

Introduction

- Reward, goals, and motivation affect attentional selection.^{1, 2, 3, 4, 5}
- The mechanism of selection is flexible, accurate, and efficient at incorporating these various influences for the purpose of attentional guidance.

Visuo-spatial Neglect

- Neglect is a neurological disorder, characterized by a deficit of attention to the left side, most often accompanied by damage to the right parietal lobe.
- Current treatments are neither effective nor long-lasting.
- Patients are sensitive to implicit target contingencies in search.⁶
- What we don't know is whether neglect precludes sensitivity to reward based attentional guidance.

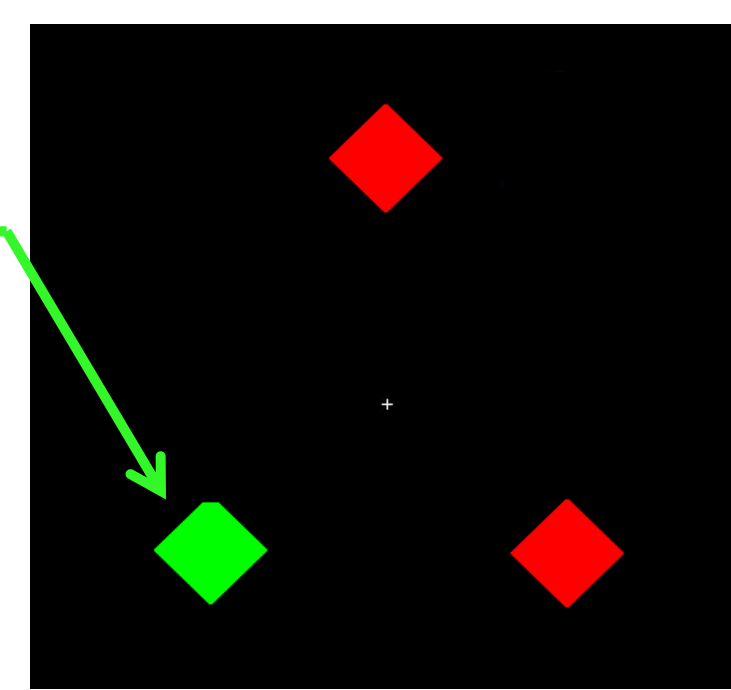
Purpose

- Does reward guide attention in patients with neglect?
- Is the effect of reward long-lasting?

Task

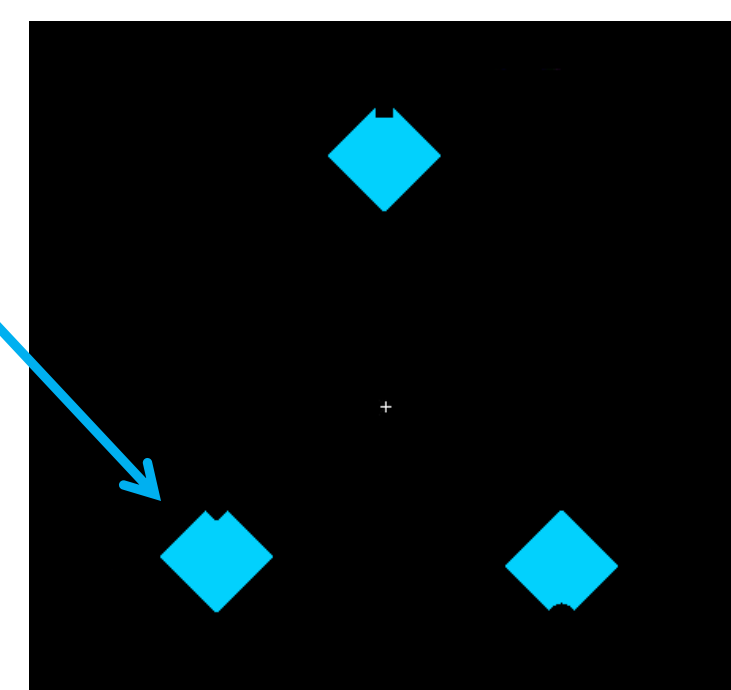
Bottom-up

- Find pop-out color.
- Target location: 33% at each.
- Reward: 85% high (+10) to highly rewarded color or location.
- Response: top or bottom notch.



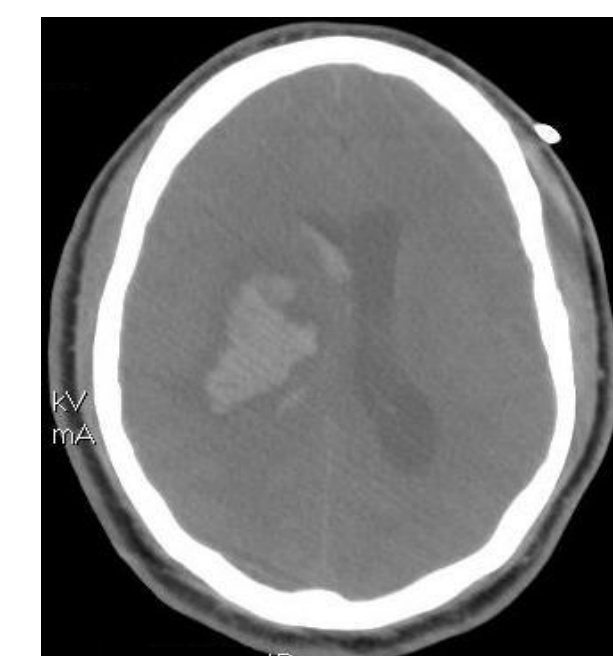
Top-down

- Find shape as determined by color (yellow = circle, blue = triangle).
- Target location: 33% at each.
- Reward: 85% high (+10) to highly rewarded shape or location.
- Response: top or bottom notch.



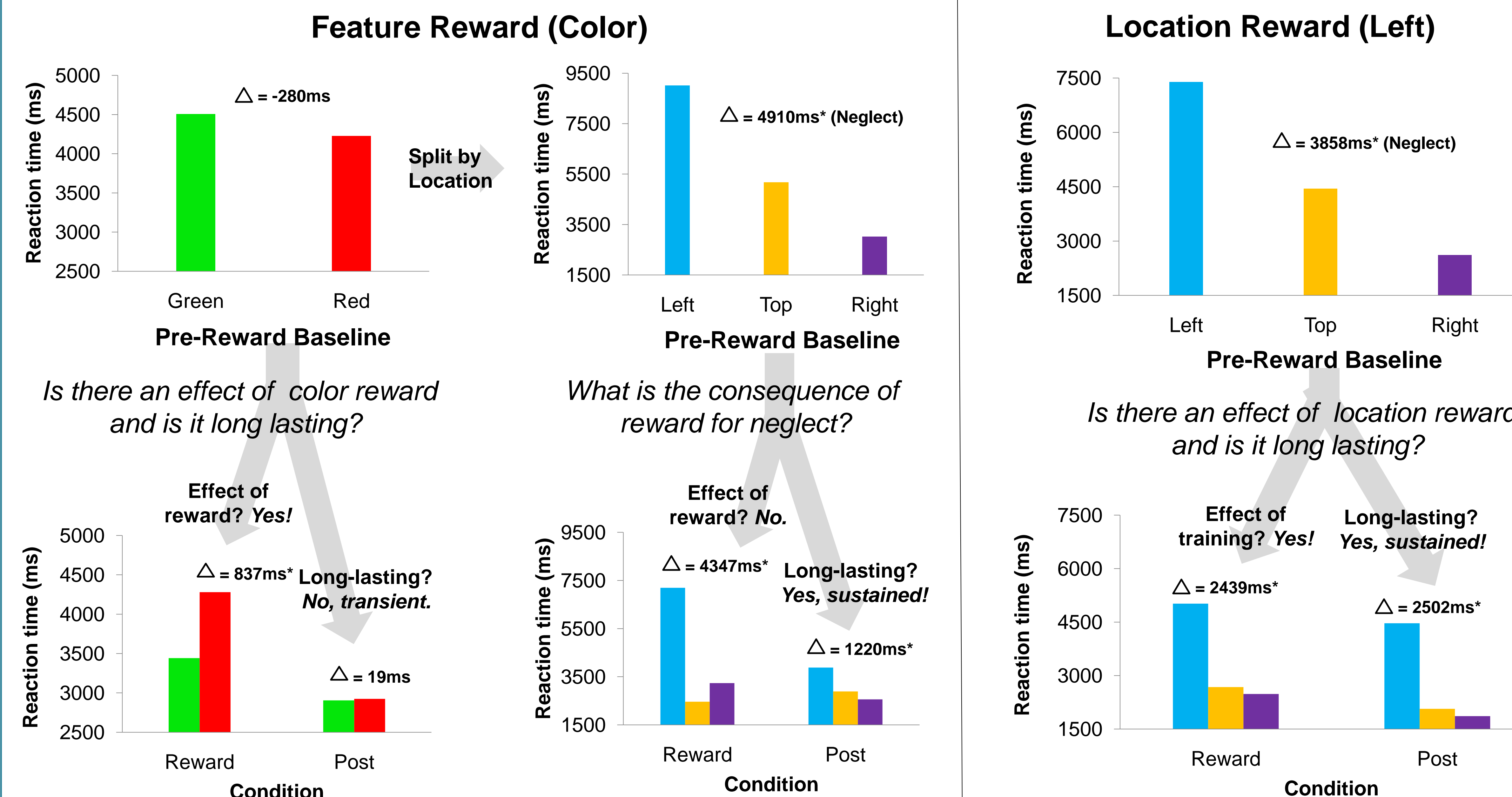
Participants

- 86 Controls
- Patient C.P. with severe neglect

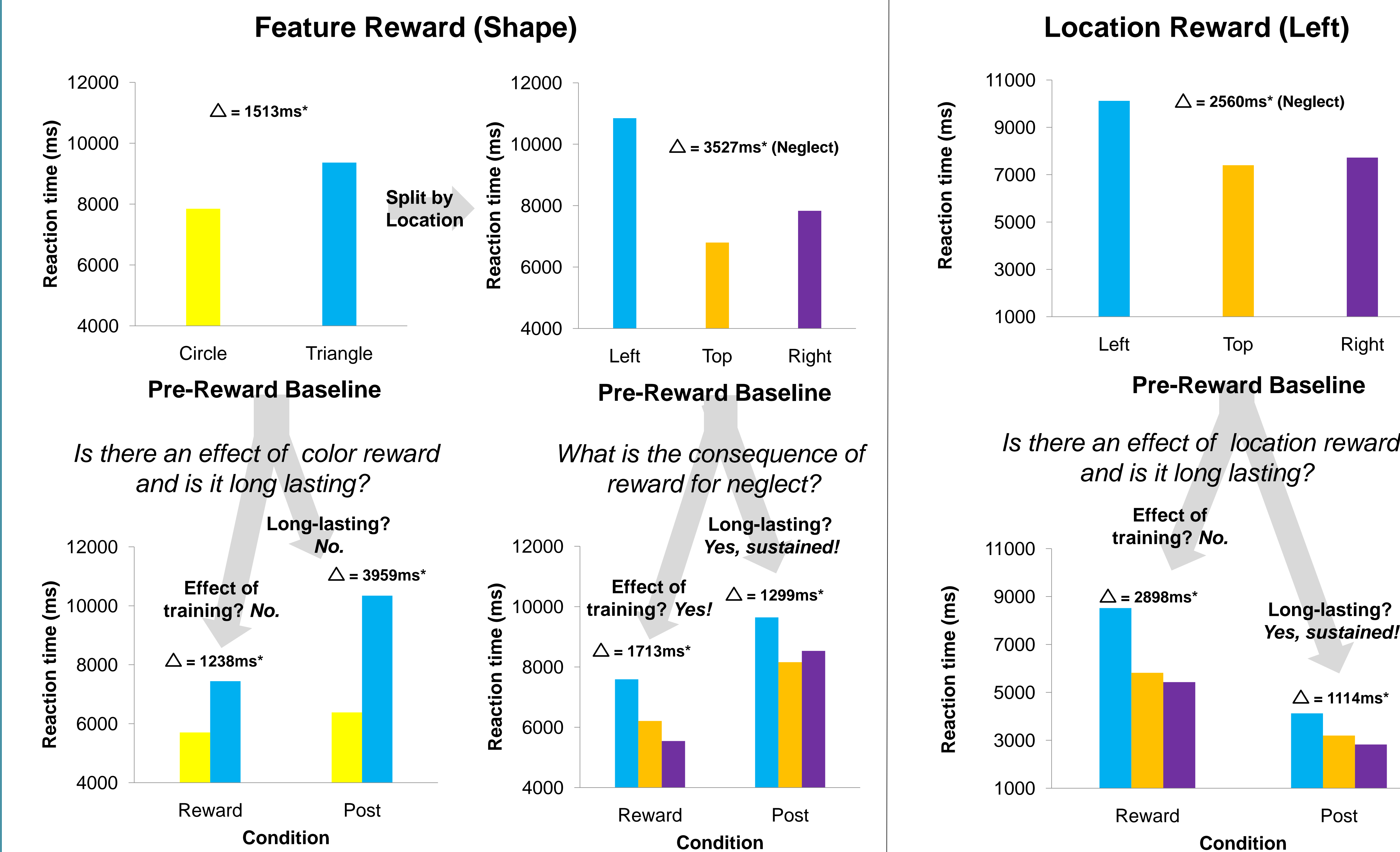


Method & Results

Bottom-Up Search



Top-Down Search



Summary

Effect of Reward

	Bottom-up	Top-down
	Color	Left
Feature	✓	X
Location	--	✓

Long-lasting Effects

	Bottom-up	Top-down
	Color	Left
Feature	X	✓
Location	--	✓

Faster RT for bottom-up highly rewarded color and left side.

Faster RT for left side when color was rewarded and for highly rewarded left side in both bottom-up and top-down.

Faster RT for top-down left side when color was the focus of reward.

Conclusions

During reward training:

- C.P. is sensitive to reward manipulation in top-down and bottom-up orienting for both locations and features.

After training (i.e., reward structure removed):

- Neither color nor shape, in either top-down or bottom-up orienting, receive a long-lasting benefit of reward.
- However, there are carry-over effects for both the left side in the highly rewarded feature condition and for the highly rewarded location condition in both top-down and bottom up orienting.

These findings demonstrate that patients with neglect:

- Are sensitive to reward structure,
- Improve their attentional orienting to the left side with reward training, thus reducing neglect (at least in the short-term),
- Might benefit from a reward-based rehabilitation tool.

References

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