



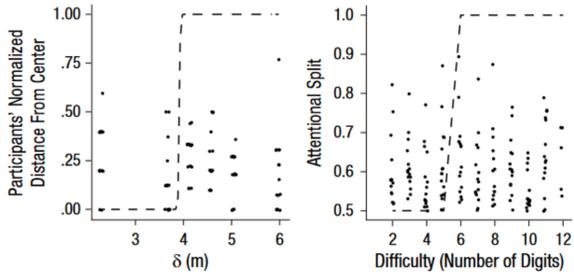
# Uncertainty influences choices to invest in a single goal or divide resources between two goals

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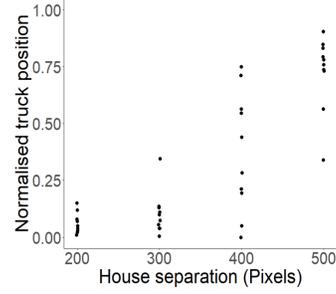
## Background

Previous focus-divide dilemma findings<sup>1</sup>

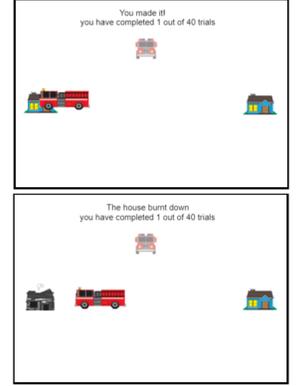
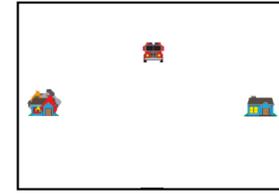


A failure to adjust strategy with difficulty

New version: The firetrucks task



Adjusting strategy with difficulty



The firetrucks task: participants have to position a firetruck between two houses which vary in separation. After they choose, one of the houses catches fire and the truck drives towards it

Why a difference?  
Agency — Task execution may distract participants from strategy<sup>1</sup>, and the firetrucks task has no execution demand  
Uncertainty — Choice outcomes in previous versions<sup>2</sup> were uncertain, following a probability curve rather than a step function.

Key terms:  
the focus-divide dilemma: Preparing to complete two equally likely tasks which vary in difficulty

optimal strategy: focus when difficult, divide when easy

## Testing agency and uncertainty

figures shown for experiment 3, n=94

Experiments 1 and 2 summary

### Experiment 1:

- Tested whether framing mattered, abstract vs concrete – it made no difference
- Motivated experiments 2/3 – why are people better at this task?



### Experiment 2:

- Tested uncertainty and agency manipulations
- Uncertainty made decisions worse
- Agency made no difference



### Experiment 3:

#### Manipulation

Distance: Close vs Far

If participants approach the optimal strategy, they should adjust the position of the truck with distance.

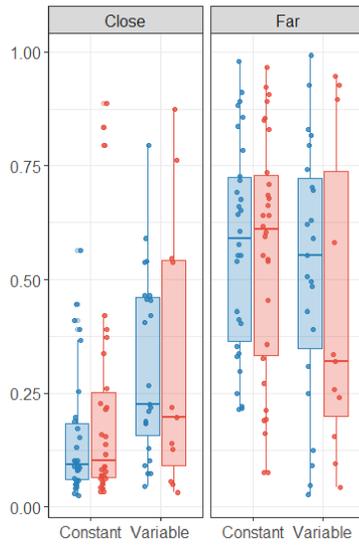
Agency: Automatic vs Manual

We tested agency by adding control over the motion of the truck (same as 2, but more complex). If agency makes people worse, they should adjust position less with distance.

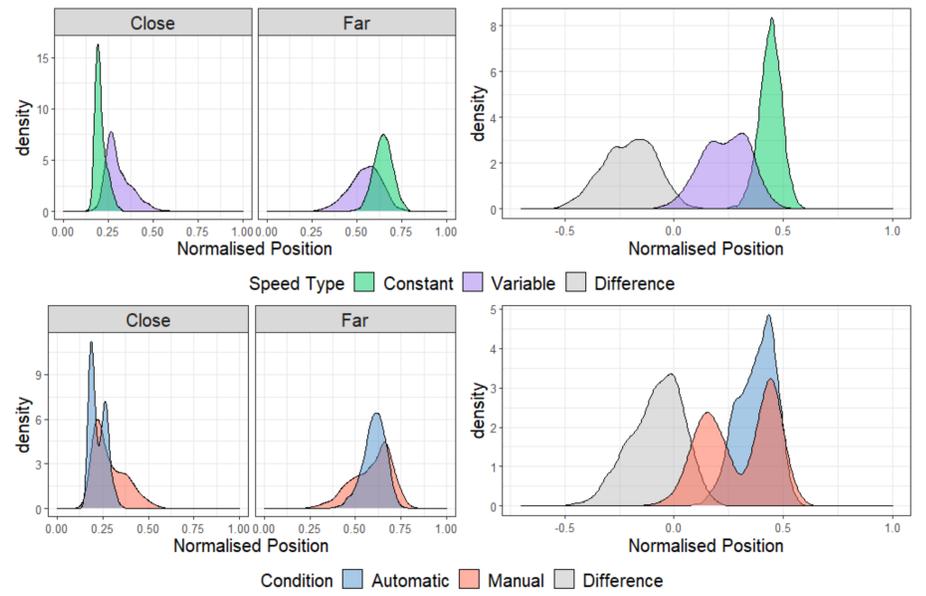
Uncertainty: Constant vs Variable

We tested the effect of uncertainty by making the speed of the truck variable or constant.

Summary boxplot



Effect of agency and uncertainty on adjustment with distance



#### Result

Participants placed the truck closer to one of the target house when far (Same as 1/2). That is, they approached the optimal strategy.

Agency did not influence adjustment with distance (same as 2). Making the driving more complex did not move participants away from optimal.

Participants adjusted position less with distance when truck motion was variable. That is, they were further from optimal when choice outcomes were uncertain.

## Conclusions

➤ Agency does not influence strategy, it does not account for the difference between the firetrucks task and previous versions

➤ Uncertainty makes decisions worse, even though the optimal strategy does not differ, consistent with the pattern of results in previous research<sup>1</sup> indicating that uncertainty underlies the difference between tasks in which participants are optimal vs suboptimal

## References

1: James, W. R. G., Reuther, J., Angus, E., Clarke, A. D. F., & Hunt, A. R. (2019). Inefficient eye movements: Gamification improves task execution, but not fixation strategy. *Vision*, 3(3), 48.  
2: Clarke, A. D. F., & Hunt, A. R. (2016). Failure of Intuition When Choosing Whether to Invest in a Single Goal or Split Resources Between Two Goals. *Psychological Science*, 27(1), 64–74.