Cue duration modulates the effects produced by a change in cue-outcome contingencies.

Rafael Alonso-Bardón, David Luque y Francisco J. Lopez.

Departamento de Psicología Básica. Universidad de Málaga.

Instituto de Investigación Biomédica de Málaga (IBIMA).

Human contingency learning

- Single process
  - Proposition formation
    - Non automatic
    - Work memory dependent
    - Slow acting

- Dual process:

  +

  - Error correction and spreading activation mechanism
    - Automatic
    - Work memory independent
    - Fast acting

Work in parallel
Task dependent

Previous research…

- Verbal judgements
- Physiological measures
- Associative repetition priming

  (Morís, Cobos, Luque and Lopez, 2012)
- Cued response task.

  (Sternberg and McClelland, 2012)

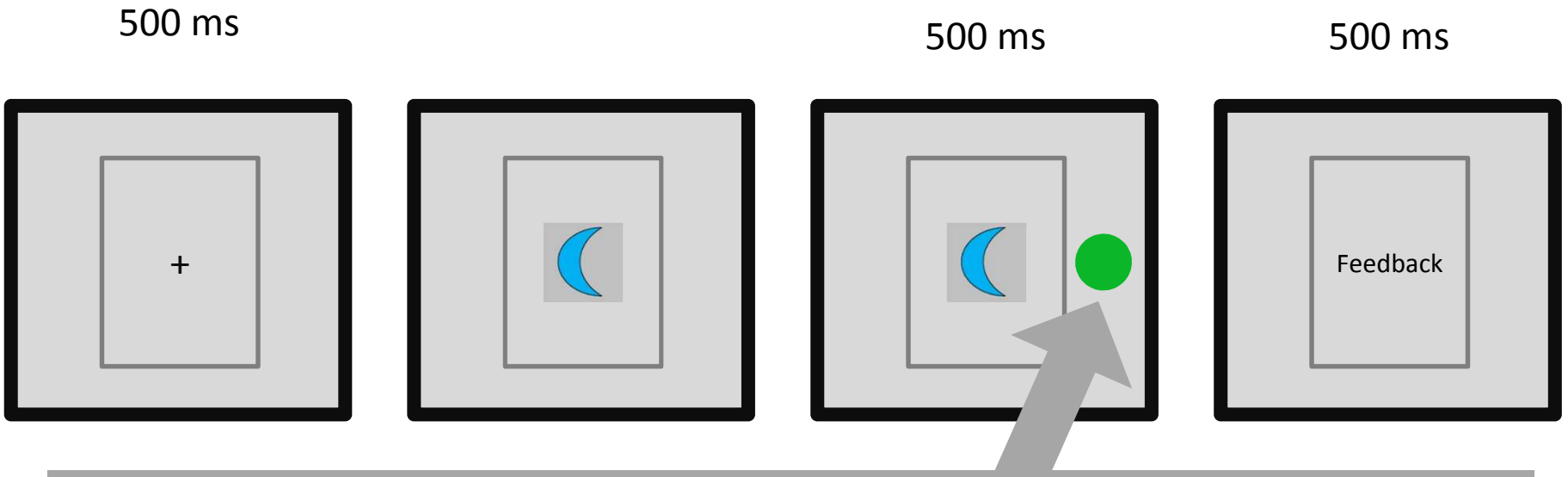
  – SOA< 300 ms

  (Zeelenberg, Pecher and Raaijmakers, 2003)

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

We tested if a change in cue-outcome contingencies could be modulated by instructions using a cued response task.

Task

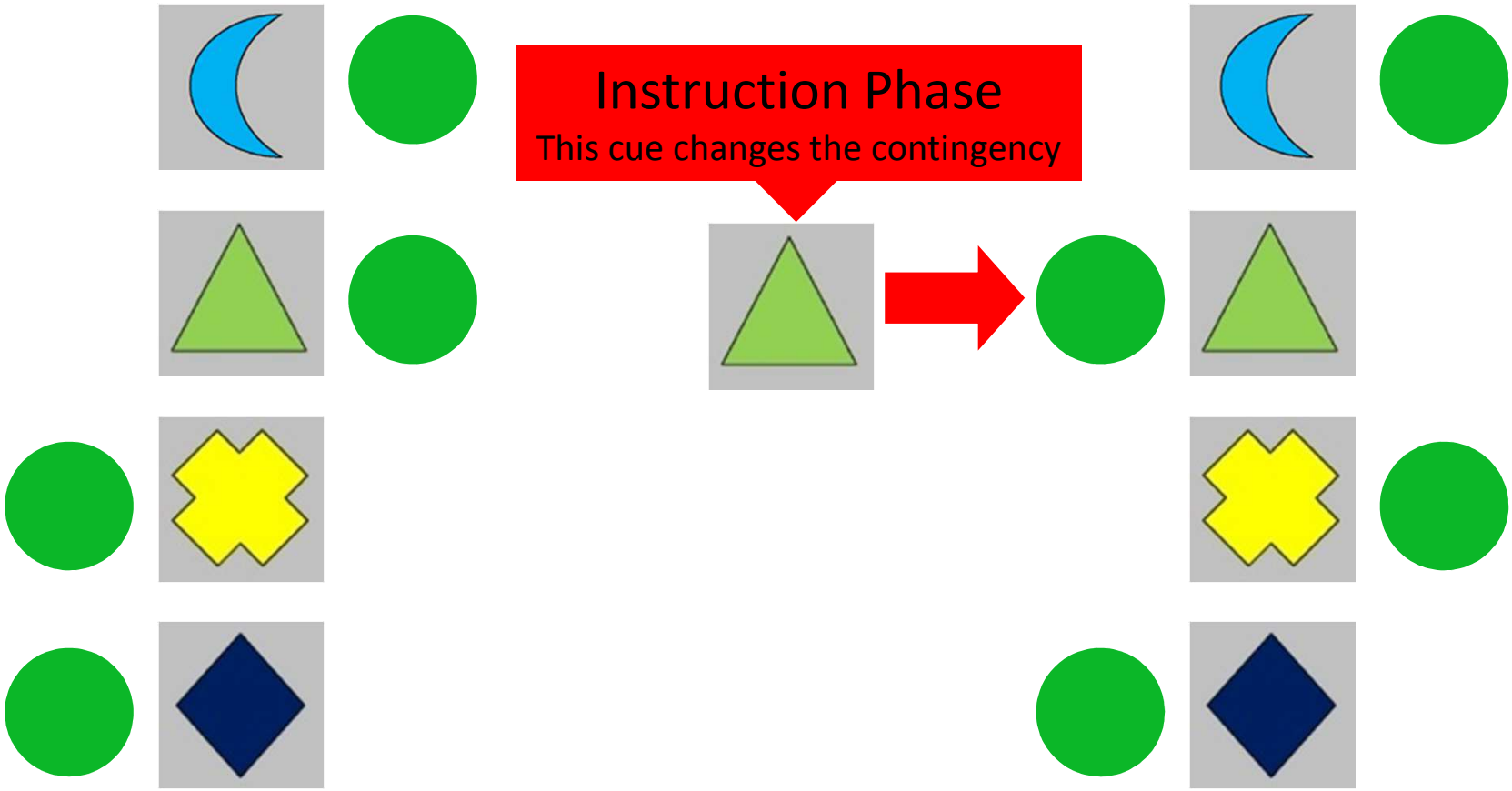


- Response: pressing as soon as possible a key which indicates the position of the outcome.

TEST

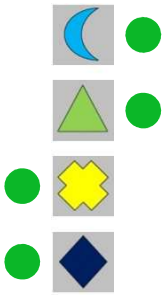
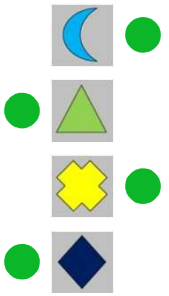
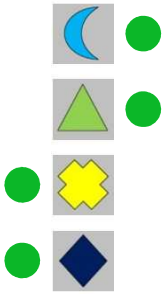
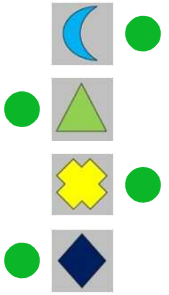
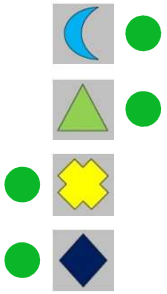
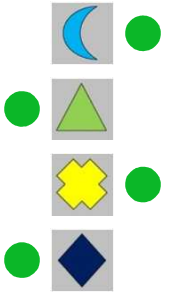
First Phase

Second Phase



Then, in the second phase we have three kinds of cues:
Fixed, Informed and Uninformed

Design

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

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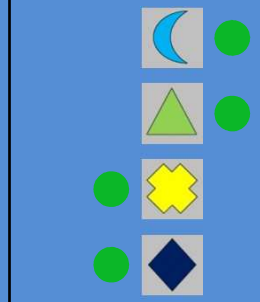
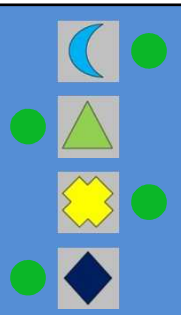
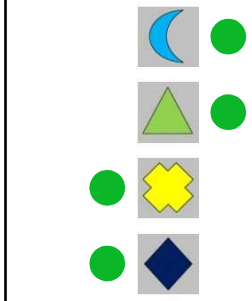
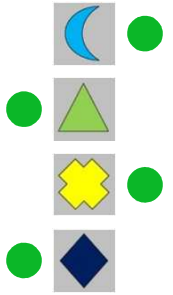
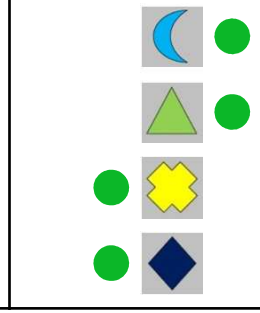
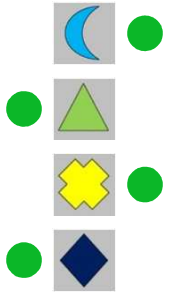
Long SOA (1500 ms)			
Short SOA (250 ms)			
Short-Long SOA			

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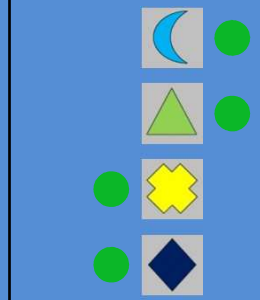
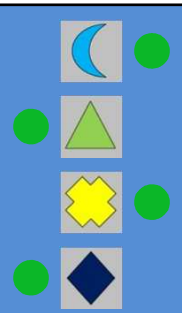
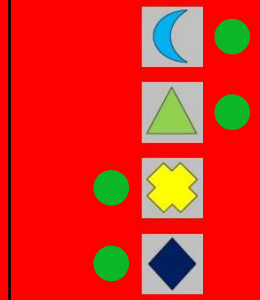
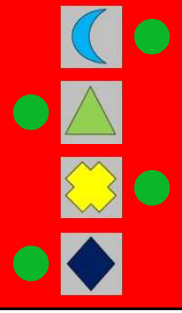
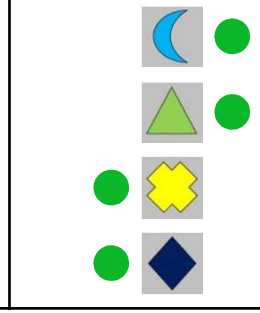
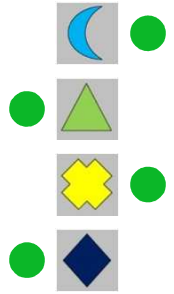
Long SOA (1500 ms)			
Short SOA (250 ms)			
Short-Long SOA			

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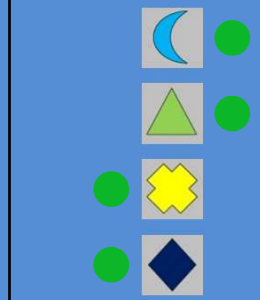
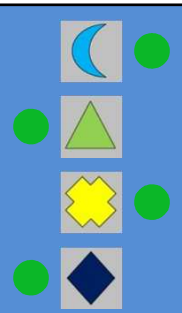
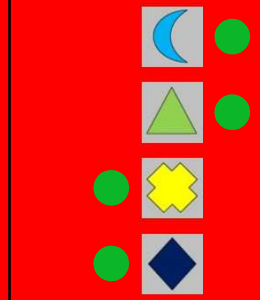
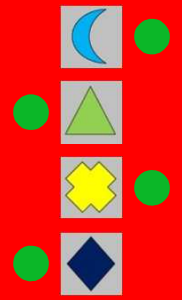
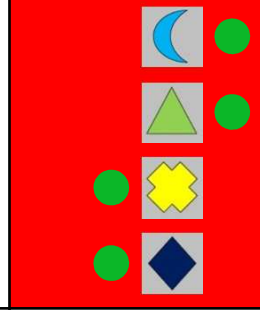
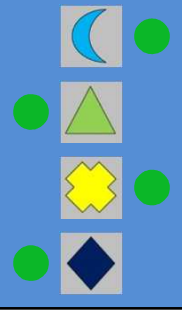
Long SOA (1500 ms)			
Short SOA (250 ms)			
Short-Long SOA			

Test predictions

	Informed cues			Uninformed cues		
	Short SOA Group	Long SOA Group	Short-long SOA Group	Short SOA Group	Long SOA Group	Short-Long SOA Group
PROPOSITIONAL	RTs = RTs Fixed			Few trials RTs > RTs Fixed		
DUAL PROCESS Work in paralel	RTs > RTs Fixed		RTs > RTs Fixed	RTs > RTs Fixed		RTs > RTs Fixed
DUAL PROCESS Task dependent	Rts > RTs Fixed		RTs = RTs Fixed	RTs > RTs Fixed		Few trials RTs > RTs Fixed

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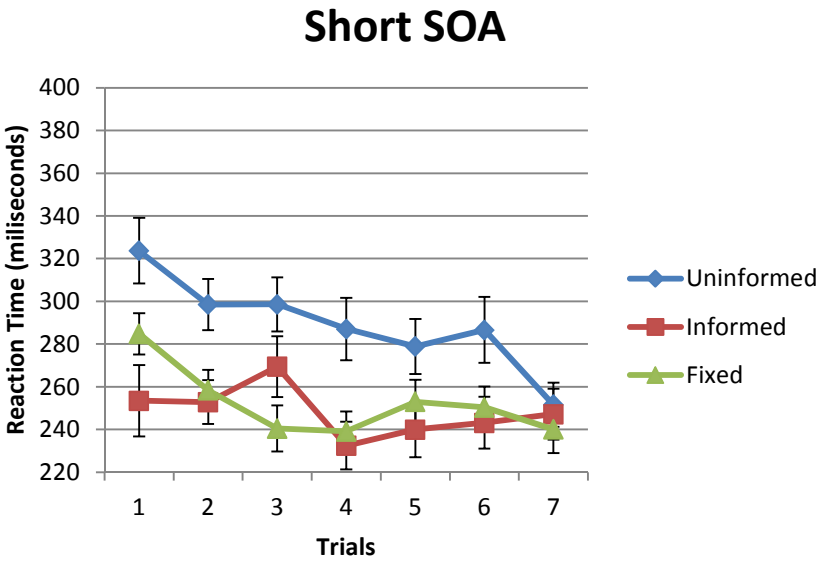
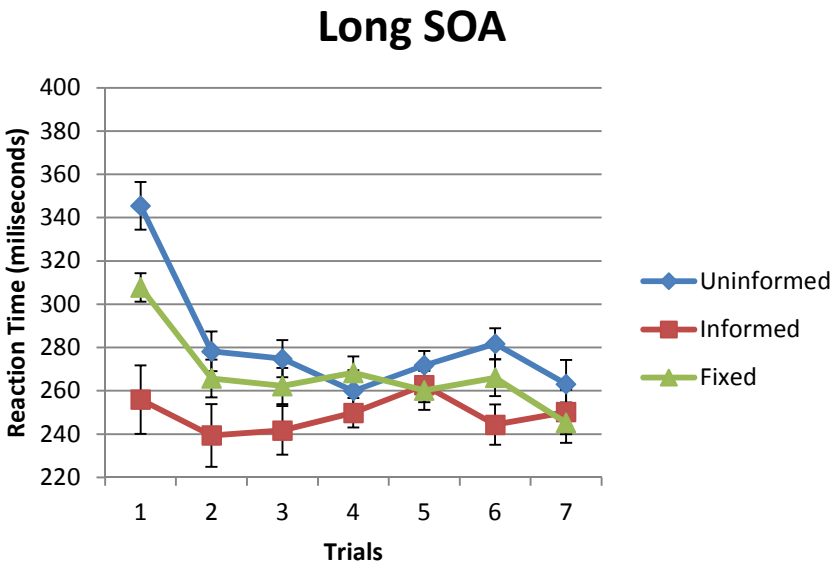
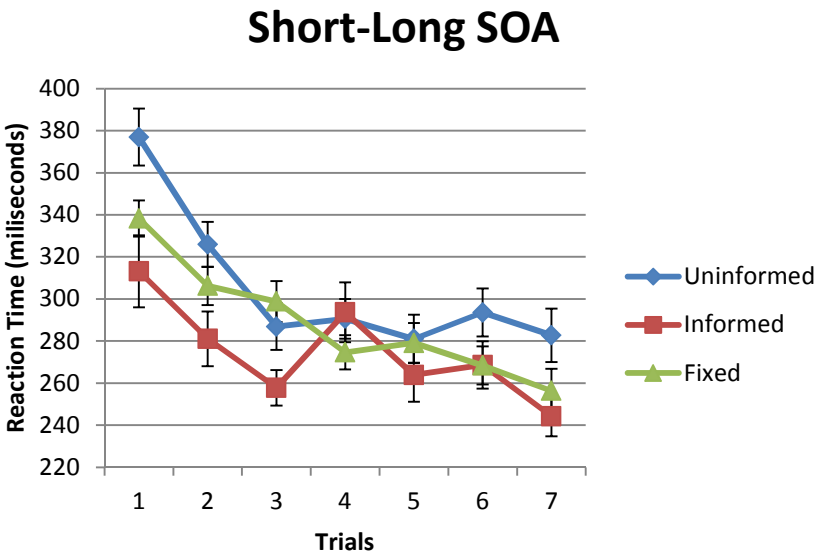
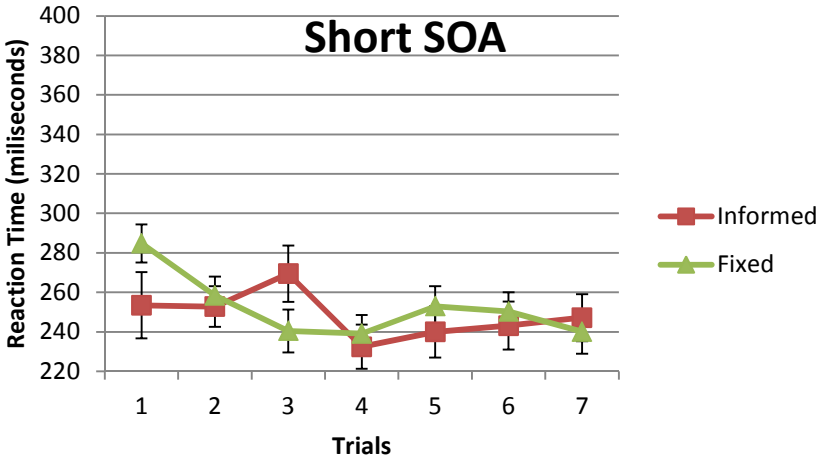
Test (second phase)

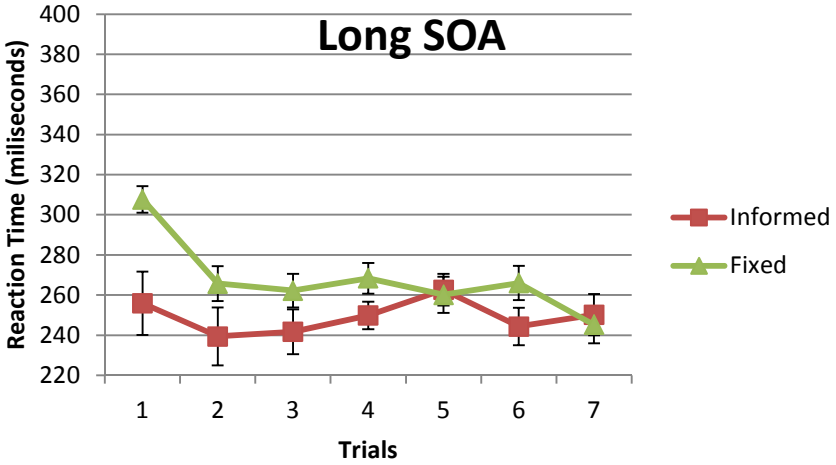


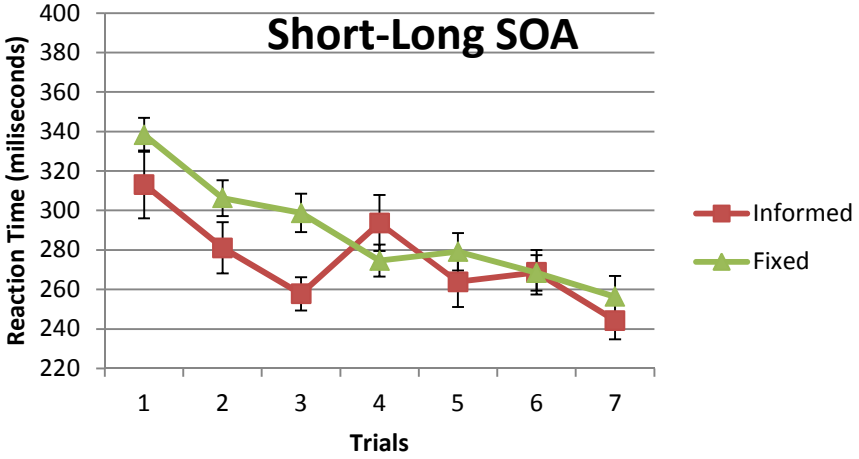




Group, F(2, 124,886) = 9,176, $p < .001$
Cue, F(2, 2171,415) = 67,812, $p < .001$
Trial, F(2, 2172,502) = 30,309, $p < .001$
Group*Cue, F(4, 2171,406) = 2,907, $p = .021$
Group*Trial, F(12, 2172,466) = 2,537, $p = .003$
Cue*Trial, F(12, 2171,496) = 2,414, $p = .004$







Informed vs Fixed cues

Short SOA

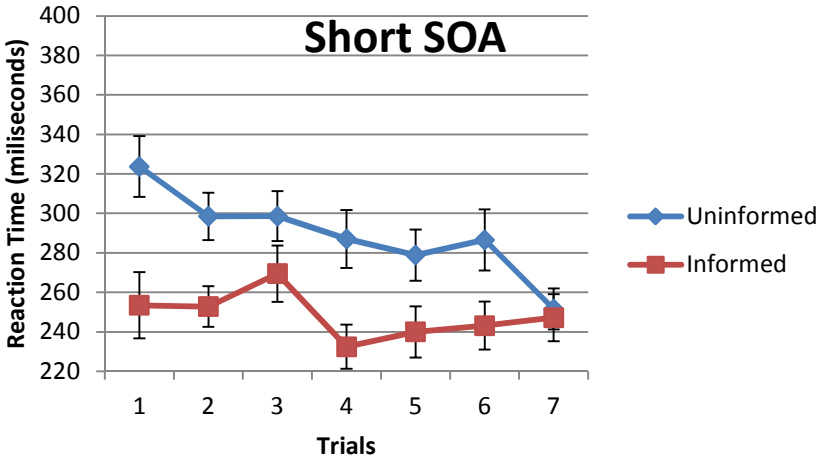
Cue F(1, 488,005) = 1,197, p = .274

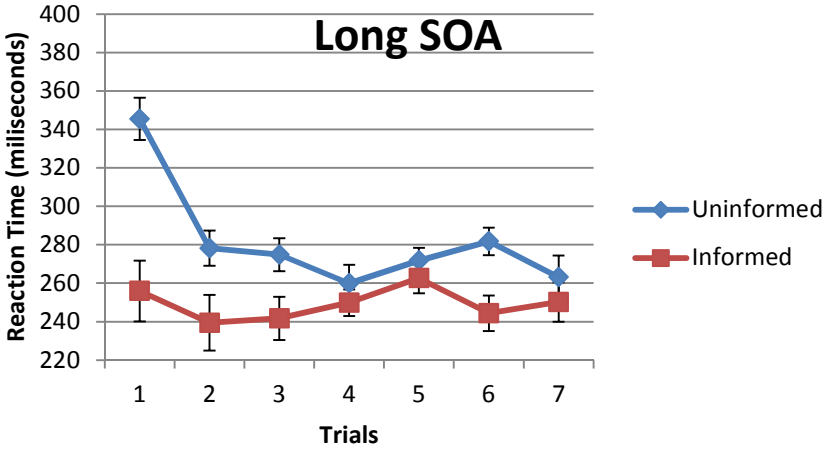
Long SOA

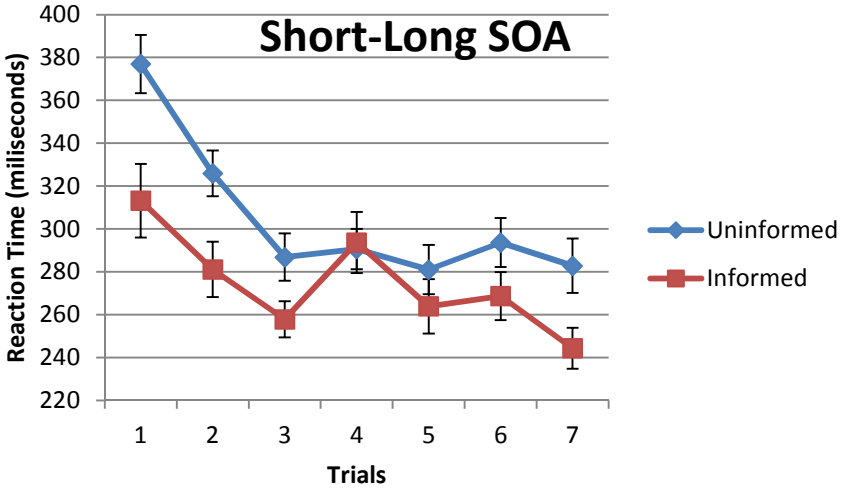
Cue, F (1, 480,053) = 17,389, p < .001
Trial, F (6, 479,469) = 3,347, p = 003
Trial*Cue, F (6, 479,677) = 2,214, p = .041

Short-Long SOA

Cue, F (1, 470,525) = 7,497, p = .006
Trial, F (6, 471,935) = 11,060, p < .000







Uninformed vs Informed cues

Short Soa

Cue F (1, 431,521) = 43,037, p < .001,
Trial F (6, 432,981) = 2,702, p = 014.

Long SOA

Cue F (1, 449,926) = 41,841 p < .001
Trial F (6, 449,045) = 5,040, p < 001
Trial*Cue, F (6, 449,264) = 3,564, p = .002

Short-Long SOA

Cue F (1, 483,221) = 13,750, p <.001
Trial F (6, 483,437) = 20,768, p < .001

Tentative conclusions

- Overall, the pattern of results is not completely consistent with the propositional or the dual process account.

- Differences between uninformed and informed cues persisted across a greater number of trials in the Short SOA than in the Long SOA group.

- Though unexpected, the different performance for fixed cues in the Short SOA group may be better understood in automatic terms.

THE END