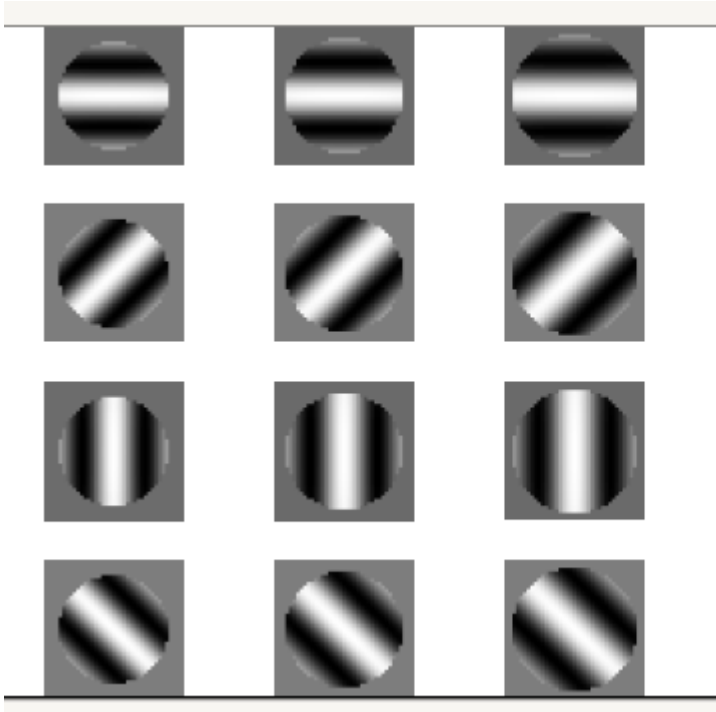
Serre, Oliva, & Poggio
PNAS, 2007

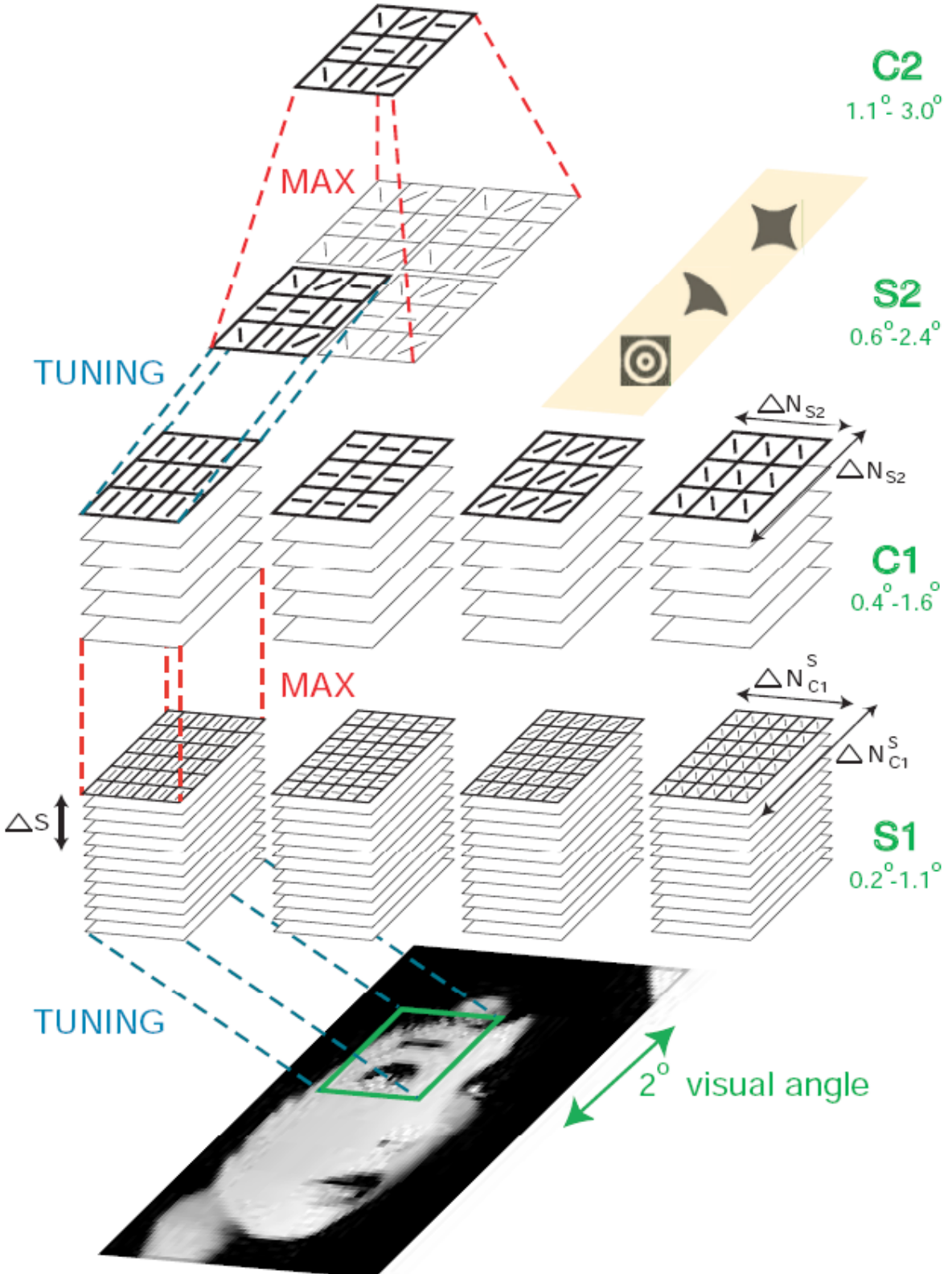


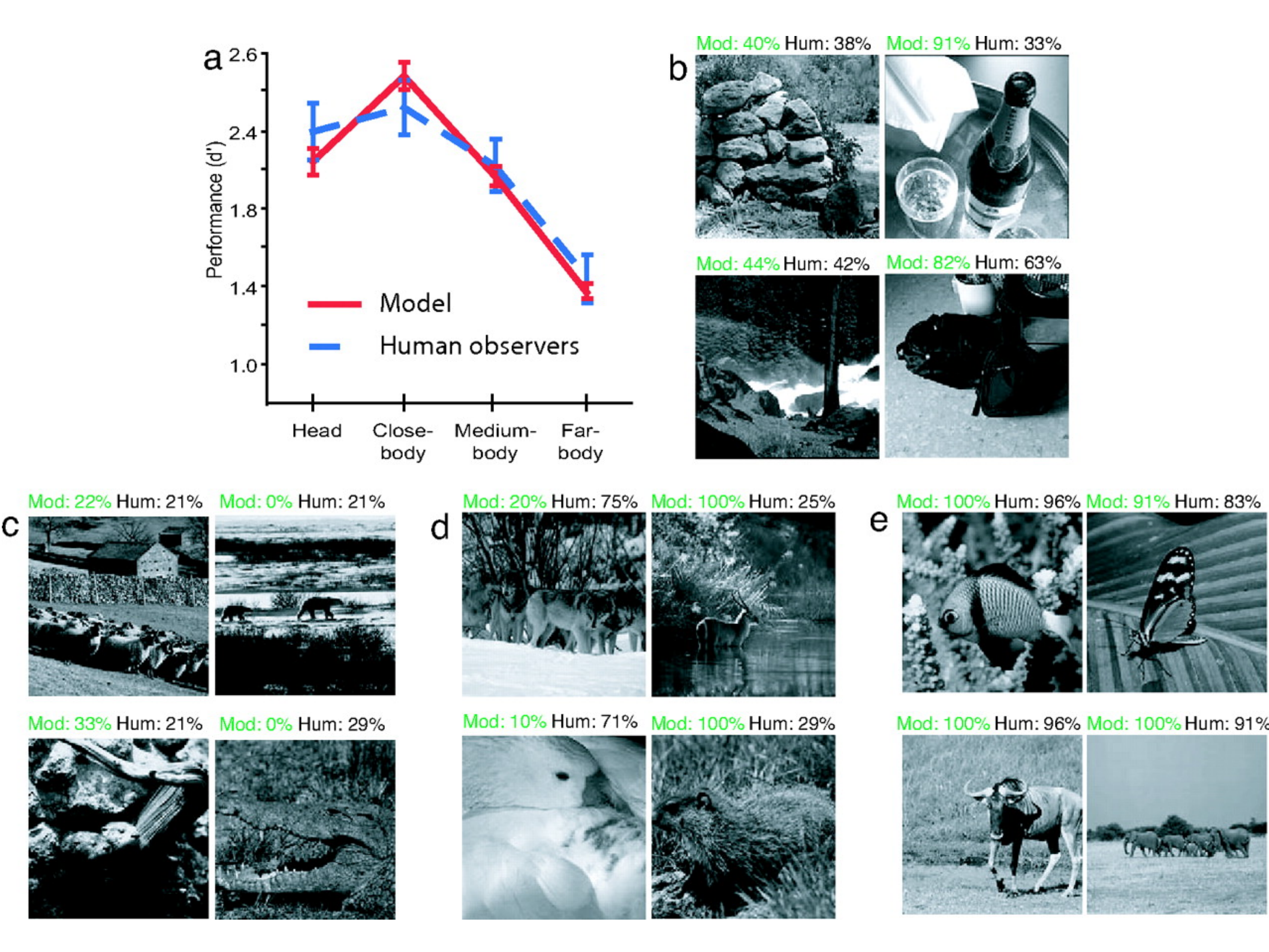


S1 Units

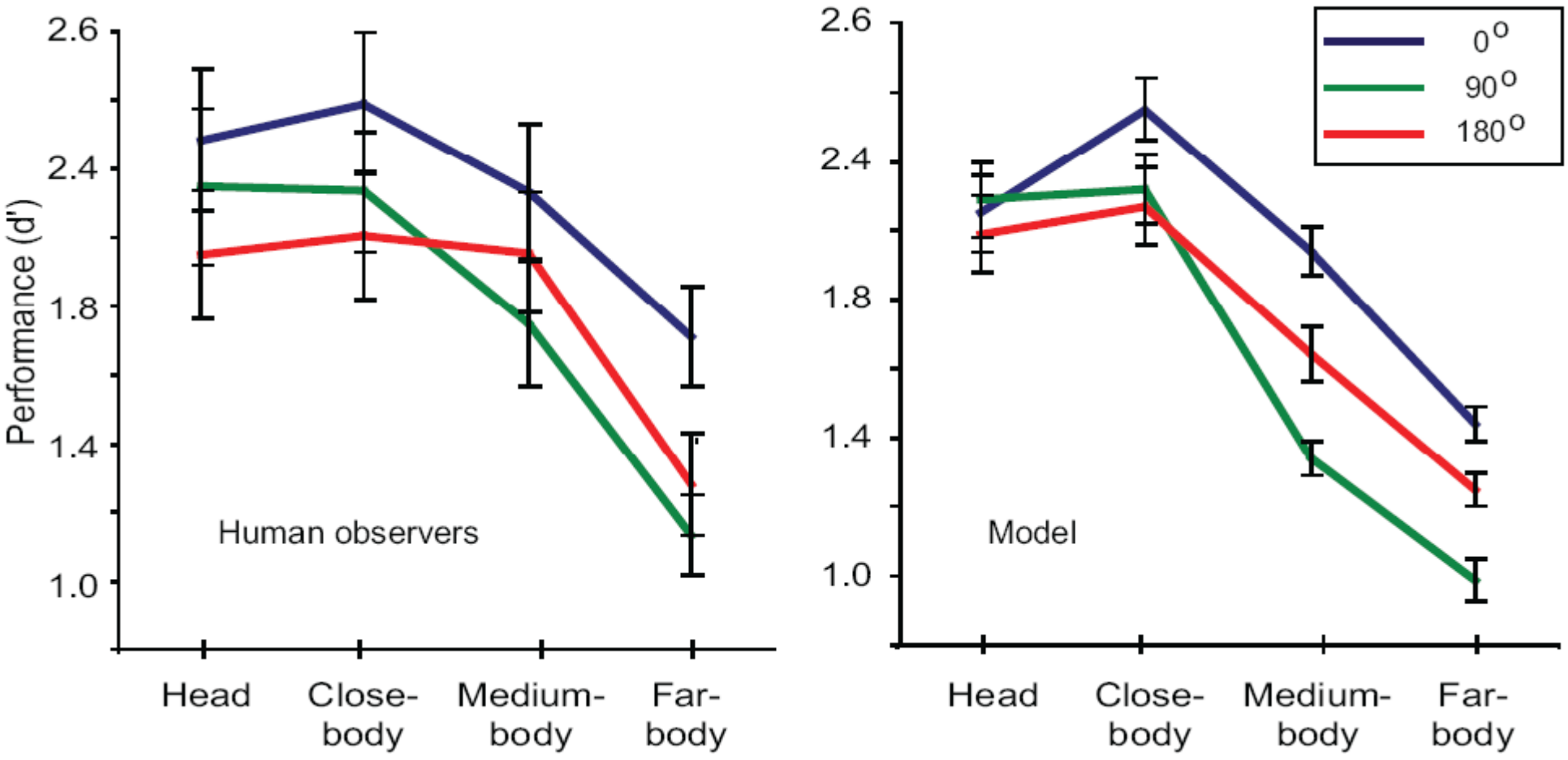
2 phases
4 orientations
17 sizes (15 shown)

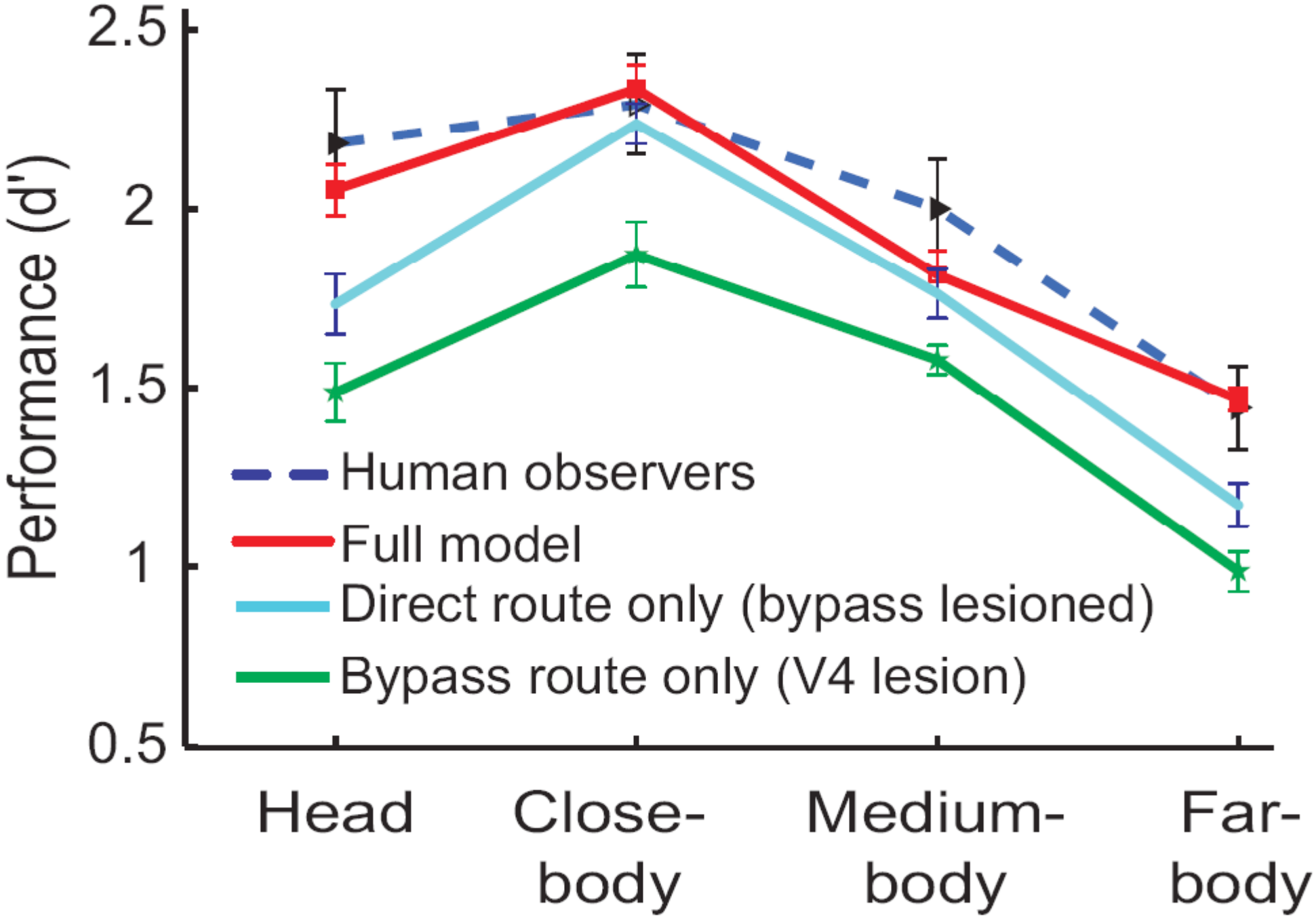



C2
1.1° - 3.0°
MAX
S2
0.6°-2.4°
TUNING
ΔN S2
ΔN S2
C1
0.4°-1.6°
MAX
ΔN S C1
ΔN S C1
ΔS
S1
0.2°-1.1°
TUNING
2° visual angle


a
2.6
2.4
1.8
1.4
1.0
Performance (d')
Model
Human observers
Head
Close-body
Medium-body
Far-body
b
Mod: 40% Hum: 38%
Mod: 91% Hum: 33%
Mod: 44% Hum: 42%
Mod: 82% Hum: 63%
c
Mod: 22% Hum: 21%
Mod: 0% Hum: 21%
Mod: 33% Hum: 21%
Mod: 0% Hum: 29%
d
Mod: 20% Hum: 75%
Mod: 100% Hum: 25%
Mod: 10% Hum: 71%
Mod: 100% Hum: 29%
e
Mod: 100% Hum: 96%
Mod: 91% Hum: 83%
Mod: 100% Hum: 96%
Mod: 100% Hum: 91%

Recognition Under Rotation




Performance (d')
2.5
2
1.5
1
0.5
Human observers
Full model
Direct route only (bypass lesioned)
Bypass route only (V4 lesion)
Head
Close-body
Medium-body
Far-body