

Attention and consciousness

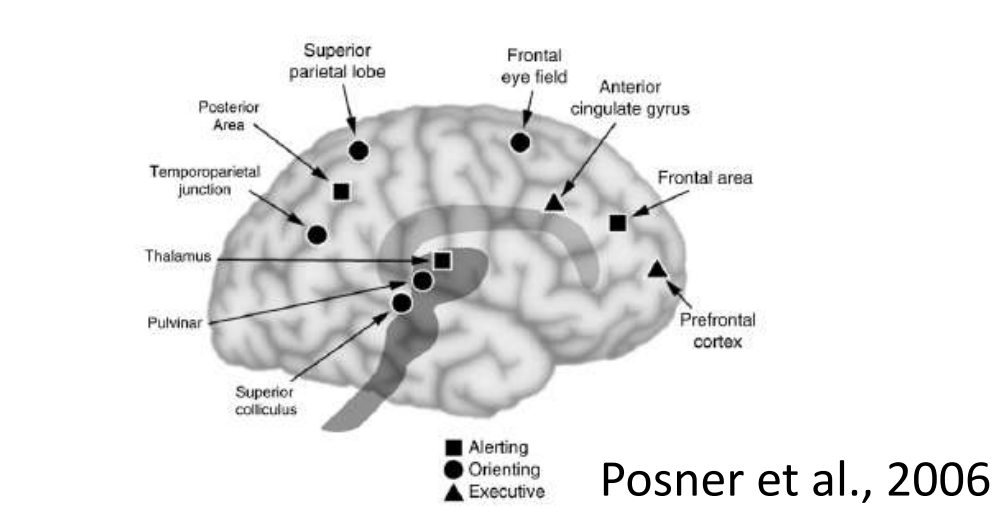
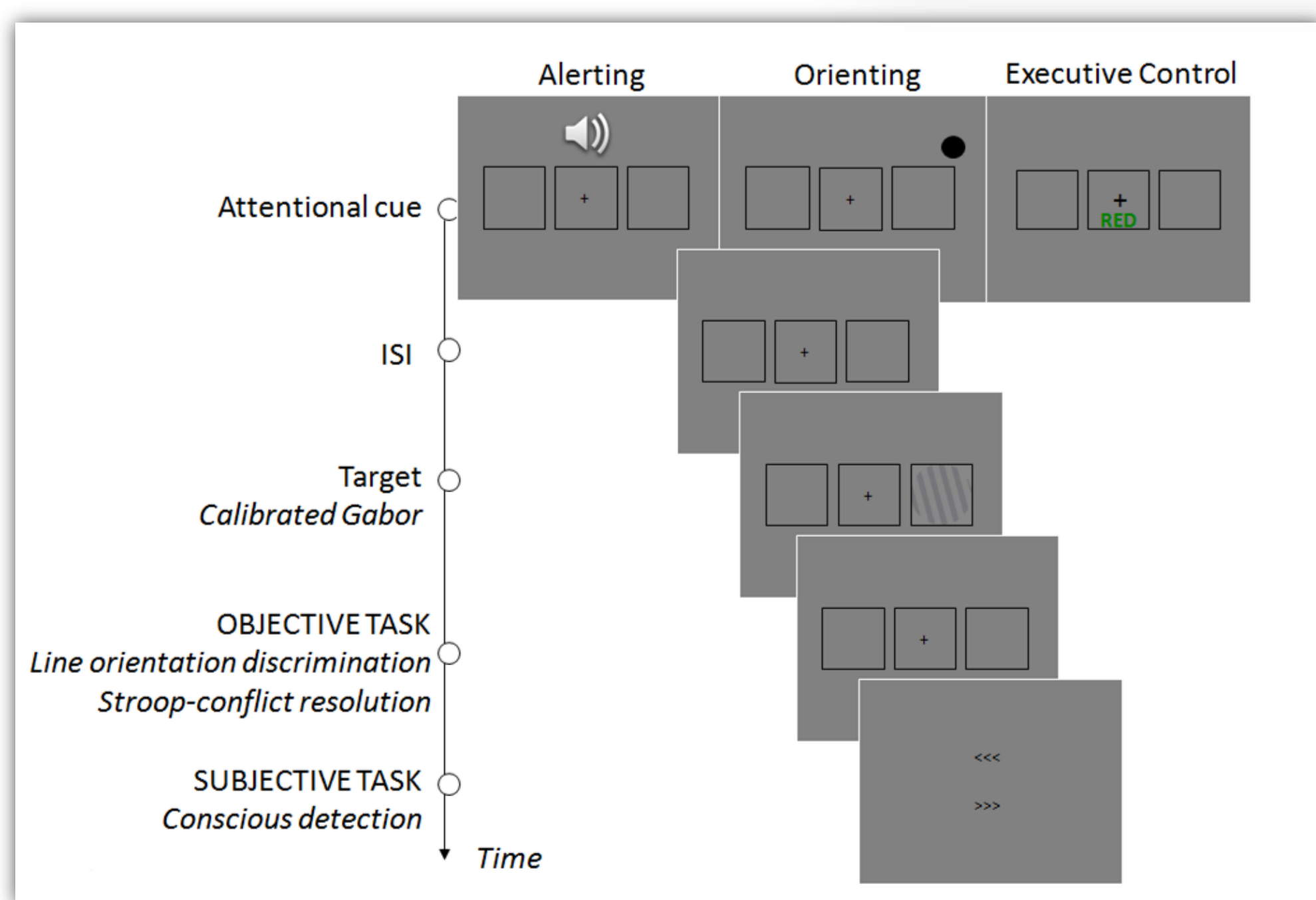
Attentional routes to conscious perception

Ana B. Chica^{1,2} and Paolo Bartolomeo^{1,3,4}*

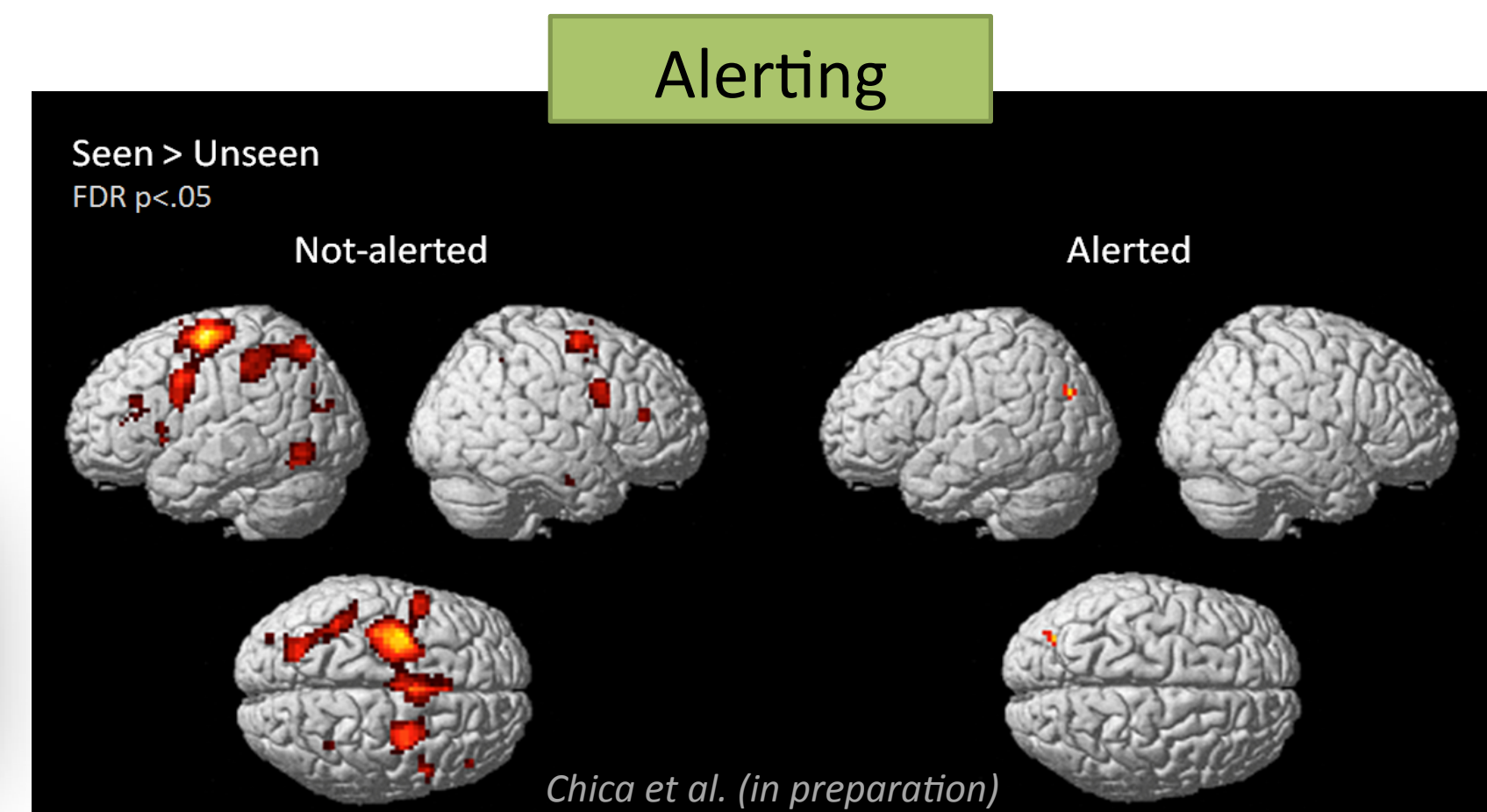
Cerebral Cortex June 2011, 23:1259–1279
doi:10.1093/cercor/bhr187
Advance Access publication April 16, 2012

Neural Bases of the Interactions between Spatial Attention and Conscious Perception

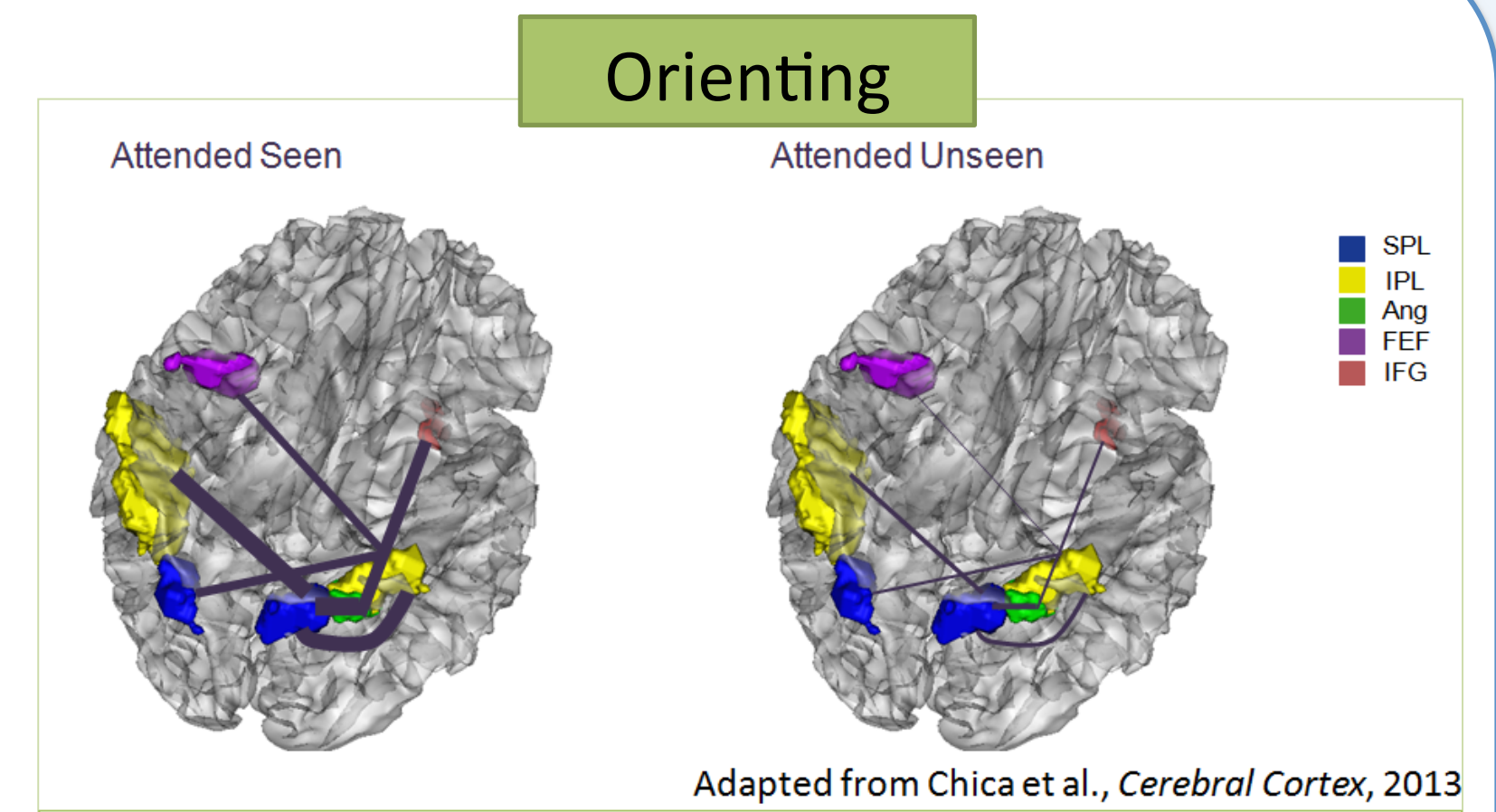
Ana B. Chica^{1,2}, Pedro M. Paz-Alonso³, Antoni Valero-Cabré^{5,6} and Paolo Bartolomeo^{1,7,8}



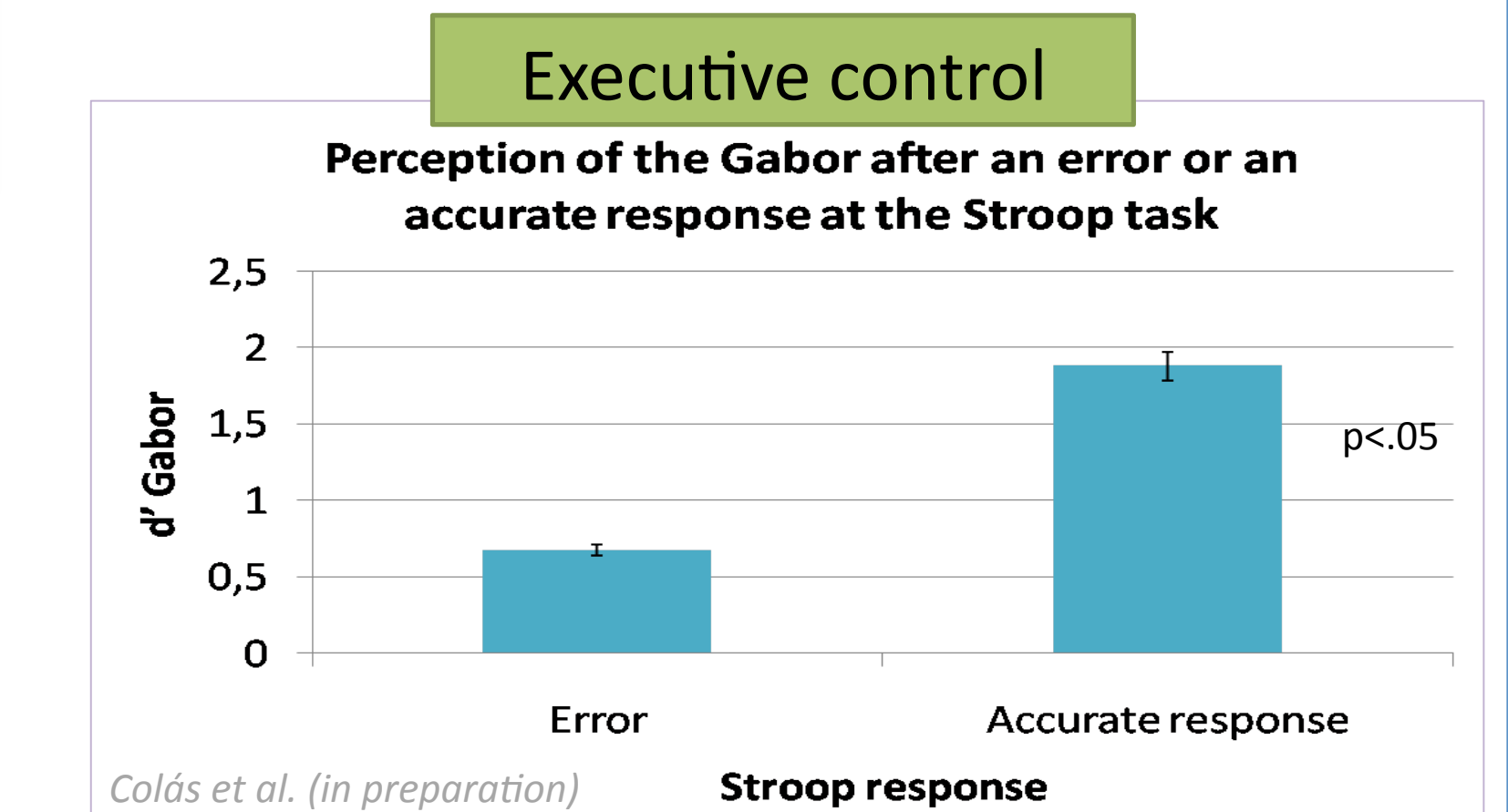
Influence of the three attentional networks (alerting, orienting and executive control) in conscious perception.



- When not alerted, a large fronto-parietal network is activated for information to reach consciousness.
- When alerted, only activity in circumscribed occipital areas and the thalamus (not shown) differentiates conscious and unconscious states.



Orienting exogenous attention modulates conscious perception, which is correlated with activity in a distributed fronto-parietal network.

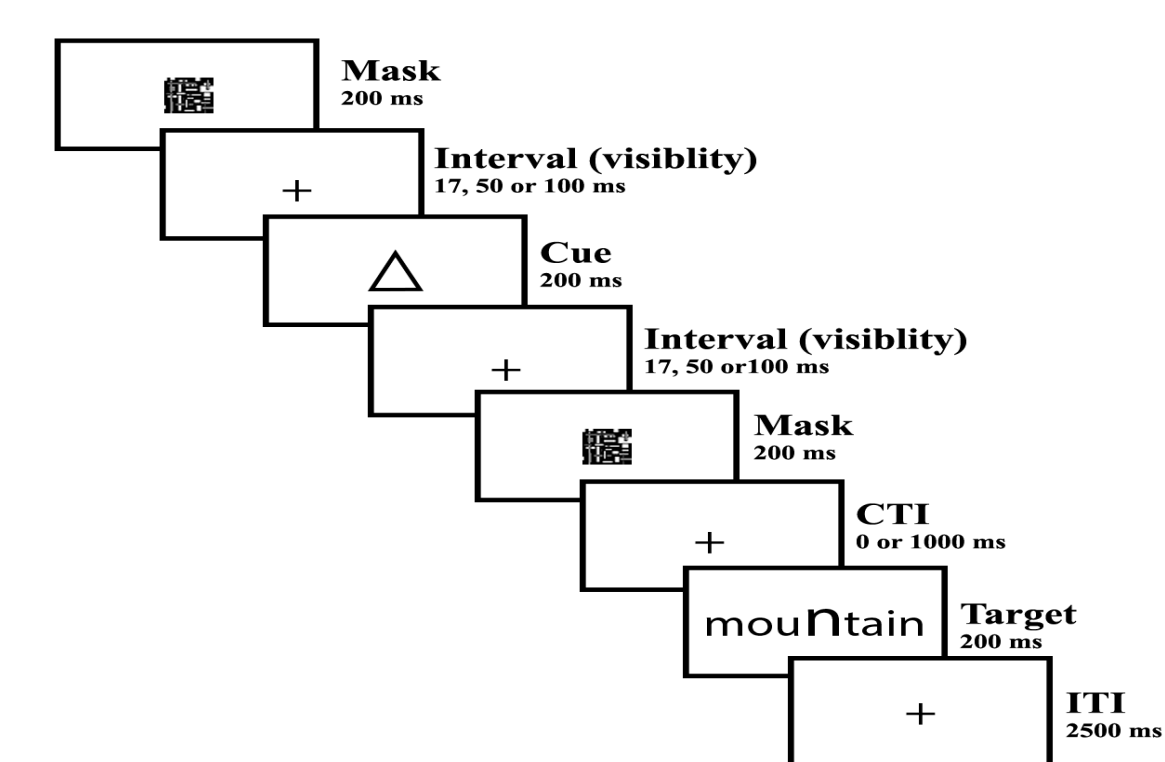


Committing or detecting an error impairs conscious perception as a form of conflict.

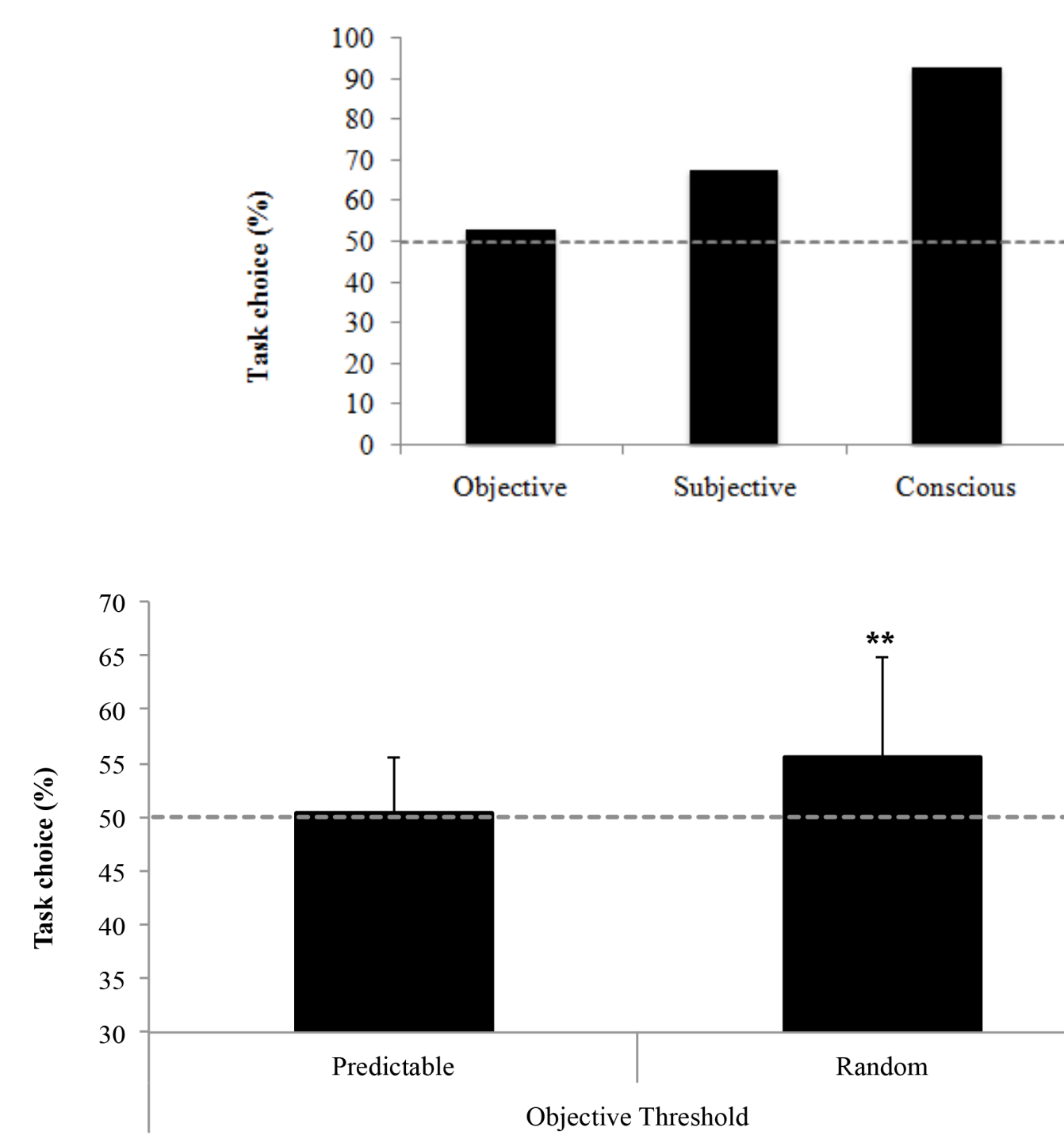
Future research

Does frontal damage alter conscious perception as predicted by theoretical models?

Does unconscious information influence human decision-making?

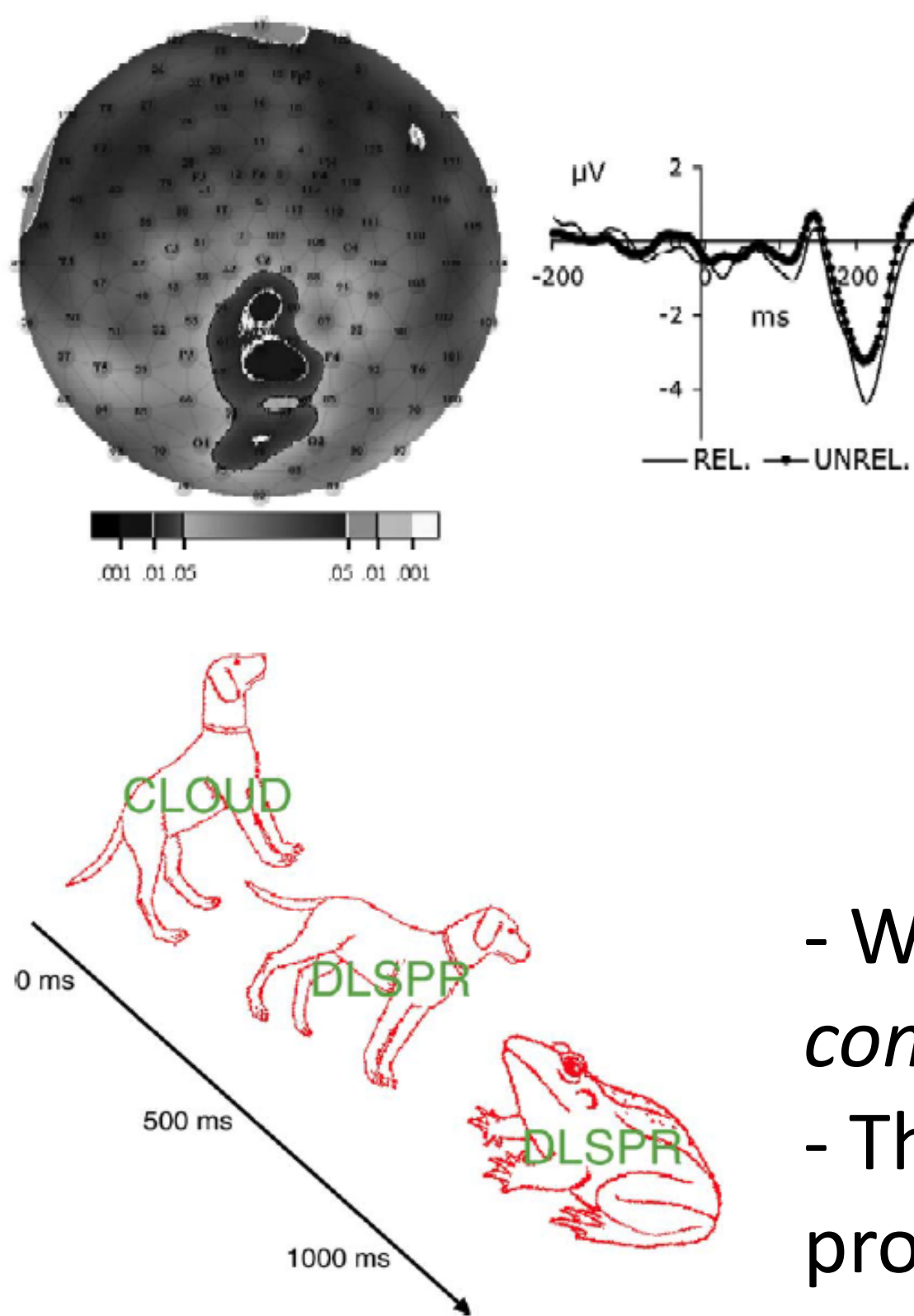


- Even under strict visibility conditions, unconscious information significantly biases binary decisions.
- This influence only takes place when an adequate setting is set consciously.



González-García, Tudela & Ruz, submitted

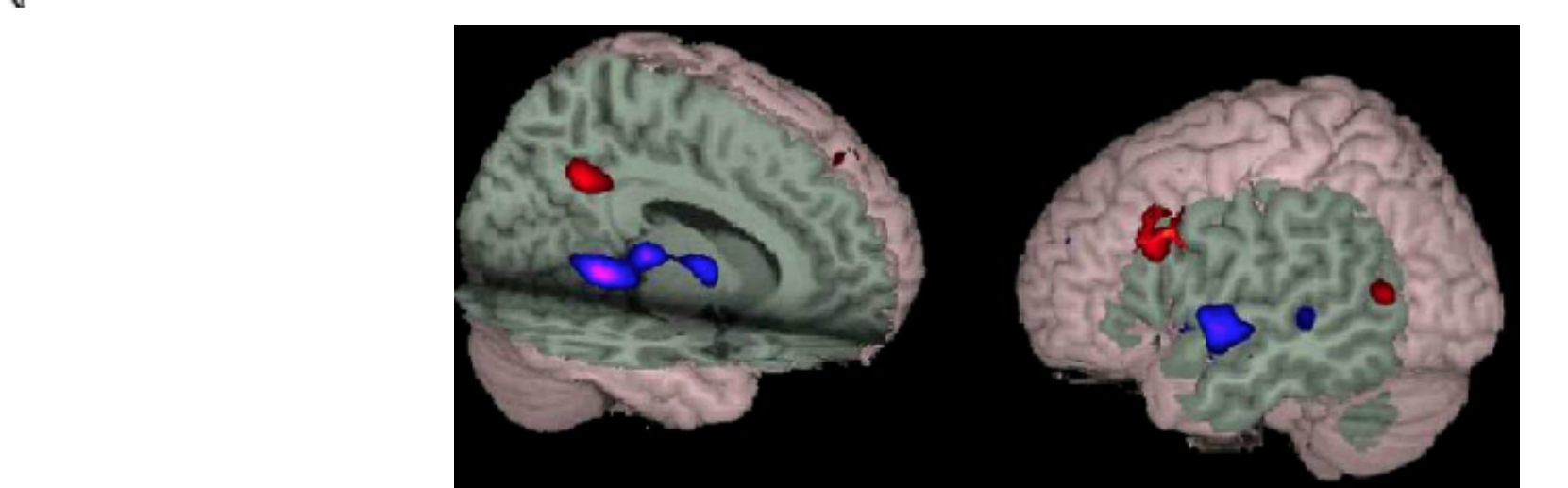
Does unconscious information activate semantic representations?



Research report
Cognitive Brain Research 17 (2003) 719–731

ity ERP indices of conscious and unconscious semantic priming

María Ruz^{a,*}, Eduardo Madrid, Juan Lupiáñez, Pío Tudela



- Two brain pathways for attended and ignored words
- María Ruz^{a,b,*}, Michael E. Wolmetz^a, Pío Tudela^b, and Bruce D. McCandliss^{a,*}
- Words presented at the *Objective Threshold of consciousness* generate semantic priming.
 - The attended vs. unattended nature of word processing biases the neural pathways involved.

Qualitative differences between implicit and explicit learning

SERIAL REACTION TIME TASK

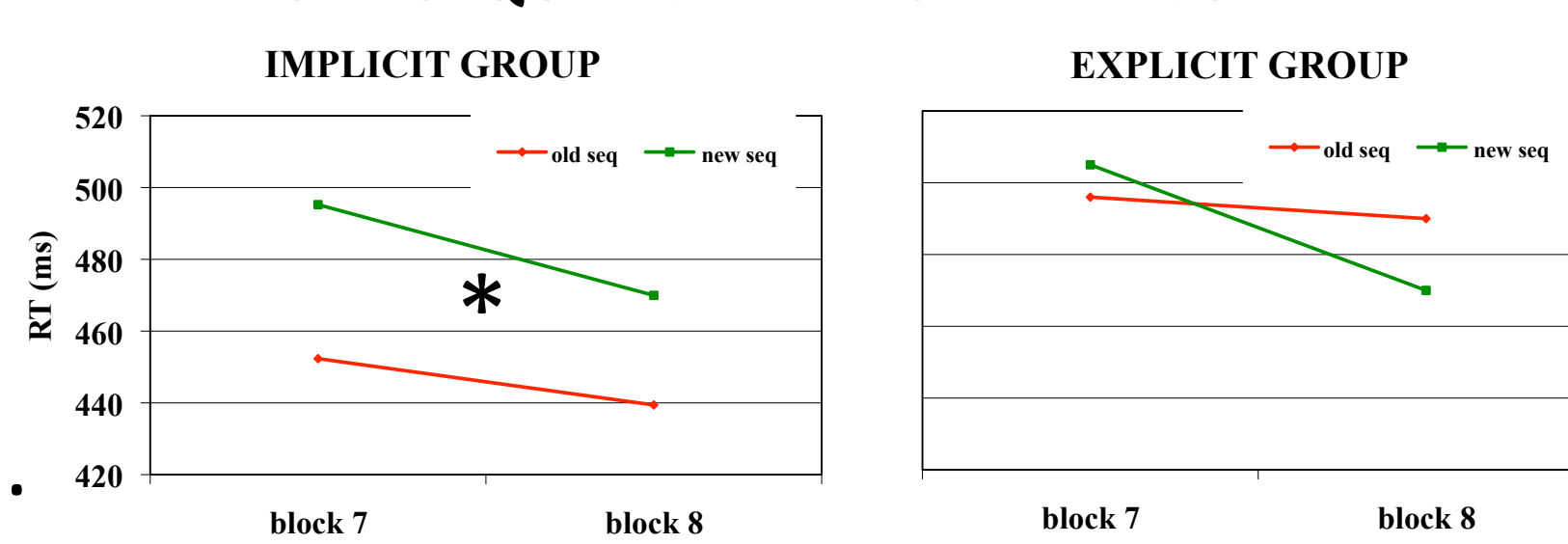
Unknown to the participants the series of locations follows a regular sequence:

Sequence: 213423143241

With practice, participants become progressively sensitive to this pattern.

SEQUENCE AWARENESS TEST: CUED GENERATION TASK

WHAT IF WHEN A NEW SEQUENCE IS INTRODUCED A FEW OLD SEQUENCE TRIALS ARE RECOVERED?



Implicit knowledge was triggered by subtle context details (a few old sequence trials).

Explicit learners noticed the sequence change and the expression of their learning was not context dependent.

"To locate the 'O' in the probe display as quickly as possible"

CONTINGENCY

75%: Location-repeat X/O (LR) 25%: Location change (LCH)

Contingency awareness

"Did you use the first display to predict the location of the target in the second display?"

"Where did the implicit learning go?"

- Block 1: 48 trials with 25% LR trials and 75% LCH trials.
- Block 2: 144 trials with 75% LR trials and 25% LCH trials.
- Unaware participants showed a smaller IOR effect in the first block than in the second block (-46 ms vs. -22 ms).

Attention, Awareness of Contingencies, and Control in Spatial Localization: A Qualitative Difference Approach

Joaquín M. M. Vaquero, Universidad de Granada; Chris Fiasconi and Bruce Milliken, McMaster University

The qualitative difference method for distinguishing between aware and unaware processes was applied here to spatial priming tasks. Participants were asked simply to locate a target stimulus that appeared in one of four locations, and this target stimulus was preceded by a prime in one of the same four locations. The prime location predicted the location of the target with high probability ($p = .75$). Test primes and target stimuli occurred on a high-reward baseline (identity trials). Across 3 experiments, we showed repetitive costs in the absence of awareness of the contingency, and repetitive benefits in the presence of awareness of the contingency. These results were particularly clear in Experiment 3, in which awareness was defined by reference to self-reported awareness. *Keywords:* awareness

Awareness of the contingency allowed override automatic effects (IOR) that pushed performance in the opposite direction.

Implicit learning seems not to be strong enough to this aim.