The effect of verbal instructions in contingency learning depends on the time available to process the cue: evidence in favor of associative models

Rafael Alonso-Bardón, David Luque, Francisco J. López .

University of Málaga, Spain; Institute for Biomedical Research of Málaga (IBIMA), Spain

Human contingency learning

- **Single process**

  – Propositions formation

    - Non automatic
    - Work memory dependent
    - Slow acting

- **Investigations**

  – Physiological measures

    (Lovibond 2003)

Human contingency learning

- ## Dual process

  – Error correction and spreading activation mechanism

  - Automatic
  - Work memory independent
  - Fast acting

- ## Investigations

  – SOA < 300 ms

  (Zeelenberg, Pecher and Raaijmakers, 2003)

- ## Associative repetition priming.

  (Morís, Cobos, Luque and López, 2012)

- Impact on the applied field.
  - Clinical Applications.

  - Treatment of anxiety disorders (phobias).

  - Extinction of the association of a stimulus with a dangerous situation or event.

The propositional approach predicts that learning will be affected by instruction. The automatic link-formation mechanism is non-propositional. It cannot, therefore, be affected directly by verbal instruction (Mitchell, De Hower and Lovivond, 2009).

The use of a SOA <300 ms has shown that prevents the operation of propositional processes.

PURPOSE

We tested if a change in cue-outcome contingencies could be modulated by instruction using a cued response task with a SOA of 250 ms.

Task

500 ms   500 ms   500 ms
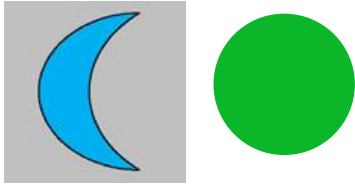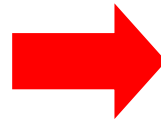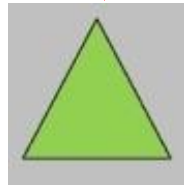

+   Feedback
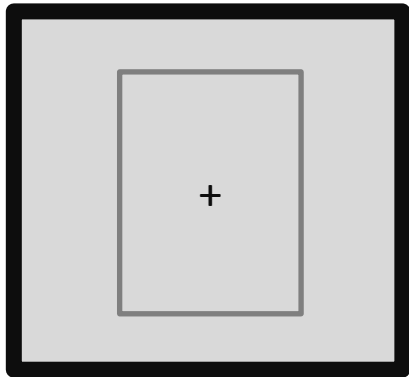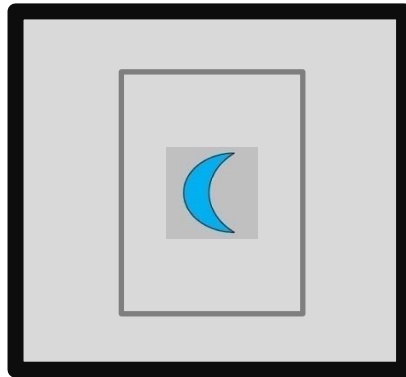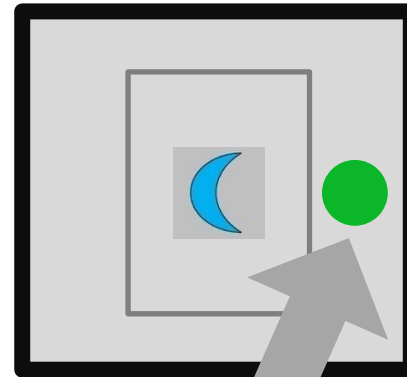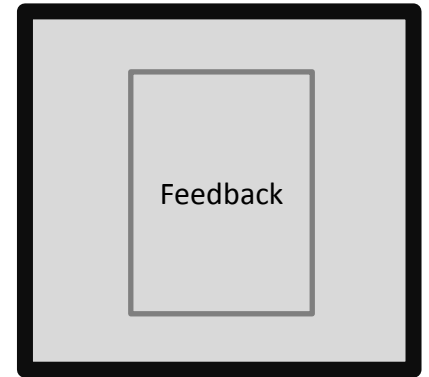
- Response: pressing as son as possible a key wich indicates the position of the outcome.
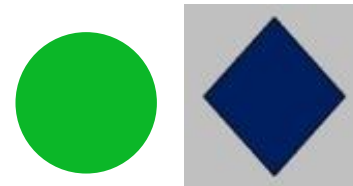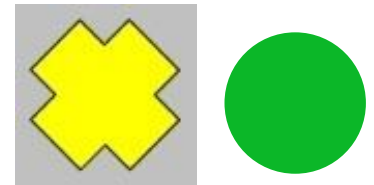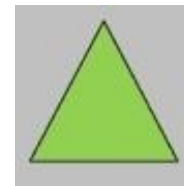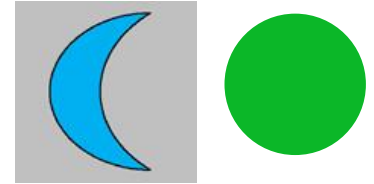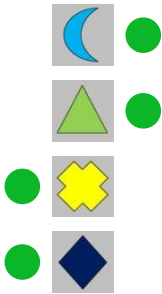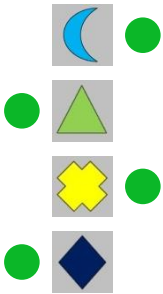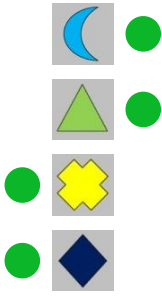
First Phase
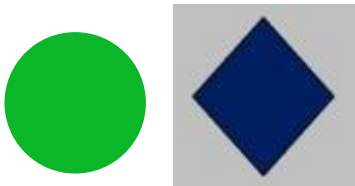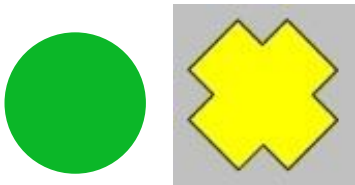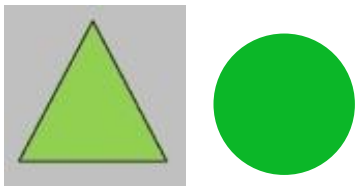
TEST

Second Phase

Instruction Phase
This cue changes the contingency
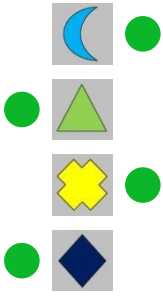
Design

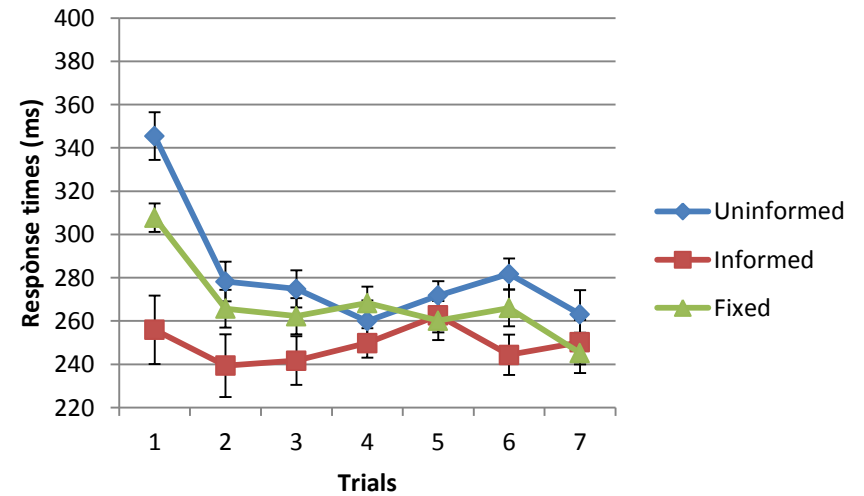| GROUP	FIRST LEARNIG PHASE 72 Trials	INSTRUCTION PHASE	SECOND LEARNIG PHASE 36 Trials
Long SOA (1500 ms)			
Short SOA (250 ms)			

Predictions

– Propositional approach:

- RTs Informed Stimulus = RTs No Change Stimulus

– Dual approach:

- RTs Informed Stimulus > RTs No Change Stimulus
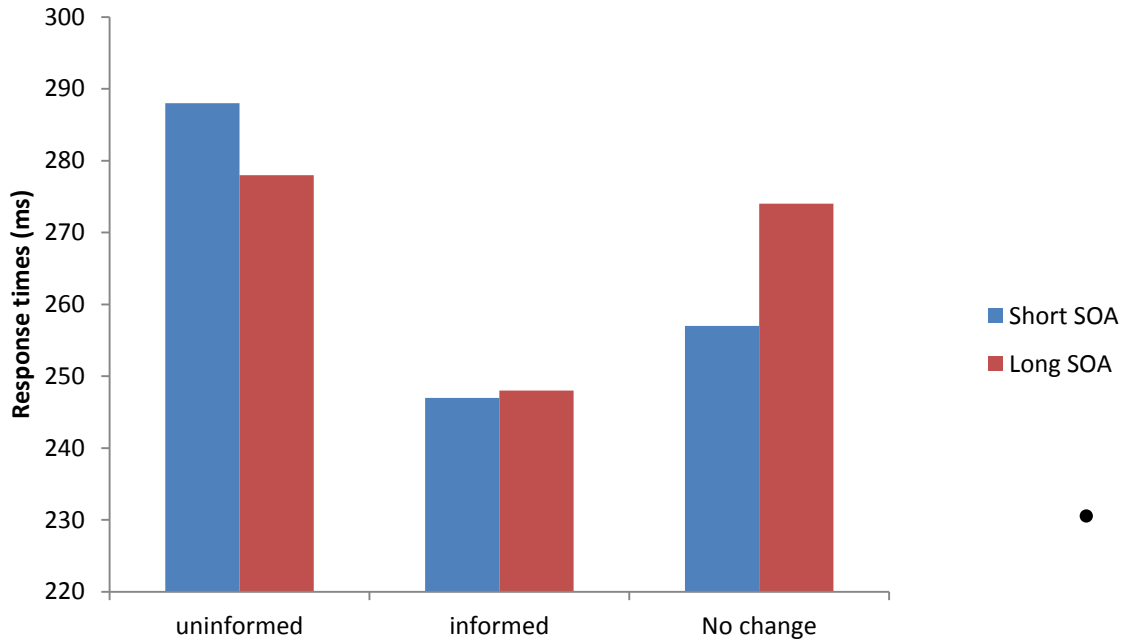
Results (F2)

Short SOA
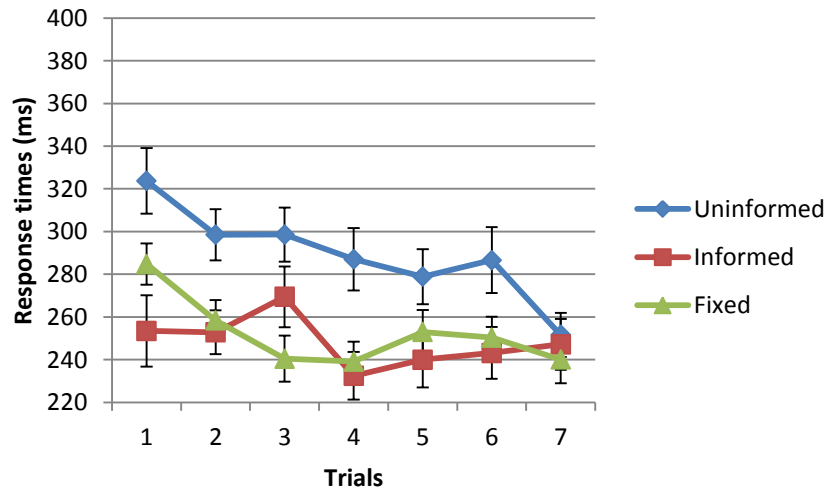
Long SOA

Results

- Short SOA:
  - No change < Uninformed
  - Informed=No change

- Long SOA:
  - No change=Uninformed
  - Informed<No change/ Uninformed

Cue x SOA: $F(2,166)=5.686$; $p.=.004$

Questions about the results

- Does this sensitive performance to a verbal instruction mean genuine knowledge update or, alternatively, fast responses to a verbal instruction that is active in working memory?

- If we use another instruction in working memory …

  What will happen with the Informed 1 stimulus?

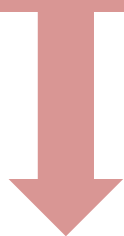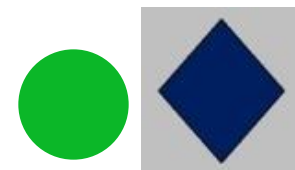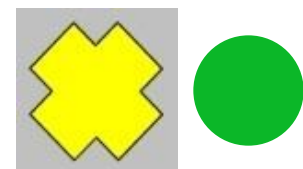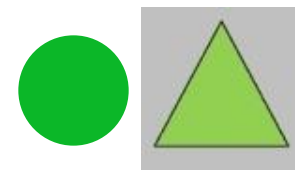Phase 1   Phase 2   Phase 3

Instruction 1

2 t

Instrucction 2
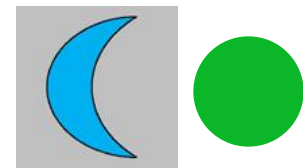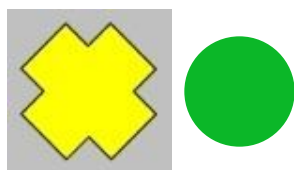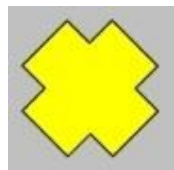
Predictions.

- Same than anterior

    - Propositional approach:
        - RTs Informed 1 Stimulus = RTs No Change Stimulus
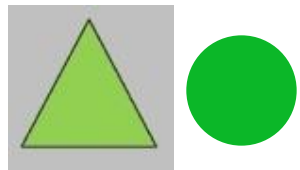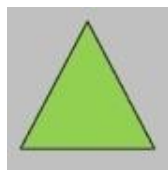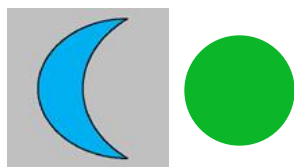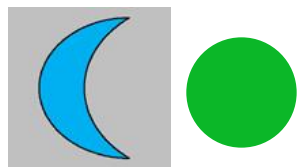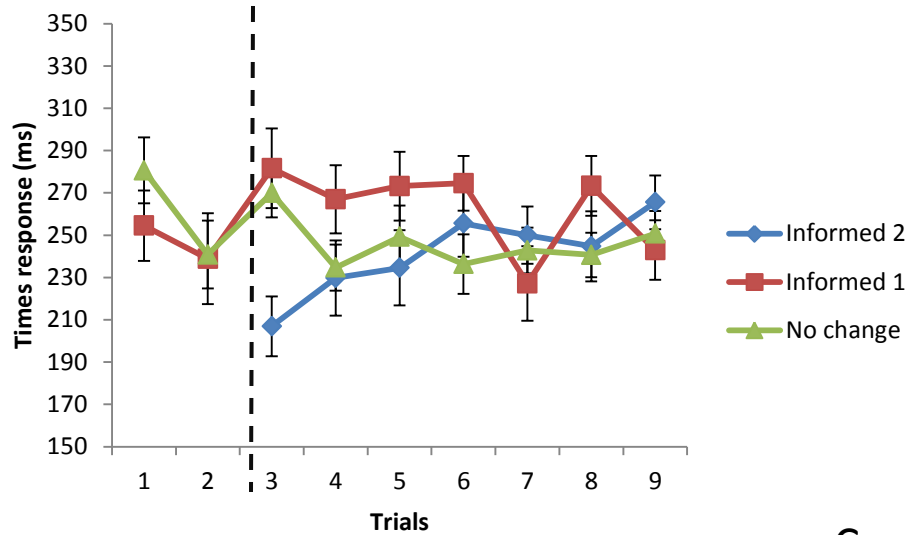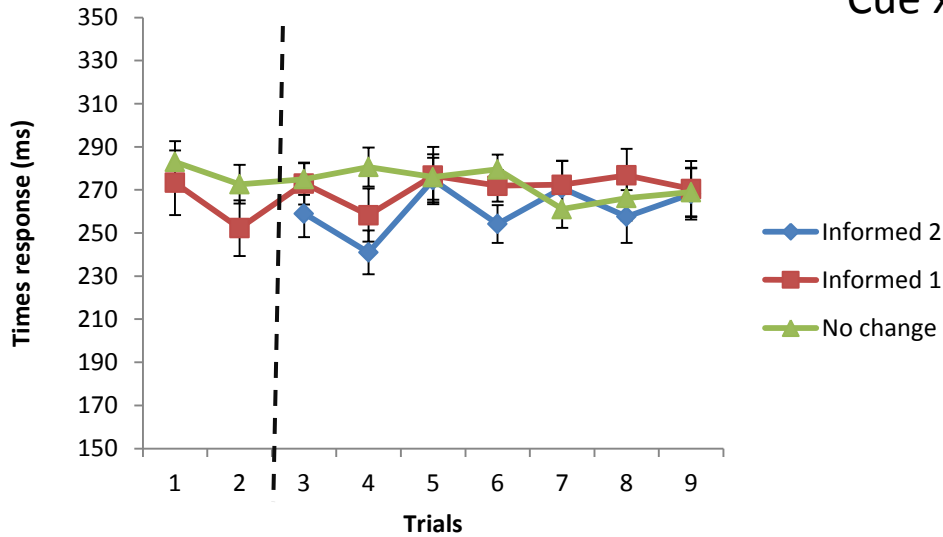
    - Dual approach:
        - RTs Informed 1 Stimulus > RTs No Change Stimulus

Results (F2-F3)

Inform. 1>No-chg.

Inform. 2<No-chg.

Cue x SOA x Trial: F(8,143)=2.789; p.=.007

Inform. 1=No-chg.

Inform. 2<No-chg.

Conclusions

- Increased in RTs of the Informed Stimulus 1 from F2 to F3 suggests that in experiment 1 low RTs in this stimulus is not reflecting that participants have learned, but simply that they have been able to follow an instruction to be had in working memory.

- It is difficult to explain the results from propositional proposal.

- The dismissal of associative processes processes in contingency learning tasks may be regarded as premature.

- These results do not contradict (are in line) with information from clinical practice, where experience for extinguishing an association is needed.

THE END