

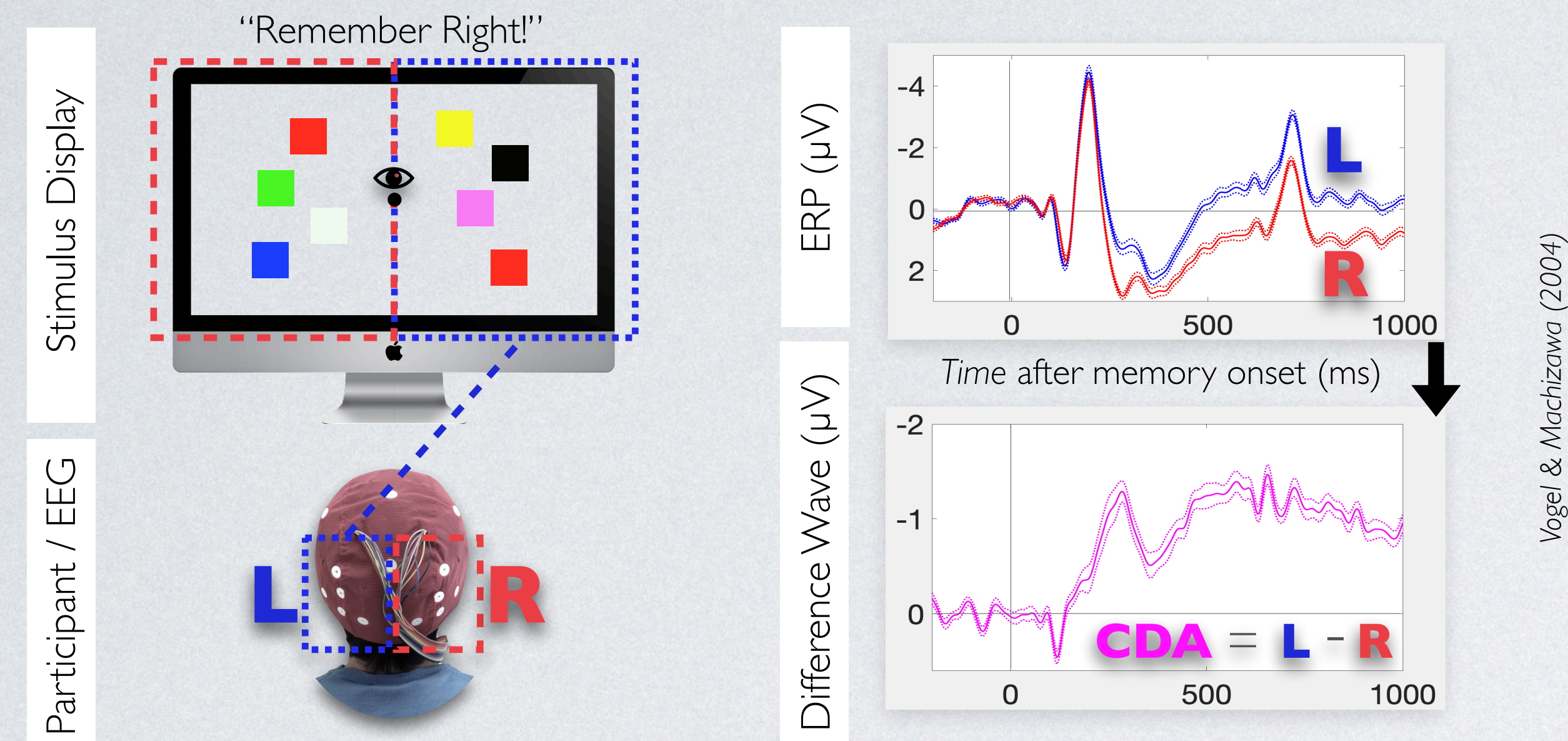
Dynamic Representations in Visual Working Memory?

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How do we keep track of visual information as it changes across time?

- **Visual Working Memory (VWM)** is a theoretical mental workspace where we represent a limited amount of visual information in an active state for a current task.
- **Contralateral Delay Activity (CDA)** is an event-related potential whose amplitude tracks the active capacity of VWM.



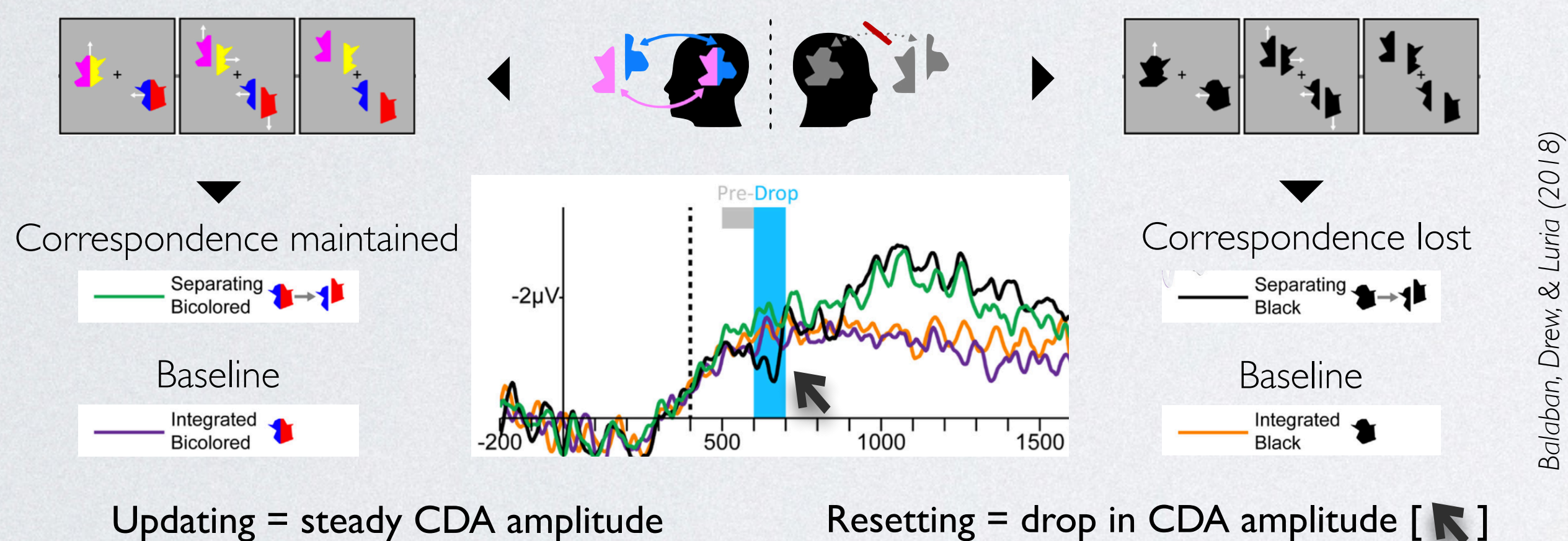
How are VWM representations modified?

Updating

Following stimulus change, VWM **amends** its existing representation of that stimulus to maintain correspondence.

Resetting

Following stimulus change, VWM **drops** its existing representation of that stimulus and re-encodes the changed stimulus to regain the lost correspondence.



- But previous demonstrations (polygon separation) of loss of stimulus-to-representation correspondence are confounded by change in # of stimuli & change in movement direction.

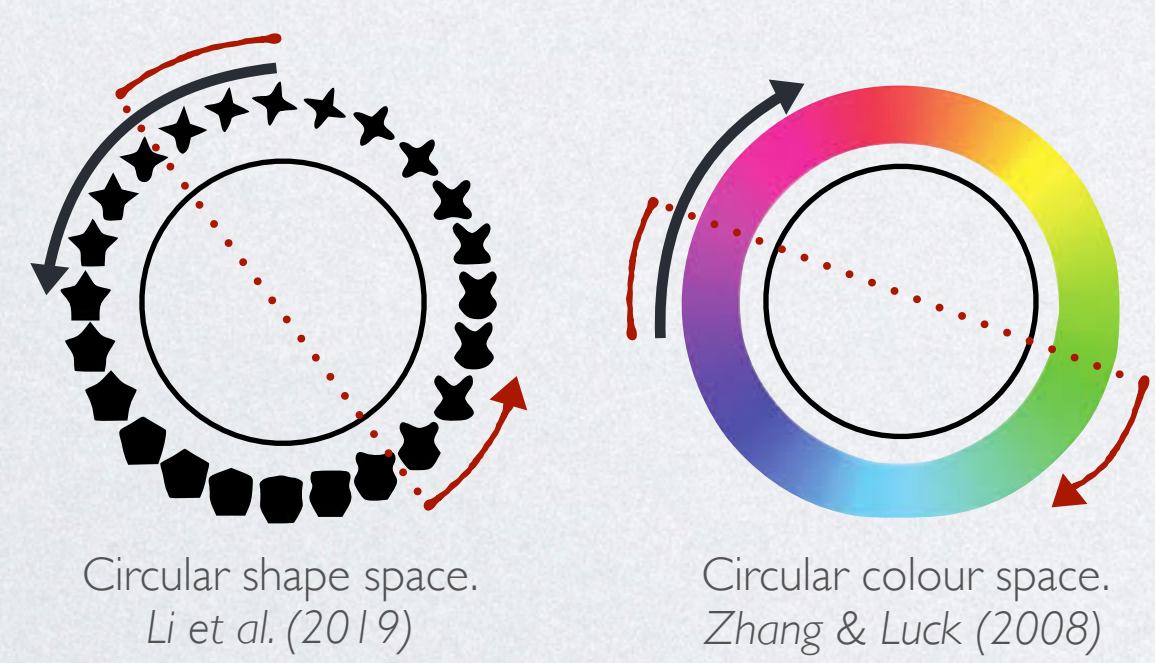
Discerning a loss of stimulus-to-representation correspondence using 2 types of change

Continuous Change:

- Gradual change of a stimulus along a circular stimulus space (correspondence maintained).

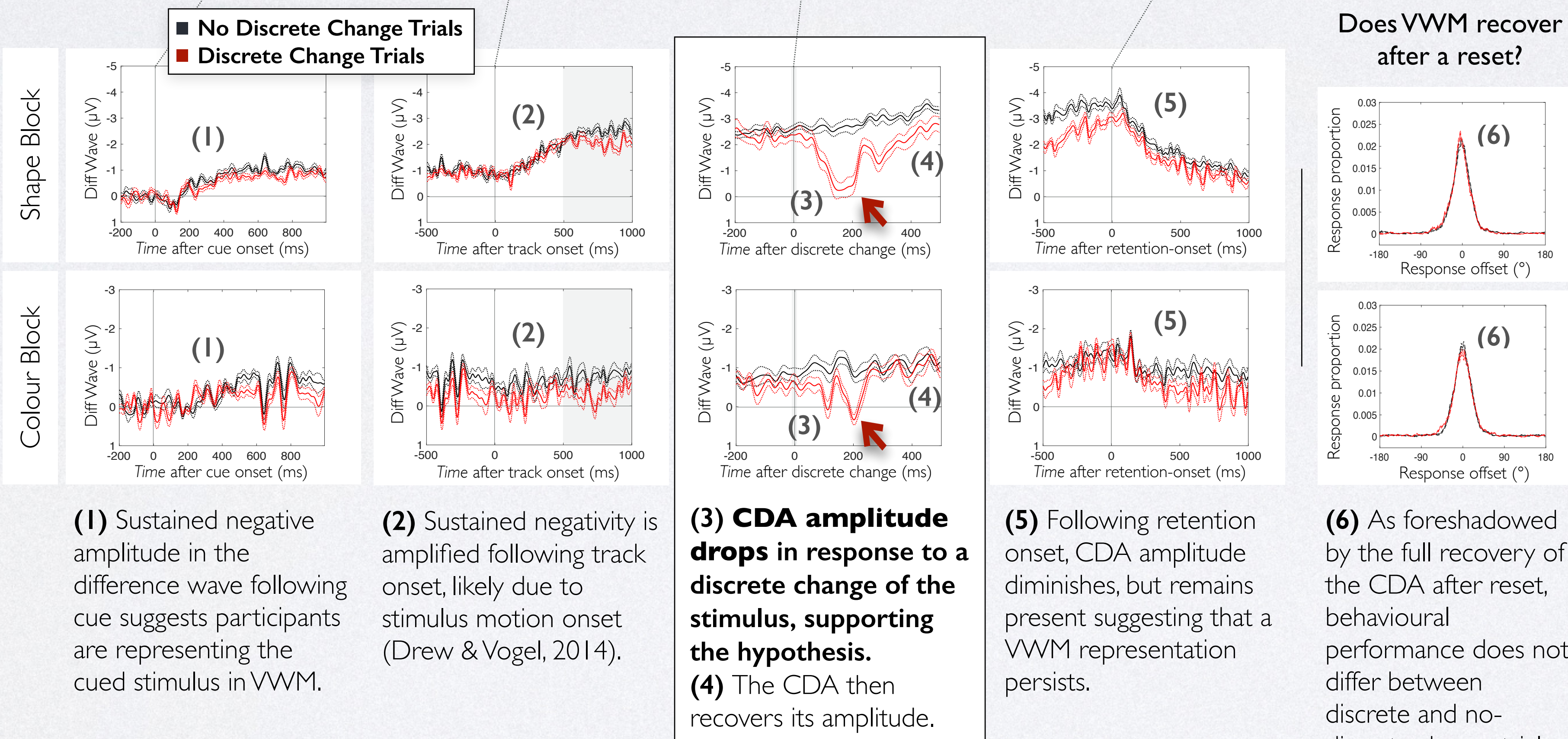
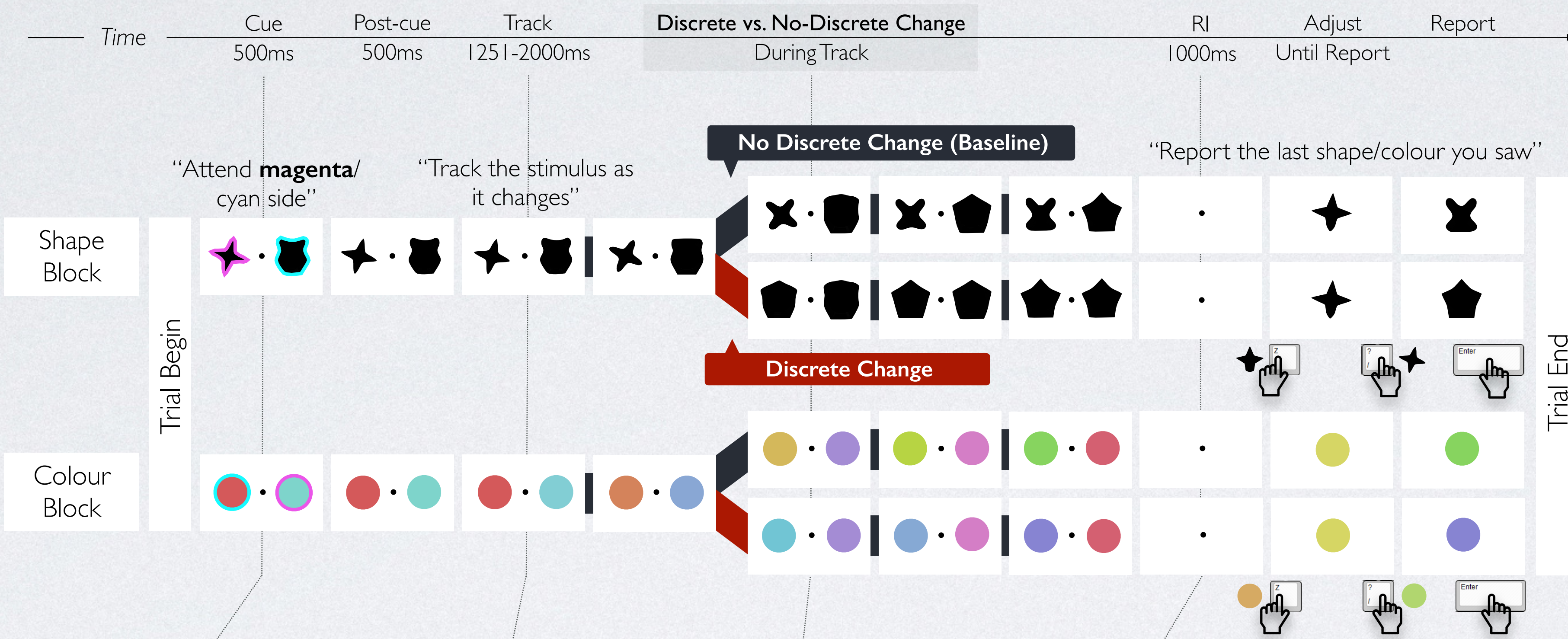
Discrete Change:

- Non-gradual change of a stimulus along a circular stimulus space (correspondence lost).



Exp 1 - Is a loss of stimulus-to-representation correspondence sufficient for VWM representations to reset?

- If VWM representations reset to a loss in stimulus-to-representation correspondence, then we should observe a **drop in CDA amplitude [R]** to a discrete change of a stimulus.

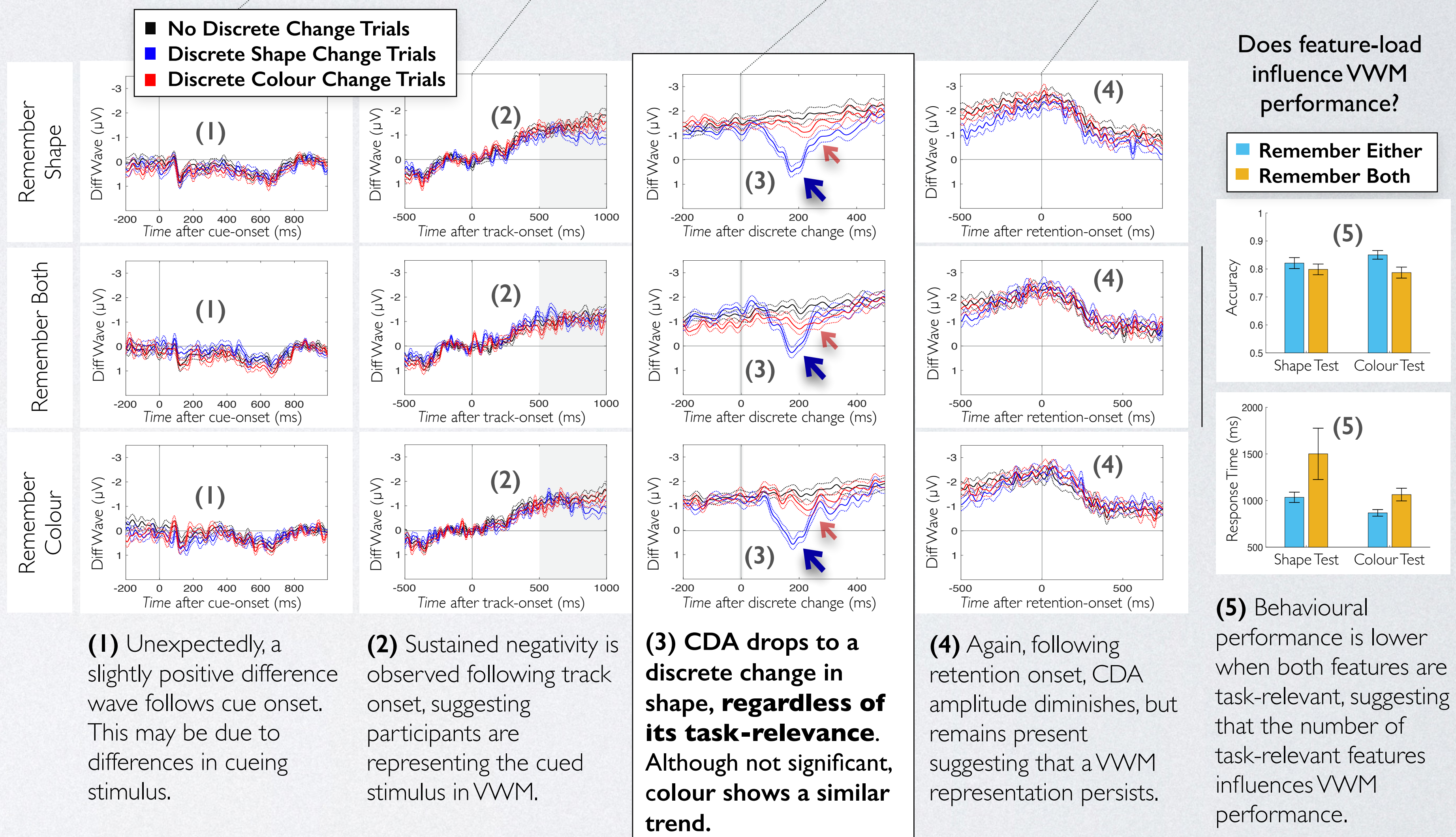
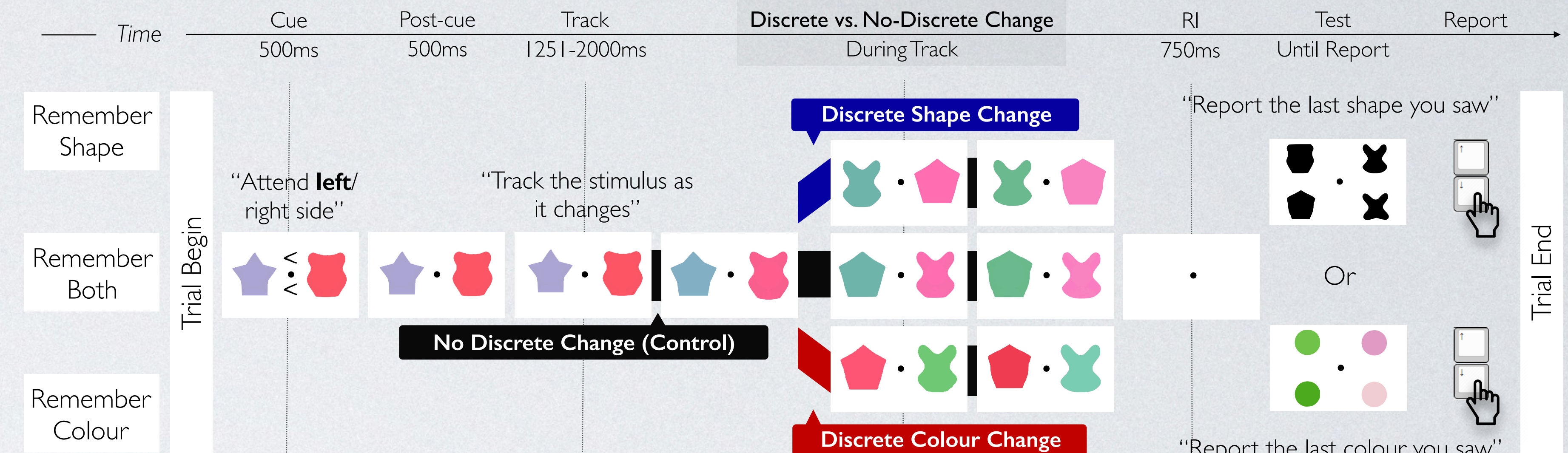


Exp 1 Discussion

- A loss of stimulus-to-representation correspondence alone is sufficient for VWM representations to reset.
- Maintained correspondence results in no resetting.
- **Overall, whether VWM updates or resets depends on stimulus-to-representation correspondence.**

Exp 2 - Is resetting caused by a lost correspondence in object-based representations?

- If VWM resetting reflects a lost correspondence in object-based representations, then we should observe a drop in CDA amplitude [R] to a discrete change in a feature of a stimulus, **regardless of its task-relevance**.



Exp 2 Discussion

- VWM resets following a discrete change in shape, irrespective of its task-relevance.
- Although not significant, a similar trend is observed following a discrete change in colour.
- **Overall, the CDA's sensitivity to task-irrelevant change in a stimulus suggests that the CDA codes for object-based representations.**

References

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